Title

Occupational advice for Patients undergoing Arthroplasty of the Lower limb: An intervention development and feasibility study (The OPAL Study)

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Abstract

Background
Hip and knee replacements are regularly performed for patients who work. There is little evidence about these patients' needs and the factors influencing their return to work. There is a paucity of guidance to help patients return to work after surgery and a need for structured occupational advice to enable them to return to work safely and effectively.

Objective(s)
To develop an occupational advice intervention to support early recovery to usual activities including work which is tailored to the requirements of patients undergoing hip and knee replacements. To test the acceptability, practicality and feasibility of this intervention within current care frameworks

Design
An intervention mapping (IM) approach was used to develop the intervention. The research methods employed were: rapid evidence synthesis; qualitative interviews with patients and stakeholders; prospective cohort study; survey of clinical practice; modified Delphi consensus process. The developed intervention was implemented and assessed during the final feasibility stage of the IM process.

Setting
Orthopaedic departments within NHS secondary care.

Participants
Patients in work, and intending to return to work following primary elective hip and knee replacement surgery; healthcare professionals and employers.

Interventions
Occupational advice intervention.

Main outcome measures
Development of an occupational advice intervention. Fidelity of the developed intervention when delivered in a clinical setting. Patient and clinician perspectives of the intervention. Preliminary assessments of intervention effectiveness and cost.

Results
A cohort study (154 patients), 110 stakeholder interviews, survey of practice (152 respondents) and evidence synthesis provided the necessary information to develop the intervention. The intervention included information resources, personalized return to work plan and co-ordination from the healthcare team to support the delivery of 13 patient and 20 staff performance objectives (POs). To support delivery, a range of tools (e.g. occupational checklists, patient workbooks, employer information), roles (e.g. return-to-work coordinator) and training resources were created. Feasibility was assessed in 21 of the 26 patients recruited from 3 NHS trusts. Adherence with the defined performance objectives was 75% for patient POs and 74% for staff POs. The intervention was generally well received although the short timeframe available for implementation and concurrent research evaluation led to some confusion amongst patients and those delivering the intervention regarding its purpose and the roles and responsibilities of key staff.

Limitations
Implementation and uptake of the intervention was not standardized and was limited by the study timeframe. Evaluation of the intervention involved a small number of patients which limited the ability to assess it.

Conclusions
The developed occupational advice intervention supports best practice. Evaluation demonstrated good rates of adherence against defined performance objectives. However, a number of operational and implementation issues require further attention

Future work
The intervention warrants a randomised controlled trial to assess its clinical and cost effectiveness to improve rates and timing of sustained return to work after surgery. This research should include the development of a robust implementation strategy to ensure adoption is sustained.

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List of Abbreviations

AHP	Allied Health Professional (Physiotherapist or Occupational therapist)
AMSTAR	Assessing the Methodological Quality of Systematic Reviews
BASK	British Association for Surgery of the Knee
BHS	British Hip Society
BOA	British Orthopaedic Association
CASP	Critical Appraisal Skills Programme
DVT	Deep Vein Thrombosis
EQ-5D 5L	EuroQol - 5 Dimension - 5 Level Scale
GCP	Good Clinical Practice
GP	General Practitioner
HOT	Hospital Orthopaedic Team
HSE	Health and Safety Executive
HRA	Health Research Authority
HTA	Health Technology Assessment
IM	Intervention mapping
IRAS	Integrated Research Application System
ITT	Intention to Treat
MRC	Medical Research Council
NHS	National Health Service
NICE	National Institute for Heath and Care Excellence
NIHR	National Institute for Health Research
NJR	National Joint Registry for England, Wales Northern Ireland and the Isle of Man
ODI	Oswestry Disability Index
OHS	Oxford Hip Score
OKS	Oxford Knee Score
OPAL	Occupation advice for Patients undergoing Arthroplasty of the Lower limb
PI	Principal Investigator
PO	Performance Objective
PPI	Patient and Public Involvement
PROSPERO	International prospective register of systematic reviews
QoL	Quality of Life
RCT	Randomised Controlled Trial
REC	Research Ethics Committee
ROBINS-I	Risk of Bias in Non-Randomised Studies of Interventions
RTW	Return to work
RTWC	Return to work co-ordinator
THR	Total Hip Replacement
TKR	Total Knee Replacement
UK	United Kingdom
USA	United States of America
WALS	Workplace Activity Limitations Scale
WLQ	Work Limitations Questionnaire
WDQ	Workplace Design Questionnaire

Plain English Summary

Hip and knee replacements are regularly performed for patients that work. There is a lack of evidence about these patients' needs and how they return to work. Guidance to enable return to work after surgery is limited. There is therefore a need for structured occupational advice to help these patients.

The aim of this project was to develop a multidisciplinary occupational advice intervention for this patient population and assess if it could be delivered. The study also aimed to make recommendations about its further assessment within a clinical trial.

The study combined different methods of research (quantitative and qualitative) to identify the population likely to benefit; their current care; and outcomes important to patients and healthcare professionals. All the information gathered was mapped through a framework (intervention mapping (IM)), that included a consensus process with stakeholders to develop the intervention. The intervention delivery was assessed for a small number of patients across orthopaedic departments, employer organisations and primary care networks.

The study included 154 patients, 110 stakeholders (GPs, Surgeons, Employers, Health Professionals/Nurses), and a survey of current care (152 respondents) to develop the intervention. The intervention included information resources, a personalized return to work plan and co-ordination from the healthcare team to support the delivery of 33 patient and staff performance objectives (POs). To support delivery, a range of tools (e.g. occupational checklists, patient workbooks, employer information), roles (e.g. return-to-work coordinator) and training resources were created. The intervention was assessed in 26 patients and staff, and showed high rates of adherence with the defined POs.

The overall results demonstrated the occupational advice intervention developed for hip and knee replacement patients is deliverable. The intervention warrants further research to assess its clinical and cost effectiveness as a tool to improve rates and timing of sustained return to work after surgery.

299 Words

Scientific Summary

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Background

Hip and knee replacements are regularly performed for patients who work. There is little evidence about these patients' needs and the factors influencing their return to work (RTW). There is a paucity of guidance to help patients return to work after surgery and a need for structured occupational advice to enable them to return safely and effectively. There is variation in the occupational advice provided as part of standard care and the content, format and delivery of this information is poorly understood. The appropriateness of individual return to work outcomes for use as primary outcome measures in research is currently unclear.

Objectives

The OPAL study had 9 objectives:

1. To evaluate the specific needs of the population of patients who are in work and intend to return to work following hip and knee replacement.
2. To establish how individual patients return to work; the role of fit notes, clinical and workplace-based interventions, and how specific job demands influence workplace disability and productivity.
3. To establish what evidence is currently available relating to return to work/occupational advice interventions following elective surgical procedures.
4. To understand the barriers preventing return to work which need to be addressed by an occupational advice intervention.
5. To determine current models of delivering occupational advice; the nature and extent of the advice offered; and how tools to facilitate return to work are being currently used.
6. To define a suitable measure of return to work through systematic review and evaluation of specific measures of activity, social participation and including specific validated workplace questionnaires.
7. To construct a multi-stakeholder intervention development group to inform the design and establish the necessary components of an evidenced based occupational advice intervention initiated prior to elective lower limb joint replacement.
8. To develop and manualise a multidisciplinary occupational advice intervention tailored to the needs of this patient group.
9. To test the acceptability, practicality and feasibility and potential cost of delivering the manualised intervention within current care frameworks and as a potential trial intervention.

Methods

A 6-stage Intervention Mapping (IM) approach was employed. Stages 1-3 addressed objectives 1-6 by gathering data on current practice and barriers to change; it also provided a theoretical framework for intervention development. Stages 4-6 addressed objectives 7-9.

IM Stage 1: Needs assessment

IM Stage 1 established the rationale for an occupational advice intervention within the target population by evaluating the discrepancy between current and desired practice.

It included the following complimentary work-streams:

- ***Rapid evidence synthesis:*** Review of existing quantitative and qualitative evidence on occupational advice interventions for people undergoing elective surgery. Review of systematic

reviews evaluating occupational advice interventions supporting return to work for individuals with chronic musculoskeletal problems.

- ***Prospective cohort study:*** Participants undergoing hip or knee replacement, working in the 6 months prior to surgery, were prospectively recruited from four NHS sites. Questionnaire assessment at baseline, 8 and 16 weeks (and 24 weeks for a subset of participants) was undertaken and measured patient characteristics, employment details, workplace assessments, functional outcomes, health utility measures, expectations of recovery, and rates and timing of return to work after surgery. Questionnaire data was summarised using descriptive statistics. Logistic regression models were used to predict early return to work (within 6 weeks) using preoperative, operative and postoperative characteristics. Health economic analyses were conducted using estimates of health care resource use, time spent delivering return to work advice, health related quality of life measures and productivity loss.

- ***National survey of practice:*** Web-based survey of current practice was sent to hospital orthopaedic departments in England, Wales, Scotland and Northern Ireland.

- ***Patient interviews:*** Interviews were conducted with a subset of patients from the cohort study approximately 16 weeks post-surgery. A framework approach was used to design semi-structured interviews and analyse data. Thematic analysis reflected an essentialist/realist perspective, reporting on the experiences, meanings and reality of the participants.

- ***Stakeholder interviews:*** Patient interviews were supplemented by qualitative data from semi-structured stakeholder interviews. Employer, surgeon, GP, AHP and nurse interviews were conducted.

Information from these work-streams was used to create a logic model of the problem. Behavioural and environmental factors were mapped to specific theory and evidence-based factors and determinants to provide an overview of the problem and a framework to address it.

IM Stage 2: Identify intended outcomes and performance objectives
Stage 2 specified who and/or what needed to change in order for patients to make a successful return to work following hip/knee replacement. A matrix of performance objectives for key stakeholder groups was constructed.

IM Stage 3: Selecting theory-based methods and practical strategies
Stage 3 generated a list of possible intervention components matched to each performance objective/determinant.

IM Stage 4: Development of intervention components
Stage 4 developed specific tailored tools and materials to facilitate the intervention. To refine these components, a multi-stakeholder intervention development group was created to reach agreement about the design, content, delivery, format and timing of the proposed occupational advice intervention. To facilitate this process a modified three round Delphi consensus process was employed.

IM Stage 5: Adoption and implementation plan
Stage 5 developed an implementation and adoption strategy. It focussed on the delivery of the intervention within the realities of the NHS. To facilitate the implementation and adoption of the intervention, education and training materials were developed for each of the staff groups involved in its delivery.

IM Stage 6: Evaluation plan and feasibility testing

The final stage evaluated the intervention by assessing four complimentary aspects of its delivery and performance.

- Intervention fidelity
- Intervention quality
- Feasibility data
- Economic data

Feasibility testing involved a further cohort study, including health economic analyses, and patient and stakeholder interviews.

Results

Data from IM Stage 1 provided the necessary information to develop the intervention:

- ***Rapid evidence synthesis:*** Four primary papers (2 quantitative and 2 qualitative) and 17 systematic reviews were assessed. They identified six key components effective across previous RTW interventions:
    - Work simulation, work hardening and job accommodation
    - Contact with employer/workplace visits
    - Physical exercise/therapy
    - Educational programs
    - Vocational counselling and guidance
    - Multidisciplinary team involvement

- ***Prospective cohort study:*** 765 patients screened of which 202 (27%) were eligible for inclusion. 154 patients consented and provided baseline data (77 hips and 77 knees). 78 participants (50.6%, 37 hip and 41 knee) returned to work within their period of follow-up. On average, they returned at 10 weeks after surgery (range 1 to 27 weeks). At follow up, almost 10% (n=9) of respondents that stated they initially intended to RTW no longer planned to. Only 29% (n=44) of participants reported having access to occupational health services and 23% (n=36) stated they received advice about RTW after surgery. Regression models failed to determine predictors of RTW within the cohort. Health economic analysis found the mean cost associated with productivity loss prior to and following surgery was £7,983 (SD £4,301) per participant.

- ***National survey of practice:*** Responses were received from a total of 152 participants from 59 different public and private health providers and included 78 surgeons, 20 physiotherapists, 25 occupational therapists and 25 nurse/specialist nurse/extended scope practitioners. Only 20% (n=30) of healthcare professionals reported that RTW patients were identified as a specific group in need of additional support and information during their care episode and 18% (n=26) stated that they received additional advice and support. When advice on RTW was given, it typically was verbal ad-hoc advice using generic time scales and based on the healthcare providers anecdotal experience. Overall 78% of respondents (n=116) felt an occupational advice intervention was needed.

- ***Patient interviews:*** Interviews were conducted with 45 patients including 20 private sector employees, 16 public sector employees, 6 self-employed participants and 3 participants in unpaid work or carer roles. The interviews identified the following themes:
    - Pre-operative context
    - Post-operative context
    - Advice received
    - GP role and fit note
    - Barriers and facilitators to return to work
    - Perceptions of an occupational advice intervention

- ***Stakeholder interviews:*** Interviews were conducted with 25 workplace representatives, 12 orthopaedic surgeons, 16 GPs and 12 AHPs/nurses. The interviews identified the following themes:

  Workplace representatives
  - Experiences of accommodating patients undergoing hip and knee replacement in the workplace
  - Barriers and facilitators to return to work
  - Perceptions regarding an occupational advice intervention

  Clinicians
  - Decision to have surgery and expectations of recovery
  - Advising patients about work and other activities
  - Barriers and facilitators to return to work
  - Perceptions regarding an occupational advice intervention

A logic model of the problem was created based on the information gathered from the needs assessment in Stage 1. Stages 2 and 3 then developed provisional performance objectives (PO) for the occupational advice intervention and selected theory-based methods and practical strategies to support their development. Determinants for the behavioural outcomes of both patients and hospital staff were examined allowing a logic model of change to be created that illustrated the proposed causal relations between theory- and evidence-based change methods, the determinants they are expected to influence, and behavioural plus environmental outcomes that will address the health problem.

In IM Stage 4 a multi-stakeholder intervention development group finalised the content, delivery, format and timing of the proposed occupational advice intervention. A modified 3-round Delphi consensus process facilitated this process. 66 stakeholders (patients, employers, surgeons, GPs, AHPs and nurses) were invited to participate. In Round 1, statements relating to the content of the intervention were considered by 43 respondents. In Round 2, statements relating to the delivery, format and timing of the intervention were considered by 26 participants. In Round 3 the developed intervention was circulated for comments with responses from 11 participants that constructively appraised the intervention.

The final intervention comprised 13 patient and 20 staff performance objectives (POs) and had the following key features:

- **TIMING:** Commenced in the outpatient clinic when listed for surgery and continued until 16 weeks after surgery.
- **PATIENT IDENTIFICATION: All RTW patients** identified as RTW patients at their initial clinic appointment. An occupational checklist facilitated identification of these patients. Information on the *occupational checklist* was used to aid surgical decision-making. Patients subsequently listed for surgery were signposted to the OPAL intervention resources (*OPAL patient 'return to work' workbook, employer information resource, website, and local return to work co-ordinator*) by their surgical team.
- **DELIVERY OF INFORMATION:** All patients in work and intending to return to work after surgery were provided with the following resources:
  - *The patient 'return to work' workbook*. An 8 step interactive workbook. Completion of the workbook helped patients to list and understand their current job demands, set a provisional return to work date, identify potential barriers and solutions to safe and appropriate return to work and develop a provisional return to work plan that could be shared with their employer/work colleagues. The completion was overseen by a designated 'return to work' co-ordinator who was a member of the orthopaedic team.

    - *The employer 'return to work' information resource*. This mirrored the information in the patient workbook. The patient was provided a copy to give to their employer.
    - Signposting to the *OPAL website*
- **ASSESSMENT BY A DESIGNATED MEMBER OF THE ORTHOPAEDIC TEAM:** All patients were contacted by a *'return to work' co-ordinator* (RTWC) prior to surgery. The *'return to work' co-ordinator* offered support to patients, encouraged them to complete the *patient 'return to work' workbook* and discussed the plans they have developed. This contact occurred at a minimum of 4 weeks prior to surgery.
- **SUPPORT, REVIEW and ESCALATION:** The *'return to work' co-ordinator* offered additional support to patients based on need. A dedicated mechanism for contacting the RTWC was created (Phone or email) which could prompt further review and referral back in to local therapy services.
- **COMMUNICATION:** Mechanisms and guidance to support communication within the hospital team, between the hospital team and primary care and between the patient and their employer were included.
- **TRAINING:** Training for members of the hospital orthopaedic care team who interact with 'return to work' patients to increase awareness of return to work issues across the orthopaedic department was provided.

To support delivery, a range of tools (e.g. occupational checklists, patient workbooks, and employer information), roles (e.g. return-to-work coordinator) and training resources were created.

IM Stages 5 and 6 implemented and assessed the intervention within 3 NHS trusts. Of 147 patients screened, 35 (24%) were eligible (in work and intending to RTW after surgery) and 26 consented to participate. Baseline data was available for all 26 patients, however follow up data was only available for 21 as two withdrew and three had their surgery transferred to another site or deferred to a later date. Adherence with the defined performance objectives (POs) was 75% for patient POs and 74% for staff POs. The intervention was generally well received although the short timeframe for implementation and concurrent research evaluation led to some confusion regarding its purpose and the roles and responsibilities of key staff. At 16 weeks, 10 of the 21 respondents had RTW at an average of 7.4 weeks. In the case of those not back at work, the readiness for RTW scale indicated that participants wanted to get back to work, thought it was possible, and were working towards achieving it. The estimated total cost of the intervention was £70.52 per patient.

Conclusions

The OPAL study collected a wide range of data and perspectives about RTW from a variety of stakeholders across a number of NHS sites. It provided essential relevant information about the target population, delivery of usual care and explored outcomes of importance for this patient group. Importantly, it produced an occupational advice intervention that supports best practice through the development of an individualised return to work plan, tailored to the patients' needs and which involves them in decisions about their care. Subsequent evaluation demonstrated good rates of adherence against defined performance objectives. However, implementation and uptake of the intervention were not standardized and were limited by the study timeframe. These aspects and other operational issues require further attention before the intervention is more widely adopted.

Future work

The intervention warrants further research to assess its clinical and cost effectiveness to improve rates and timing of sustained return to work after surgery. This research should include the development of a robust implementation strategy to ensure adoption is sustained.

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Chapter 1: Background and Study Introduction

1.1 Is there a need for an occupational advice intervention for hip and knee replacement patients?

The impact of hip and knee osteoarthritis on employment

Decreased physical function associated with hip and knee osteoarthritis reduces the likelihood of employment, reduces household income and increases missed workdays for those who are employed[1] . The magnitude of the impact varies dependent upon the degree of activity limitation and disease severity[2] . A diagnosis of hip or knee osteoarthritis is associated with a reduction in work participation and productivity and an increased risk of work loss[3, 4]. In a national study of patients in Finland, Kontio *et al* (2019)[5] found the age adjusted incidence of disability retirement due to knee osteoarthritis was 60 and 72 per 100,000-person years for men and women respectively. The highest rates of disability retirement in men were found in construction workers, electricians and plumbers while in women it was found in building caretakers, cleaners, nurses and kitchen workers[5].

The cost of work related musculoskeletal disorders that impact on a person's ability to work is difficult to quantify. Direct (the cost of treatment) and indirect (costs related to the impact of the period ill health) costs are borne by the individual (impact of ill health on quality of life), employers and society (loss of productivity, need for health care, rehabilitation and compensation)[6, 7]. The Health and Safety Executive (HSE) calculates the annual cost of workplace injury and ill-health on this basis by estimating both the financial and the 'human' cost[7, 8]. They estimate that the total annual cost of workplace ill health due to musculoskeletal disorders is £9.7 billion, equivalent to £18,400 per case[7, 8]. However these figures do not take account of non-work related injuries and ill health and therefore are likely to be an underestimate of the total cost. In addition to its financial benefits, working has significant physical, mental and emotional health benefits[9-11]. Loss of employment is associated with a reduction in physical function, increased anxiety and depression and increased risk of mortality[12, 13]. Earlier return to work therefore has potential health as well as socioeconomic benefits.

The role of lower limb joint replacement in patients of working age

Lower limb joint replacements are successful and cost-effective treatments that relieve pain, restore physical function and improve health related quality of life for patients with hip and knee arthritis[14-17]. Currently over one million hip and knee replacements are performed annually in the United States and over 190,000 in England, Wales and Northern Ireland[18] . Projections from 2005 suggest that by 2030, the number of primary total hip (THR) and knee (TKR) replacements performed will increase by 174% and 673% respectively[19] .

Recent changes to the state pension age, combined with an ageing UK workforce, has resulted in a steady increase in the numbers of hip and knee replacements being performed in patients of working age over the last decade[18] . These changes are also reflected in data from North America which suggest that over half of all hip and knee replacement procedures will be performed in patients aged under 65 years by 2030[19]. International estimates suggest that between 15 and 45% of patients undergoing either hip or knee replacements are of working age[20, 21] .

According to data published by the National Joint Registry for England, Wales and Northern Ireland 106,334 primary knee replacements[22] and 96,717 primary hip replacements[23] were performed in 2017. Of the 91,923 hip replacement patients with available patient data 18,812 (20.5%) were aged under 60 years (9,778 Females: 9,034 Males) and a further 26,295 (28.6%; 15,375 Females: 10,920 Males) were aged 60-69 years. Of the 102,347 knee replacement patients with available patient data 17,765 (17.4%) were aged under 60 years (10,259 Females: 7,506 Males) and a further 33,523 (32.8%; 18,161 Females: 15,362 Males) were aged 60-69 years.

Occupational advice for patients undergoing hip and knee replacement

There is currently a paucity of information and guidance to support patients returning to work after hip and knee replacement. Over the last two years (during the course of the OPAL study) the Royal College of Surgeons of England has produced written information resources to guide recovery including return to work after both hip and knee replacement (example information available at https://www.rcseng.ac.uk/patients/recovering-from-surgery/total-hip-replacement/returning-to-work). However, we are not aware of any other currently available occupational advice or information resources specifically tailored to this patient group.

The UK government currently fund the 'Fit for work' service (in Scotland the service is called 'Fit for work Scotland')[24]. This initiative is free for the public to use and is designed to support people in work with health conditions and help with sickness absence. It works alongside existing occupational health services and employer sickness absence policies. Patients can access this service via phone line support, by visiting the 'Fit for work' websites or emailing the team. However, the patient-facing materials are generic and there is no specific information for hip or knee replacement patients[24] .

1.2 Current evidence relating to return to work after hip and knee replacement

Two systematic reviews examined work status, time to return to work and determinants of return to work in patients undergoing hip and knee replacement[20, 21].

The most recent and comprehensive review performed by Tilbury el al[20] identified 19 articles, 14 relating to hip replacements, 4 on knee replacements and 1 on both[25-43]. All were cohort studies of either prospective (8 studies) or retrospective (11 studies) design and included the 3 studies from the earlier Kuijer review[21]. Four of the included studies were from the UK[38-41]. Within these 19 studies there was significant variation in the definition of work status both before and after surgery[20] . The proportion of patients returning to work ranged from 25-95% at between 1 and 12 months after hip replacement and from 71-83% at 3-6 months after knee replacement[20]. Time to return to work ranged from 1.1 to 10.5 weeks after hip replacement and from 8 to 12 weeks after knee replacement[20] . Determinants of a worse 'work outcome' after hip replacement included female gender, older age, pain in other joints, failure of the procedure, employment involving physical work, unskilled work and being a farmer[29, 32, 35]. Better work outcomes after hip replacement were associated with younger age, a higher level of education, working within 1 month of surgery, primary osteoarthritis and earlier return of walking ability[29, 32, 35]. Determinants of a faster return to work after knee replacement included female gender, self-employment, better post-operative physical and mental health scores, a higher functional comorbidity index and a handicap accessible workplace[42] . Slower return to work was associated with the level of pre-operative pain, a physically demanding job and being on worker's compensation[42].

Of the work published in the UK, Mobasheri *et al*[38] studied 86 hip replacement patients aged less than 60 years, at a mean of 3 years after surgery of whom 51 were in work prior to surgery. After surgery 49 patients (96%) returned to work and an additional 13 gained employment[38]. In a similar study Lyall *et al*[40] examined 56 knee replacement patients aged less than 60 years at a mean of 5 years after surgery. Overall 40 of 41 (98%) patients employed before their operation returned to their previous work but none of the patients not working prior to surgery found work after their operation. Both studies suggest high rates of return to work can be achieved in patients at mid-term follow up (3-5 years). Of the 285 hip replacement patients aged under 65 studied by Cowie *et al*[39]170 (71.1%) were working after their surgery and the mean time to return to work was 13.9 weeks. Of those that returned to work 132 (78.1%) did so without any workplace restrictions. They also found a negative correlation between time to return to work and increasing age and Body Mass Index[39] . Finally, Foote *et al*[41] studied 109 patients aged less than 60 years at a mean of 3 years post-surgery

that had previously had either a total, unicondylar or patellofemoral knee replacement. The rate and time to return to work varied by the type of operation with the total knee replacement (82% RTW at median 12 weeks) and unicondylar (82% RTW at median 11 weeks) patients returning significantly sooner than the patellofemoral knee replacement patients (54% RTW at median 20 weeks)[41].

A number of additional studies examining return to work after hip and knee replacement have been published since these reviews.

Sankar *et al*[44] studied return to work in a cohort of Canadian patients and found that the rate of return to work varied dependent upon the joint replaced and the time since surgery. The proportion of patients returning to work was lower for knee replacement when compared to hip replacement at 1,3, and 6 months but by 12 months was equivalent (1 month: TKR 24%, THR 34%; 3 months: TKR 57%, THR 66%; 6 months: TKR 78%, THR 85%; 12 months TKR 85%, THR 87%)[44]. They also reported that the time taken to return to work was improved in males and in patients with a higher level of education and in less physically demanding jobs[44]. Dutch researchers have also examined the rate of return to work, duration until return to work and determinants of return to work in patients undergoing total hip or knee replacement[45, 46]. At 1 year post-surgery, 90% of hip and 83% of knee replacement patients had returned to work but 14% of the hip and 19% of the knee patients had returned to work on reduced hours[45]. The mean time to return to work was 12.5 (SD 7.6) and 12.9 (SD 8.0) weeks for hip and knee replacements, respectively[45]. Factors associated with a return to work included self-employment and better pre-operative activities of daily living (ADL) subscale scores[46]. Pre-operative absence from work reduced the chance of returning to work after surgery[46].

There have also been three recent publications from the UK[47-49]. Scott *et al*[47] retrospectively reviewed 289 total knee replacement patients aged <65 years at a mean of 3.4 years after surgery. Overall, 261 patients (90%) were working prior to surgery of whom 105 (40%) returned to work after surgery with 89 (34%) returning to the same job at a mean of 13.5 weeks post-operatively. Factors predictive of a successful return to work included younger age and type of work undertaken[47].

Malviya *et al* summarised the qualitative and quantitative literature for return to work after hip and knee replacement[48]. They found that patients have high expectations of the impact of joint replacement surgery on their ability to work and that unrealistic expectations lead to heightened frustration and slower rate of recovery, preventing them from returning to work. In this setting, supportive care from health care providers and family support after surgery were helpful in facilitating successful rehabilitation and satisfaction[48]. The same research team, Kleim *et al*[49], studied 83 patients undergoing hip and knee replacement who were employed prior to surgery. At review 80 patients had returned to work at median of 12 (2-64) weeks. They found that those patients in more manual occupations, those without pre-operative sick leave due to their hip or knee arthritis and patients with a higher level of qualification returned to employment significantly quicker than the rest of the cohort[49]. In addition hip replacement patients reported a greater improvement in terms of performance at work (63 versus 44%) and job prospects (50 versus 36%) as compared to patients after knee replacement[49].

1.3 Summary of the current literature – Key points

Current evidence suggests that:

- A substantial proportion of patients undergoing hip and knee replacement are of working age and the majority are in work at the time of surgery. This number is set to increase in an increasingly aged workforce who will have to work for longer due to changes in the state pension age.
- Lengthy sickness absence can impact negatively upon individual physical and mental health status.

- The cost associated with sickness absence to the patient, employer and the state is significant.
- Occupational advice interventions to support return to work after hip or knee replacement are limited.
- The extent to which return to work is 'full' and 'sustained' is not known
- Given the lack of occupational advice interventions and associated resources there is likely to be significant variation in the advice and information delivered to patients seeking to return to work after hip and knee replacement.
- Return to work is influenced by a range of patient, health process and employment factors.
- The underlying probability of employment varies by age, gender, education level, and other factors, meaning the economic implications of musculoskeletal limitations vary between patients and regions.

1.4 The OPAL study

In 2016 the NIHR Health Technology Assessment (HTA) program commissioned a research call that asked 'How feasible is a trial to evaluate whether occupational advice, initiated prior to planned surgery for major joint replacement within the lower limb, improves health outcomes in terms of faster recovery to usual activities, including work?'

Within the guidance the HTA described the need to develop a tailored occupational advice intervention that ensured targeted support and rehabilitation to facilitate return to work as part of this study. This intervention should be proactive and suitable for routine delivery in the NHS alongside the usual care pathway. There was also a requirement to define the population group, describe usual care and explore important outcome such as time to return to work, health related quality of life, healthcare utilisation and proportion of patients requiring workplace occupational health interventions.

Preliminary work undertaken by the OPAL investigators demonstrated a number of evidence gaps related to return to work after major lower limb joint replacement that directed the format and direction of the study. These included:

Population

- There is limited evidence about the population of patients undergoing hip and knee replacement that are in work and returning to work after surgery. Further information is required to understand the individualised workplace needs of this group including an understanding of how job classifications (e.g. manual versus non-manual); employment status (e.g. employed versus self-employed); the type of employer (e.g. small and medium enterprises versus large companies; public versus private or third sector employer); and how the presence of an occupational health service within the organisational structure influences the potential for early return to work.

  The target population for a clinical trial is therefore not clearly defined

Intervention

- Current recommendations guiding return to work are limited and inconsistent. Information is rarely individualised and generic information often fails to provide the patient, employers or health care teams with the advice required.
- The majority of patients undergoing hip and knee repla§cement undertake an integrated multi-disciplinary team (MDT) programme of education and rehabilitation spanning the surgical episode. The provision and utility of occupational advice within these 'usual care' pathways is not established and the ability of this service to facilitate return to work has not been explored.

- Studies suggested that the vast majority of 'fit notes' are not being used correctly. 'Fit notes' offer the patient and employer opportunities for early phased return to work. However, most are advising that patients are 'not fit' for work, with few doctors making use of the opportunity to advise on patient function and/or work modifications that might facilitate return to work after surgery[50, 51] .
- There is limited information about the impact of addressing modifiable barriers that prevent return to work or how modifiable psychosocial factors influence return to work behaviours and the specific needs of the patients regarding peri-operative care and advice[48, 52].

  There is therefore no appropriate occupational advice intervention available that could be used as the intervention in a clinical trial.

Comparison

- There is no information about how, when and who is delivering occupational advice to hip and knee replacement patients. The rapid and inconsistent adoption of enhanced recovery and early discharge pathways has led to variations in provision of perioperative care and advice.

  '**Standard care' is therefore not currently defined for use as a study comparator**

Outcome

- There is currently no standardised method of recording return to work. Dichotomous recording of work status (Yes/No) is blunt and does not address important aspects of workplace behaviour including absenteeism, presenteeism, return to usual activities and interference with activities. In the UK >20% of patients do not return to usual activities and have restrictions in their ability to work after hip replacement[39]. Measuring return to work should ideally consider specific elements of the job, the duties and the hours worked.
- Assessment of workplace disability and productivity is poorly reported after hip and knee replacement. Validated tools exist (e.g. Workplace Activity Limitations Scale (WALS), Work Limitations Questionnaire (WLQ)) but little is known about their applicability to the UK workforce and their utility as outcome measures for clinical trials[53].

  The appropriateness of individual return to work measures for use as primary outcome measures in a clinical trial is currently unclear

There was therefore a need for preliminary research to generate relevant evidence and develop an occupational advice intervention to support a future clinical trial. The OPAL study was commissioned to facilitate this.

1.5 Aims and Objectives[140]

1. To evaluate the specific needs of the population of patients who are in work and intend to return to work following hip and knee replacement.
2. To establish how individual patients return to work; the role of fit notes, clinical and workplace-based interventions, and how specific job demands influence workplace disability and productivity.
3. To establish what evidence is currently available relating to return to work / occupational advice interventions following elective surgical procedures.
4. To understand the barriers preventing return to work which need to be addressed by an occupational advice intervention.
5. To determine current models of delivering occupational advice; the nature and extent of the advice offered; and how tools to facilitate return to work are being currently used.

6. To define a suitable measure of return to work through systematic review and evaluation of specific measures of activity, social participation and return to work including specific validated workplace questionnaires.
7. To construct a multi-stakeholder intervention development group to inform the design and establish the necessary components of an evidenced based occupational advice intervention initiated prior to elective lower limb joint replacement.
8. To develop and manualise a multidisciplinary occupational advice intervention tailored to the needs of this patient group.
9. To test the acceptability, practicality and feasibility and potential cost of delivering the manualised intervention within current care frameworks and as a potential trial intervention.

Chapter 2: Methodological overview – OPAL Intervention Mapping Framework

The OPAL study employed an intervention mapping framework to deliver the aims and objectives listed in section 1.5 (page 25).

2.1 Intervention mapping

Intervention Mapping (IM) is a framework for developing effective theory- and evidence-based behaviour change interventions[54-58]. IM was developed for, and is widely used in health promotion, but the process has been applied to many other fields as well, including traffic safety and energy conservation[59] .It has also been used in rehabilitation, for example in the management of osteoarthritis and back pain[60] and stroke[61] as well as in work disability prevention[62].

The IM framework was first used in work disability prevention in 2007. Interventions developed using this methodology have included self-management at work of chronic diseases[63] and upper limb conditions[64], but the majority (6 separate interventions) have been designed to promote return to work[65-70]. However, only one study has focused on return to work following surgery[67]. Furthermore, in three of these studies an intervention has been designed but has yet to be implemented/evaluated[68-70].

Only three of the interventions to assist return to work, developed using an IM framework, have been formally evaluated in a RCT these are van Oostrom *et al* (2010)[71], Vermeulen *et al* (2011)[72] and Vonk Noordegraaf *et al* (2012)[67]. The details of these studies are described in Chapter 3 but they suggest that the IM framework being employed within OPAL can facilitate the development of an effective occupational advice intervention.

IM is a useful approach as it acknowledges that health is a function of individuals and their environments. Many health-related behaviours are dependent on individual knowledge, motivation and skills but are also determined by the actions of decision-making groups such as organisations and health authorities. Return to work interventions are complex and thus at higher risk of theory and/or implementation failure than simpler interventions such as medication delivery or hospital-based rehabilitation. The main characteristics of the IM protocol are to consider the individual within all the different levels of their environment, and to make explicit use of theories when defining the problem, the intended changes, and how these changes will be achieved. In this way, IM has the potential to prevent both theory and execution failures when developing and implementing return to work interventions, with better chances of demonstrating effectiveness.

IM is a stepwise approach to theory, evidence based development and implementation of interventions and consists of six stages: 1) needs assessment, 2) identification of intended outcomes and performance objectives, 3) selection of theory-based methods and practical strategies, 4) development of intervention components, 5) development of an adoption and implementation plan and finally 6) evaluation and feasibility testing.

2.2 The OPAL Intervention mapping process

The OPAL study followed the six-stage IM approach (Figure 1). Stages 1-3 (Phase 1) addressed aims 1-6 (*see Section 1.5, page 25*) by gathering information on current practice and barriers to change; it also provided a theoretical framework for intervention development. Stages 4-6 (Phase 2) addressed aims 7-9 (*see Section 1.5, page 25*). An overview of the activity within each stage of the IM process is given below with further details to be found within each of the corresponding chapters.

IM Stage 1: Needs assessment (*See Chapters 3-6*)
IM Stage 1 established the rationale for an occupational advice intervention within the target population by evaluating the discrepancy between current and desired practice. It utilised a variety of approaches including a rapid evidence synthesis (*see Chapter 3*), cohort study (*see Chapter 4*), national survey of practice (*see Chapter 4*), patient (*see Chapter 5*) and stakeholder (*see Chapter 6*) interviews. This information was then used to create a logic model of the problem considering how the behaviours of the target population increase the risk, prevalence, incidence and burden of the problem and how interpersonal, organisational, community and societal factors influence return to work directly or through influence on the behaviour of the target population. These behavioural and environmental factors were then mapped to specific theory and evidence-based factors and determinants to help provide an overview of the problem and a framework to address it.

IM Stage 2: Identify intended outcomes and performance objectives (s*ee Chapter 7*)
Stage 2 used the findings from Stage 1 to specify who and/or what needs to change in order for patients to make a successful return to work following hip/knee replacement. A provisional matrix of performance objectives for key stakeholder groups was constructed outlining the personal determinants, external determinants and expected outcomes for each objective.

IM Stage 3: Selecting theory-based methods and practical strategies (s*ee Chapter 7*)
In stage 3 a list of possible components matched to each performance objective/determinant was generated. Using theory, evidence, experience and consensus the most practical ways to implement these interventions were identified. These intervention 'components' formed the basis of the statements presented to stakeholders as part of the Delphi consensus process (*see IM stage 4*) and helped to develop the first iteration of the developed occupational advice intervention.

IM Stage 4: Development of intervention components (see *Chapters 8 and 9*)
Stage 4 used the information and associated occupational advice strategies identified within the first three IM stages to develop specific tailored tools and materials. To help refine these components, a multi-stakeholder intervention development group was created to reach agreement about the design, content, delivery, format and timing of the proposed occupational advice intervention. To facilitate this process a modified three round Delphi consensus process was employed. Information from the Delphi consensus process was then used to refine and finalise the occupational intervention.

IM Stage 5: Adoption and implementation plan (s*ee Chapter 10*)
In stage 5 strategies for the implementation and adoption of the intervention were developed. This stage ran concurrently with the final stages of intervention development as the content, format and method of delivery became finalised. The implementation plan focussed on the delivery of the intervention within the realities of the NHS. As such the intervention and the associated implementation plan had to be adaptable to current practice, infrastructure and staffing at each of the three feasibility sites. This flexibility permitted delivery alongside current 'standard' care whilst stipulating the achievement of specified performance objectives against which the fidelity of the intervention was assessed.

To facilitate the implementation and adoption of the intervention, education and training materials were developed for each of the staff groups involved in its delivery. Appropriate support and training systems were developed and an implementation plan constructed to assist adoption at each site which included a site visit and on-going support from the OPAL investigators.

IM stage 6: Evaluation plan and feasibility testing (s*ee Chapter 10*)
The final stage of the intervention mapping process evaluated the intervention by assessing four complimentary aspects of its delivery and performance:

- Assessment of intervention fidelity: Quantitative evidence that the intervention was delivered against specific performance objectives for both the hospital orthopaedic team (staff objectives) and patient (patient objectives).
- Assessment of intervention quality: Qualitative assessment of the intervention delivery obtained by interviewing patients and staff groups about what worked and what didn't, why it didn't work or why it went well?
- Assessment of feasibility data: Preliminary comparison of outcomes using data obtained from IM stages 1 (pre-intervention) and 6 (post-intervention).
- Assessment of economic data: Approximate cost estimates for the intervention using derived health economic data

In addition, the feasibility stage collected information that would help to shape the design and development of a future clinical trial by assessing screening, recruitment, consent and follow up procedures and rates at each of the study sites. A formal pilot study was not undertaken at this stage as per the commissioning brief.

The OPAL intervention mapping approach described above is outlined in figure 1 and a diagram describing development of the OPAL occupational advice intervention is shown in figure 2.

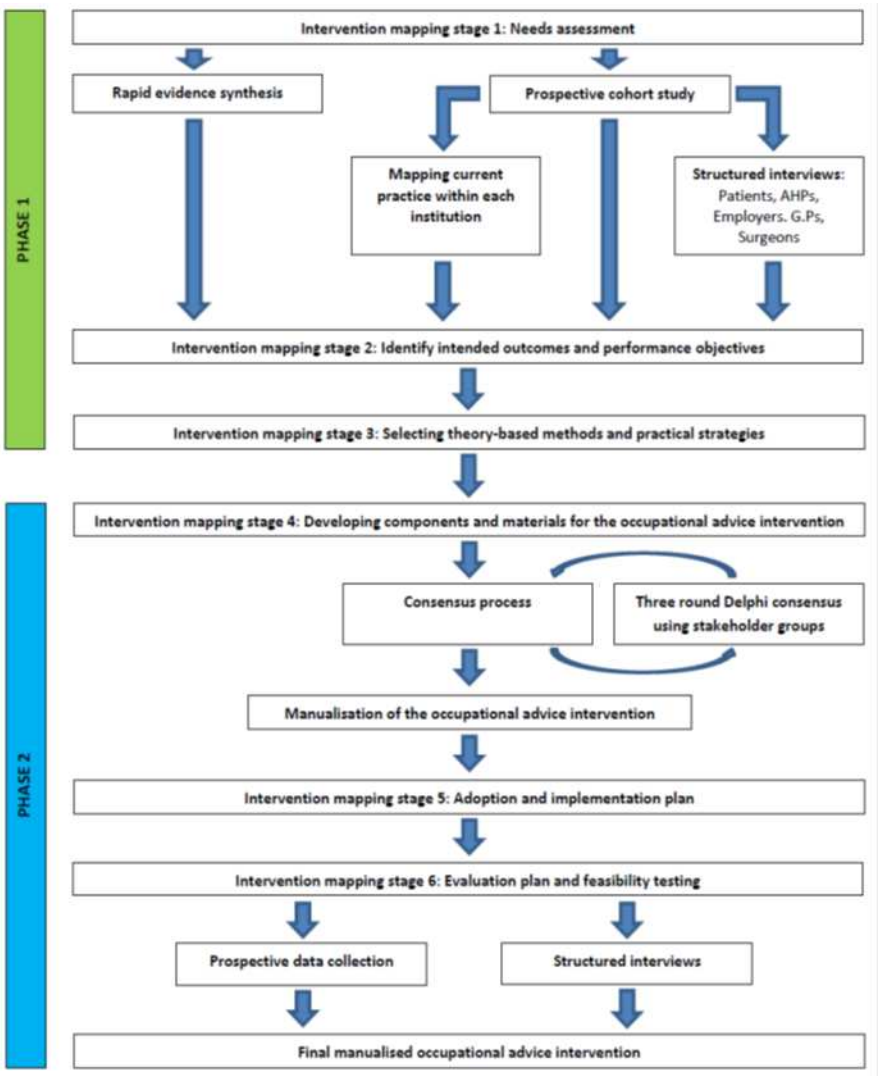

Figure 1: Overview of the OPAL intervention mapping methodology

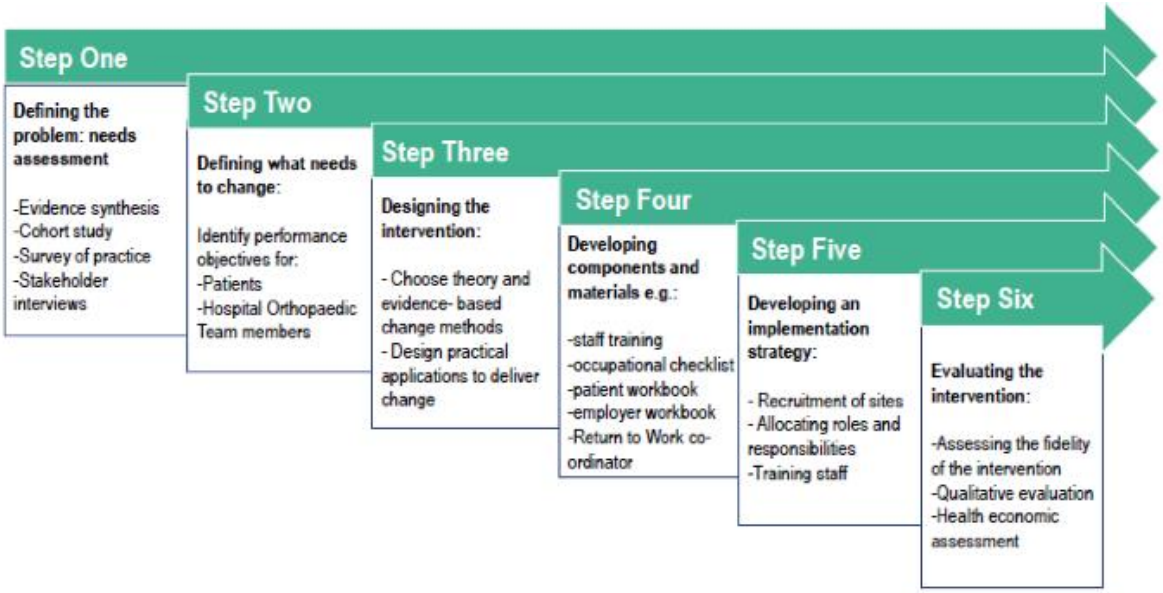

Figure 2: Diagram of the stages of development of the OPAL occupational advice intervention

2.3 Stakeholder engagement strategy

Five key stakeholder groups central to the development of an occupational advice intervention were identified: patients; employers and their associated occupational health departments; allied health professionals (occupational therapists and physiotherapists) and nurses; orthopaedic surgeons; and general practitioners.

To maximise engagement with these stakeholder groups, nominated OPAL investigators were responsible for the identification and engagement of stakeholders within their area of expertise. This included stakeholder recruitment from a number of professional bodies and employment institutions providing the breadth of opinion and insight required to ensure generalisability and acceptability of findings and assist with dissemination of findings at various stages of the study (Table 1).

Table 1: OPAL stakeholder recruitment strategy

Stakeholder group	Nominated OPAL investigator	Participants recruited via:
Patients	Mrs J Fitch	• National Joint Registry patient network • British Orthopaedic Association patient group • Patients identified from the cohort / interviews in phase 1
Employers and occupation health services	Prof S Khan	• Federation of Small Businesses • EEF – The manufacturers organisation • Confederation of British Industry • Trade Union Congress • Department for Work and Pensions • The Fit for Work Service • The Work Foundation • The Society of Occupational Medicine • Institution of Occupational Safety & Health • Society of Occupational Health Nurses • Employers identified from the interviews in phase 1
Orthopaedic Surgeons	Mr I McNamara	• British Hip Society • British Association for Surgeon of the Knee • British Orthopaedic Association • Surgeons identified from the interviews in phase 1
Allied Health Professionals (AHPs) and nurses	Dr D McDonald & Dr C Coole	• Association of Chartered **Physiotherapists** in **Occupational** Health and Ergonomics • Chartered Society of Physiotherapy • Occupational therapy networks e.g. Royal College of Occupational Therapists Specialist Sections in Work and Trauma & Orthopaedics • Royal College of Nursing • AHPs and nurses identified from the interviews in phase 1
General Practitioners	Mr P Baker& Prof A Rangan	• Local Medical Committees • Royal College of General Practitioners • Local Clinical Commissioning Groups • GPs identified from the interviews in phase 1

2.4 Data collection and handling

Personal data collected during the trial was handled and stored in accordance with the 1998 and 2018 Data Protection Acts. All electronic patient-identifiable information was held on a secure, password-protected database accessible only to essential study personnel. Only OPAL investigators (University of York & University of Nottingham), the Sponsor (South Tees Hospitals NHS Foundation Trust) and the recruiting NHS Trust had access to the personal data. Written consent was taken for collected data to be linked to routinely collected health data stored in national databases (via NHS Number) although this activity did not form part of this research project.

2.5 Project Management

The South Tees Hospitals NHS Foundation Trust was the sponsor for this project. This study was compliant with the Research Governance Framework and MRC Good Clinical Practice Guidance. The Trial Steering Committee (TSC), who met approximately 6 monthly during the OPAL study, oversaw the study.

2.6 Ethics approval

The OPAL study was approved by the East Midlands - Derby Research Ethics Committee (IRAS ID 200852) on the 18th August 2016.The employer/workplace representative interviews were approved by the University of Nottingham ethics committee on 25th July 2016. Health Research Authority approval was received on 4th October 2016. See ethics approvals and HRA correspondence documents

2.7 Project registration

- International Standard Randomised Controlled Trials Number Trial ID: ISRCTN27426982 (Date registered: 20/12/2016). Link: http://www.isrctn.com/ISRCTN27426982
- International prospective register of systematic reviews (PROSPERO) Registration: CRD42016045235 (Date registered: 04/08/2016)

2.8 Protocol management and version history

See study protocol version 4.0. A published version of the protocol can be downloaded at https://www.ncbi.nlm.nih.gov/pubmed/29950166. Protocol version history is provided in *Appendix 1, Section 1*.

2.9 Patient and Public involvement

Active patient and public involvement (PPI) was ensured throughout the study. During the development of the grant application PPI was sought from the National Joint Registry (NJR) patient network and British Orthopaedic Association (BOA) patient liaison group. Six patients who had a joint replacement contributed to the initial proposal.

A recurring concern during initial discussions with patients was that a 'one size fits all' approach could be too generic. Other issues raised were variations across hospitals in the support provided; the needs of specific occupational groups such as self-employed; different expectations amongst people about return to work; the impact of the employer perspective, coupled with concerns about how early return to work interventions may result in pressure for people to return too early.

To address these concerns, OPAL specifically assessed individual patient's experiences to enable an individualised intervention to be developed. Patient interviews explored individual patient's needs, concerns and expectations related to the return to work process. This information, along with information from other stakeholders, shaped the development of the intervention during the rest of the study. In Phase 2 patients were included within the Delphi consensus process ensuring we understood and addressed issues pertinent to them within the intervention. In addition to patients, engagement from other stakeholders was ensured during both phases of the OPAL study as part of the study design maximising their engagement in the design and development of the intervention.

The study investigators included a patient representative as co-applicant (Mrs Judith Fitch). Mrs Fitch was involved in the on-going management of the study through her involvement with the Trial Management Group, and intervention development meetings. There was also a lay member sitting on the Trial Steering Committee. Throughout the project we continued to work with the NJR patient and public involvement group and the BOA patient network as well as patient and public involvement groups local to the sponsor site (South Tees). These groups helped us to develop study materials for the cohort study, patient interviews, Delphi consensus process and feasibility elements of OPAL. This included refining the study screening and consent processes, and developing the content of all patient facing materials ensuring they were ethically sound, participant friendly and

acceptable to the patient population. PPI members had the opportunity to contribute to OPAL via face-to-face meetings with the investigators, via telephone, email or post. The costing for all PPI activity was calculated using the guidelines on the INVOLVE website. PPI members were informed of the various resources and opportunities available for patient and public engagement with NHS and research.

Once the study was complete, the chief investigator held a patient and public focus group meeting including hip and knee arthroplasty patients, a carer and a patient ambassador where an outline of the study and the study outcomes were presented. The Intervention developed with its associated resources (Patient and employer workbooks, performance objectives) was discussed and queries about specific aspects of the study findings and intervention answered. The group agreed the designed Intervention was highly valuable to the patient population. They agreed it should be tested in a larger setting and commented on its potential to be adapted to other areas. The group also discussed dissemination plans for the research findings and future research. The plain English study summary included in this report was reviewed and edited by the group.

Chapter 3: Intervention Mapping stage 1 - Needs Assessment: Rapid Evidence Synthesis

3.1 Introduction

A rapid evidence review of existing quantitative and qualitative evidence on occupational advice interventions for people undergoing any type of elective surgery was undertaken. This was to ensure that the best available evidence informed the OPAL occupational advice intervention. All elective surgery populations were included as it was considered likely that there would be some generalisability across different surgery populations. However, due to the paucity of information available on this population, established following initial screening of the database searches, the review was widened, following the advice of the Trial Steering Committee. It also therefore included systematic reviews evaluating occupational advice interventions supporting return to work for individuals with chronic musculoskeletal problems.

3.2 Objectives

The rapid evidence review supported study objectives 3, 4, 5 and 6 (*see section 1.5, page 25*).

3.3 Methods

Overview
A rapid review methodology was used. Given that the commissioner had already identified an evidence gap relating to occupational advice interventions for patients undergoing hip and knee replacement, and the need for primary research and a future trial (if feasible), a full systematic review was not warranted. The purpose of the rapid review was to identify interventions that showed evidence of benefit (or a signal of benefit where study is underpowered), to explore the content of the interventions and identify aspects that could inform the development of the intervention for people undergoing lower limb joint replacement.

The term rapid review covers a range of methods and there is no generally accepted definition, though generally the approach addresses a trade-off between time and methodological rigour and comprehensiveness of the end product [73]. We focused on the systematic review evidence in the first instance, included only English-language articles published in the last 20 years, restricted the range of databases searched, and double-checked a proportion of the literature searches, rather than 100% (which is accepted practice for a full systematic review). The protocol for the rapid review is available on PROSPERO (protocol registration number CRD42016045235)[74].

Literature searches
There were two sets of searches: one for systematic reviews and one for primary studies reported outside the search dates or remit of the reviews identified.

The Cochrane Database of Systematic Reviews and Database of Reviews of Effectiveness were searched in August 2016 for systematic reviews up to 2015. Additional supplementary searches were undertaken for the period 2015 to July 2016 in MEDLINE and EMBASE. The search combined various terms for “occupational advice” and “return to work” with terms for “systematic reviews”. There was no restriction for type of population (e.g. elective surgery) so that the searches were as comprehensive as possible. The following five databases were searched for primary studies in August 2016: CINAHL, Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, Embase and OTseeker. The strategy combined terms for “surgery” and terms for “return to work” and “occupational advice”. The full search strategies are reported in *Appendix 2, Section 1.*

An information specialist undertook the searches. Both sets of searches were restricted to English language studies published in the previous 20 years (since 1996). Records were downloaded, added to EndNote bibliographic software, and were de-duplicated.

In addition, reference and citation checking of included studies was undertaken to identify further potentially relevant records.

Eligibility criteria

The eligibility criteria that were applied are displayed in Table 2. We anticipated the literature outside elective surgery to be vast and dominated by return to work following mental ill-health and musculoskeletal problems such as back and neck pain, where generalisability to hip and knee surgery is less certain, hence we initially excluded studies where the participants were not undergoing an elective surgical procedure.

However, following an initial screening of the search results, where only a small number of studies were identified for elective surgical populations, we widened our inclusion criteria for the population. Hence, the review also included systematic reviews that evaluated occupational advice interventions, aiming to support return to work, targeted at participants with *chronic musculoskeletal problems* as this population was considered most similar to our target population of interest. Due to resource constraints it was not feasible to widen the inclusion criteria in a similar way for the supplementary primary study searches.

Study selection

The title and abstracts of all studies identified by the literature search were screened for inclusion by one reviewer, with 30% screened by a second researcher. The full text of potentially eligible studies was retrieved and assessed for eligibility by a single reviewer, with 100% also being assessed by a second reviewer, following the development and piloting of a screening tool. Any disagreement between the reviewers regarding this sample was resolved via discussion with a third reviewer.

Table 2: Eligibility criteria for the rapid review

	Review of systematic reviews	Review of primary studies
Study type	Systematic reviews with no restriction on the types of primary studies they included.	Randomised controlled trials (RCTs), non-randomised designs (e.g. non-randomised controlled trials, controlled before-and-after and interrupted time series studies) and qualitative studies that explore process issues such as barriers and facilitators to implementation and stakeholder perspectives.
Population	1- People who have been on a period of sickness absence or where a prolonged absence is anticipated following an elective surgical procedure. 2- Individuals with chronic musculoskeletal problems.	People who have been on a period of sickness absence or where a prolonged absence is anticipated following an elective surgical procedure.
Interventions	Any occupational advice intervention, where occupational advice includes occupational therapy advice and/or occupational health advice. No restriction on when the intervention was provided.	
Comparator	No restriction on the types of comparators included in reviews.	No intervention, usual care or another occupational advice intervention. Qualitative studies were not required to have a comparator
Context	Studies delivered in any setting were included, i.e. primary, secondary, community and workplace. This was to capture the widest evidence in order to inform the development of the intervention.	
Outcomes	The outcomes of interest were those related to return to work, return to normal activities and social participation. Condition-specific measures were excluded, except where they were specifically related to people with hip or knee functional limitations. Also included were any process measures related to the delivery of interventions, such as barriers and facilitators and any data on stakeholder perspectives. There was not a single primary outcome for the review, given the broad aims of the review.	

Data extraction

A standardised data extraction form was developed and piloted to record key information such as: population, study design, intervention details, outcomes, surgical procedure type and results (further details are listed below). Items related to the intervention followed the Criteria for Reporting the Development and Evaluation of Complex Interventions in Healthcare [75], with outcome data extracted from the primary studies, and summary information provided for the systematic reviews. The Data Extraction forms can be found in *Appendix 2, Section 2*. Data extraction was undertaken by a single reviewer, and checked by a second reviewer.

- For primary *quantitative* studies, the data extraction form recorded information including: population, intervention (e.g. content of the intervention, material and tools used for delivery, who delivered, setting and any theoretical basis such as behaviour change theory), process measures related to the delivery of interventions such as barriers and facilitators, stakeholder perspectives (patients, healthcare professionals, employers), study methods (e.g. study design, how outcomes were measured, length of follow-up), outcomes (e.g. what outcome measures are used in studies to assess return to work, return to normal activities and social participation), and surgical procedure type.

- For primary *qualitative* studies, data were extracted for the following items: population, study objective, surgical procedure type, method of evaluation and underpinning methodology, views and experiences (related to return to work, normal activities and social participation), and process measures related to delivery of interventions.
- For reviews, the data extraction form also collected information such as: objectives of the review; search strategies (e.g. searched databases, date of literature search, languages, inclusion/exclusion criteria); number of studies included in review, sample sizes and details of data synthesis; types of studies included/setting, population, interventions assessed and outcomes assessed; quality assessment tools used; analysis (e.g. meta-analysis); results of the review; key conclusions; limitations.

Assessment of risk of bias

Careful consideration was given to the risk of bias tools that were selected for use in our evidence synthesis, with a recent systematic review noting there being several limitations of existing tools regarding their scope, guidance for judgements on the risk of bias, and measurement properties [76] . Each of the tools listed below were considered to be appropriate for the different study type in order to adequately capture biases, with further information provided in the corresponding references for each tool. The quality of the included studies was assessed at the study level by one researcher and checked by a second. Specifically:

- For systematic reviews: the AMSTAR tool [77, 78], a measurement tool to assess the methodological quality of systematic reviews.
- For RCTs: the Cochrane Risk of Bias Tool [79].
- For non-randomised studies (including non-randomised controlled trials, controlled before-and-after and interrupted time series studies): the ROBINS-I (Risk Of Bias In Non-randomized Studies – of Interventions) tool [80].
- For qualitative studies: the Critical Appraisal Skills Programme (CASP) qualitative checklist [81].

Data synthesis

Details of studies were tabulated and presented in a narrative synthesis in order to address the review questions. A meta-analysis was not possible due to heterogeneity of studies and limited availability of RCTs. Key study characteristics have been tabulated, and the outcome domains investigated in the studies and specific outcome measures used have been mapped.

Many of the systematic reviews included had broad inclusion criteria and included primary studies outside the remit of interest i.e. occupational advice interventions. Therefore, for the systematic reviews, the relevant primary studies were pulled out for closer examination, with the studies reported according to whether they featured a (i) surgical or (ii) wider musculoskeletal population. Mapping of the content of the interventions was also undertaken to allow exploration of all intervention components, materials and tools, any underlying theoretical basis, and any issues related to delivery and implementation. Data was explored and described by individual review question. There was no subgroup analysis planned as part of this review.

3.4 Results

The results of the review are presented in two sections; the first relates to the included systematic reviews, for both surgical and musculoskeletal evidence, and the second section refers to the review of primary studies of elective surgery populations.

3.4.1 Systematic reviews

Study selection

There were 859 records screened for relevance following deduplication of the results of the searches for systematic reviews (Figure 3). On reviewing titles and abstracts, 812 records were excluded, with 50 obtained in full text form to assess eligibility for inclusion. A total of 17 systematic reviews were included, as listed in *Appendix 2, Section 3*. The 33 excluded reviews and their associated exclusion reasons are available in *Appendix 2, Section 3*.

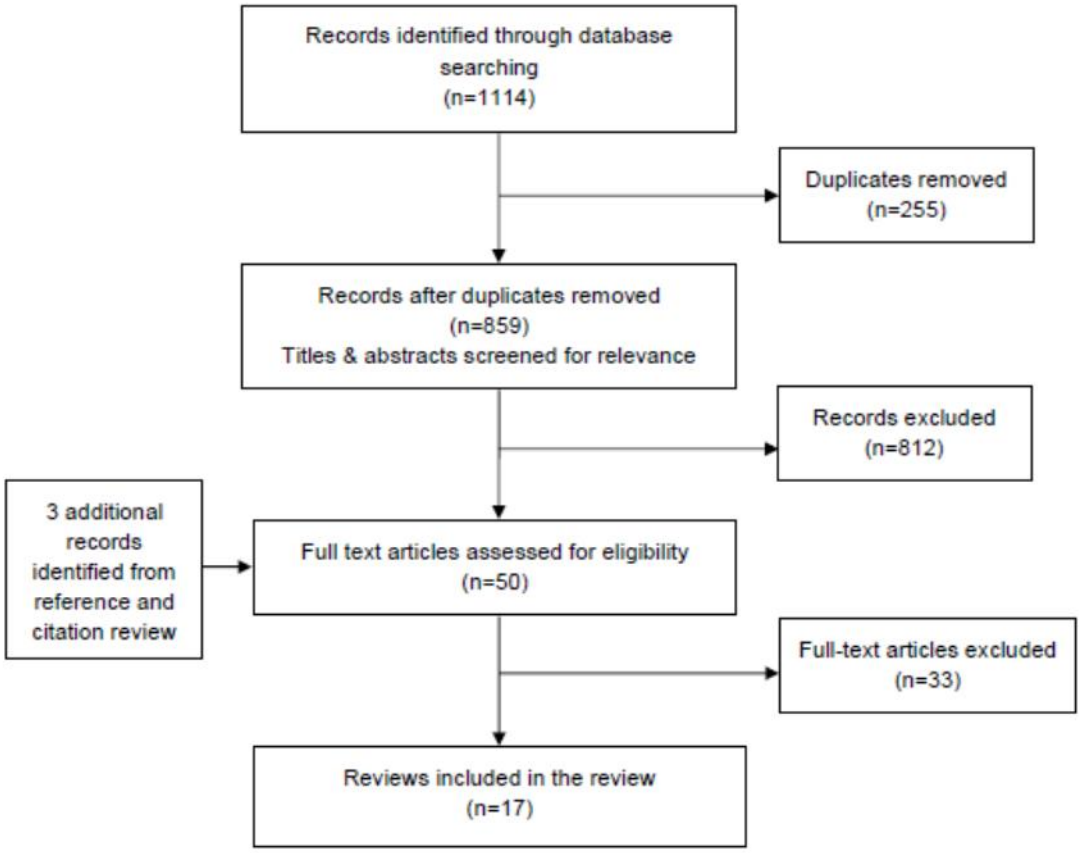

Figure 3: Study selection for review of systematic reviews

Overview of included studies and reviews

The 17 systematic reviews included a total of 188 unique studies (242 before removing duplicated studies). *Appendix 2, Section 4* summarises the key review characteristics, the eligibility criteria, the work-related outcomes assessed and a summary of the review authors' conclusions. The AMSTAR scores for the included systematic reviews are also provided in *Appendix 2, Section 4* alongside scores for individual items. These ranged from 3 to 9 out of a total of 11 possible points. The majority of reviews used robust methods to reduce risk of error and bias in study selection, data extraction and assessment of risk of bias. For some of the reviews, it was not possible to locate a protocol to verify that the review was conducted following a protocol. From the 188 included studies in the reviews, 30 were considered to be relevant for our review questions.

Only a single review was identified which focused on elective surgery (lumbar disc surgery patients); [82] the remaining 16 included a range of musculoskeletal conditions [83-98]: back pain (n=6), neck and shoulder pain (n=1), musculoskeletal issues/conditions more generally (i.e. musculoskeletal-related sickness absence, non-specific musculoskeletal complaints; n=2), and neck pain (n=1), repetitive strain injuries (n=1) and fibromyalgia and musculoskeletal pain (n=1). The remaining four reviews

took a broader approach regarding the population; for example, by specifying that individuals were of working age and participated in a rehabilitation program; or by including patients with a range of permanent disabilities; or focusing on workers who were off work for reasons as specified in the review.

Type of return to work (RTW) interventions

Almost half of the RTW interventions featured in the included reviews were of a multidisciplinary nature in a health care setting, with seven involving multidisciplinary rehabilitation programs [82, 85, 88-90, 94, 99]; four of which featured a biopsychosocial element [88-90, 99]. A further seven reviews focused on specifically workplace-based interventions [83, 84, 87, 93, 95, 97, 98], with the remaining three involving other types of interventions; one related to physical conditioning as part of a RTW strategy [96], one investigated secondary prevention for back disorders [86], and the other featured interventions which fell into five different categories (detailed below) [92].

a) Workplace-based interventions

One review included interventions conducted at the workplace only (clinical and healthcare interventions outside the workplace were excluded) that were either group-based or individual, and which aimed at modifying body function, activity performance, participation, environmental or personal factors [83]. The interventions could either be comprised of a single strategy, or a combination of strategies. The review by Franche *et al*. [87] included studies whose interventions were provided by the workplace, or by an insurance company; or healthcare provider in very close collaboration with the workplace. Nevala *et al*. [93] focused on interventions comprising workplace accommodation, occupational rehabilitation, vocational rehabilitation, and assistive technology interventions. Studies featuring workplace interventions implemented directly by the employer, including involvement from occupational health services, were included in the review by Vargas-Prada *et al*. [97].

The review by Carroll *et al*. [84] considered interventions which featured either full or partial involvement of the workplace, or involved the intervention being delivered via direct employer/representative contact. Williams *et al*. [98] reviewed studies that featured interventions undertaken at the workplace, in addition to studies involving secondary prevention interventions for the condition under consideration. The review by Palmer *et al*. [95] focused on interventions delivered in a workplace or primary care setting, or in collaboration with employers or primary care providers.

b) Multidisciplinary rehabilitation program interventions

Desiron *et al*. [85] focused on occupational therapy interventions as part of a multidisciplinary rehabilitation program, with the review by Norlund *et al*. [94] specifying that the multidisciplinary interventions should involve two or more healthcare disciplines. The surgical review [82] included studies which focused on active rehabilitation programs, where these included exercise therapy, strength and mobility training, physiotherapy and multidisciplinary programs.

c) Multidisciplinary biopsychosocial rehabilitation program interventions

The review by Kamper *et al*. [88] included studies which featured multidisciplinary biopsychosocial rehabilitation interventions, defined as involving a physical component and at least one of the following elements: biopsychosocial, social, or occupational. The reviews by Karjalainen *et al*. [89, 90, 99, 100] focused on studies whose interventions featured a biopsychosocial multidisciplinary inpatient or outpatient rehabilitation program, specifically stating as part of their eligibility criteria that the program should consist of a physician's consultation, in addition to a psychological, social, or vocational intervention, or a combination of these. Studies featuring rehabilitation interventions that were solely or predominantly medical were excluded. Note that the Karjalainen *et al*. 1999 [89] review did not state the word 'biopsychosocial' in the intervention description; however, the intervention was set out to incorporate the same elements, and due to being derived from the

review on common musculoskeletal disorders by the same authors, it has been placed in the biopsychosocial category.

d) Other interventions

In their review, Elders *et al*. [86] included interventions relating to a secondary prevention intervention in a non-healthcare setting for back pain or disorders. These comprised either organisational or administrative interventions (including modified work and early RTW); technical, engineering or ergonomic interventions; or personal interventions. The review by Meijer *et al*. [92] featured interventions which fell into the following five categories: knowledge conditioning, physical conditioning, psychological conditioning, social conditioning, and work conditioning (e.g. vocational training and workplace-based interventions). Physical conditioning interventions, as part of RTW strategies, were reviewed by Schaafsma *et al*. [96], which were specified as comprising advice about exercises for restoration of functionality (neurological, musculoskeletal, systemic or cardiopulmonary), with an intended improvement in work status, and a relationship between the intervention and functional job demands. In addition, the intervention could include further components, such as advice on return to work and workplace involvement.

Individual relevant studies from the included reviews

The systematic reviews were included based on the scope of the reviews and their inclusion criteria meeting the eligibility criteria for our rapid review. However, the primary studies that were identified and included in the reviews did not necessarily all provide relevant data or fit with our review question, i.e. have an occupational advice intervention. Hence, if conclusions were to be drawn solely from the overall messages of each of the reviews, this would not be of use for our review, as several irrelevant studies would be feeding into this. As a result, we screened the list of included studies in each review and the key details from the studies identified as being relevant have been extracted and summarised in *Appendix 2, Section 5*, regarding work-related outcomes.

Effectiveness of interventions

The interventions that showed evidence of benefit are summarised in *Appendix 2, Section 6* comprising 14 musculoskeletal studies and one surgical study. The intervention content within the musculoskeletal studies varied, although generally featured rehabilitation, with multidisciplinary team involvement. The studies tended to relate to back pain or musculoskeletal pain in general. Specifically, six studies related to low back pain [101-108], one was for work-related thoracic/lumbar pain [109], one for upper extremity musculoskeletal disorders [110] and one for rheumatic disease [111]. More generally, four studies related to musculoskeletal disorders/pain [112-115] and one study investigated soft tissue injuries [116], which involved back pain, shoulders, lower extremity, neck and thoracic pain.

Duration and timing of the interventions varied, with participants often being on sick leave at entry to the program. Some interventions were more intensive [101-104, 107, 108, 110, 114-116], for example involving six hours a day for five days a week, for five weeks [103], whereas others involved only a few visits or sessions at larger time intervals. All of the interventions were delivered face-to-face. The multidisciplinary team involved in the effective interventions tended to comprise an occupational therapist, physiotherapist, other health care professionals, the employer/workplace supervisor, in collaboration with the employee. The majority of the rehabilitation interventions included components such as job accommodation, work hardening/simulation, physical therapy/exercises, vocational advice, workplace visits and educational classes, with some covering pain management.

The intervention that featured in the one surgical study of herniated lumbar disc surgery [117] followed a rehabilitation-orientated approach used by medical advisors to motivate patients and treating physicians towards social and professional reintegration. It was delivered face-to-face by medical advisors, with patients first visiting at 6 weeks post-operation, and monthly follow-up consultations.

The intervention also involved contacts with treating physicians and case discussion with medical advisors' colleagues (*see Appendix 2, Section 6*).

What components of the interventions are likely to be generic across conditions and surgical procedures and therefore generalisable to an occupational advice intervention prior to planned surgery for hip and knee replacement?

The effective interventions tended to involve rehabilitation programs, which took a multidisciplinary approach in general. In the majority of cases, it was not possible to disentangle the separate elements in order to determine whether certain components were playing more of a role in the effectiveness than others. The key components of the interventions that keep appearing irrespective of the condition and/or surgical procedure under consideration are summarised in figure 4.

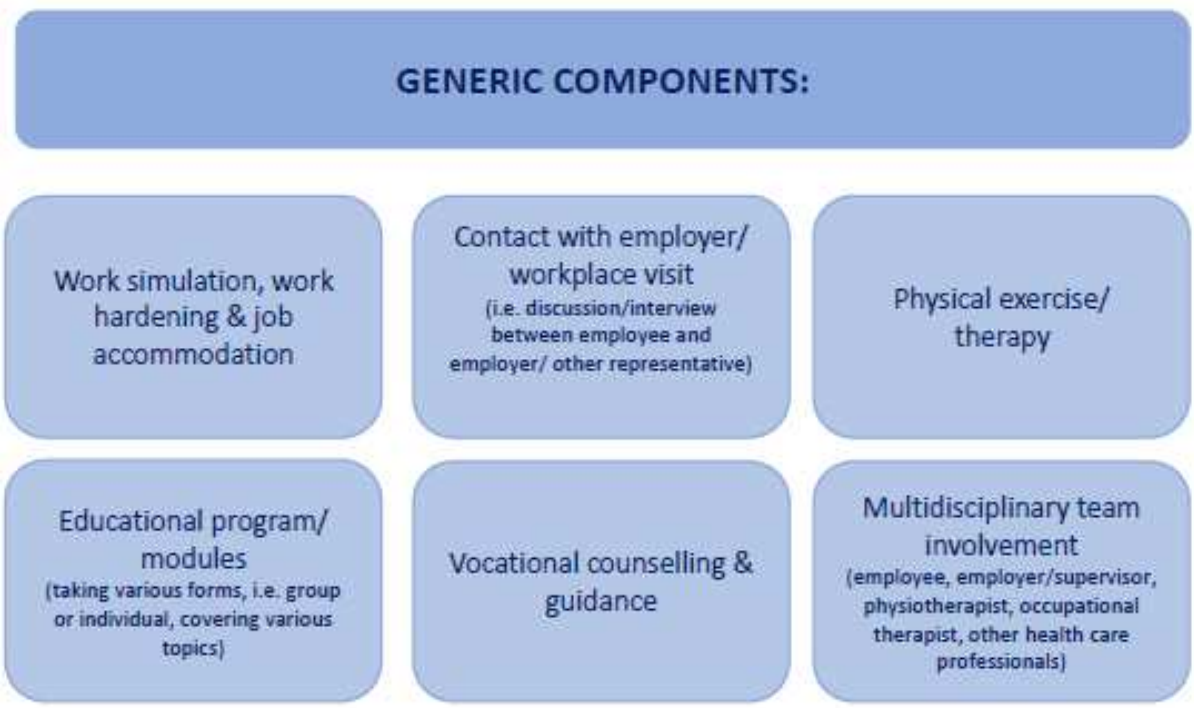

Figure 4: Summary of key components across effective interventions

Outcome measures for return to work, return to normal activities and return to social activities
The outcome measures used in the relevant primary studies from the systematic reviews are mapped in *Appendix 2, Section 7* by study and type of outcome measure. Outcome measures were grouped in the following categories to aid mapping, though in reality there is overlap between these categories: non-standardised return to work/activities measures, standardised scales for return to work/usual activities, measures focusing on musculoskeletal symptoms, quality of life, psychological and other measures.

Studies most commonly used some type of measure of return to work, though how this was assessed varied between studies. In some studies the measure distinguished between whether participants returned to work at full capacity or whether this was in an altered capacity, whereas other studies had a more blunt measure such as the proportion of participants who returned to work. Number of days of sick leave was also commonly used as an outcome measure. Patient reported outcome measures tended to focus more broadly on activities of daily living such as the disability component of the low back pain rating scale developed by Manniche *et al*. [118]. This component of the scale assesses ability to perform daily activities such as working, sleeping, housework, walking, sitting, lifting, dressing, driving and running. Other outcome measures focusing on ability to perform activities of daily living were the Oswestry Disability Scale (ODI) and the Roland-Morris Disability Questionnaire. There are multiple versions of the ODI and not all contain questions related to employment and none of the multiple versions of the Roland Morris Disability Questionnaire contain specific questions related specifically to employment. Two studies [119, 120] used measures which focused specifically on work using the Graded Reduced Work Ability Scale developed by Haldorsen *et al*. [121].

3.4.2 Primary studies (Surgical)

Study selection
The literature search of electronic databases identified 1,179 potentially relevant records for the primary studies (see Figure 5). After removal of duplicates, 989 primary studies were screened for relevance. A total of 856 primary studies were excluded on the basis of title and abstract and 140 full papers were retrieved for more detailed evaluation, which included 7 obtained via reference and citation checking. 136 papers were excluded and four studies met the inclusion criteria, with the included primary studies listed in *Appendix 2, Section 8*. One of these studies had already been identified in the review of reviews and was also included here for the sake of completion so that it was quality assessed and discussed in conjunction with the only other study identified of a surgical population.[117]. Details of excluded studies are also provided in *Appendix 2, Section 8.*

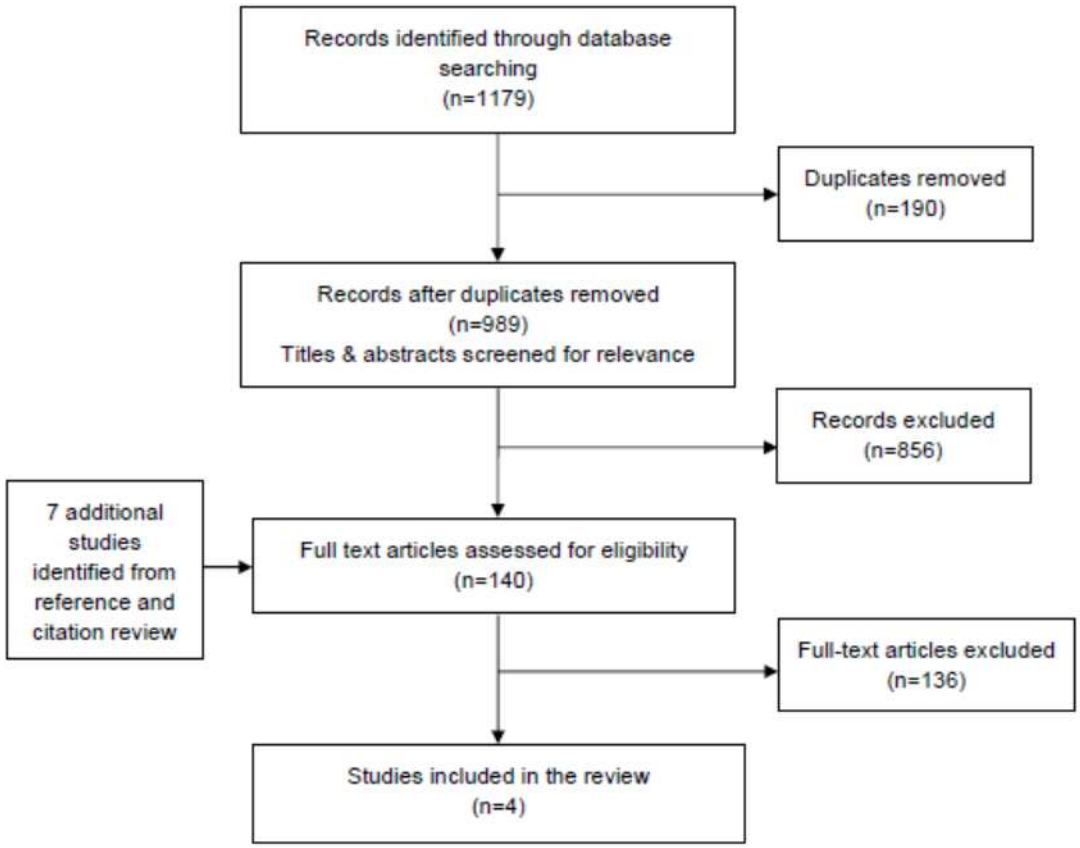

Figure 5: Study selection for review of primary studies

Overview of included studies

The four included primary studies comprised two RCTs (n=925 participants) conducted in the Netherlands and Belgium and two qualitative studies undertaken in England, and Texas, USA. The main study characteristics are presented in *Appendix 2, Section 9*

One RCT involved individuals who had undergone lumbar disc herniation surgery and the other featured participants following gynaecological surgery. One of the qualitative studies explored perspectives of patients who had undergone knee replacement surgery, whilst the other focused on cancer care.

Risk of bias

The risk of bias assessments are reported in *Appendix 2, Section 9*. The qualitative studies were of variable methodological quality; one study [122] met all of the CASP criteria with the exception of one area being unclear regarding whether the relationship between researcher and participants had been adequately considered. The other study [123] lacked detail in relation to data collection considerations, ethical issues and the researcher-participant relationship. One of the two RCTs was at an unclear risk of bias due to limited reporting on several elements of study design [117] and the other was at unclear risk of bias, due to lack of information about allocation concealment. [124]

Type of RTW interventions

One RCT evaluated a personalised eHealth intervention in terms of the effect on recovery and return to work [124], and the second assessed a rehabilitation-oriented approach which focused on early mobilisation and early resumption of professional activities in terms of the effect on return to work [117]. The Criteria for Reporting the Development and Evaluation of Complex Interventions in Healthcare were used for the interventions in the included studies (*see Appendix 2, Section 9)*.

The qualitative studies explored factors affecting return to work from the perspective of the patient following knee replacement [122], and factors influencing work disability following mastectomy through involvement of patients, therapists and employers [123]. Rather than discuss a defined intervention as such, both studies instead discuss individuals' experiences of advice or education and rehabilitation received from healthcare professionals [122] and employers [123] regarding return to work, amongst other issues relating to return to work.

Effectiveness of interventions

The RCT by Donceel *et al*. [117], of early mobilisation and early resumption of professional activities versus usual practice (control) for lumbar disc surgery, reported that at 52 weeks after surgery, a smaller proportion of patients in the intervention group (10.1%) had not resumed work compared to those in the control group (18.1%). The difference between the groups was found to be statistically significant (log-rank test: $p<0.001$), with the intervention group being more successful, i.e. a higher rate of return to work was found for the intervention group.

When evaluating a personalised eHealth program compared to a control website for recovery and return to work following gynaecological surgery, Vonk Noordegraaf *et al*. [124] estimated a hazard ratio of 1.43 (95% CI 1.003 to 2.040; $p=0.048$) in their adjusted intention-to-treat (ITT) analyses of return to work in favour of the eHealth intervention. Findings were comparable for the adjusted per-protocol analyses, but for the univariate crude ITT analyses, findings were not statistically significant.

Further details of the interventions are provided in *Appendix 2, Section 10*. The two interventions (a rehabilitation-oriented approach and a personalised eHealth intervention) were very different in terms of the surgical population under consideration (lumbar disc surgery and hysterectomy), and the content of the interventions. The modes of delivery varied between studies, from the intervention being delivered face-to-face, to being delivered purely online. In terms of the timing of the interventions, one was delivered six weeks after surgery, whereas the other was delivered both before and after surgery.

Taken collectively the two studies suggest that a multi-component intervention with a focus on assisting return to work for individuals undergoing elective surgery is beneficial. However, due to there being only two interventions from the included studies and that these were heterogeneous in nature, it was not possible to examine the components of the interventions that are likely to be generic across conditions and surgical procedures.

Outcome measures for return to work, return to normal activities and return to social activities

Donceel *et al*. assessed the proportion who had returned to work at 12 months follow-up [117]. In Vonk Noordegraaf *et al*. [124] the primary outcome was duration of sick leave until a full sustainable return to work, defined as the duration of sick leave in calendar days from the day of surgery until a full return to work to the same job, or to other work with equal pay, for at least 4 weeks without recurrence (partial or full). Other outcomes assessed in this study were quality of life (assessed by the Rand-36 Health Survey), general recovery (measured by the recovery specific RS-QoL (RI10), a validated recovery-specific quality of life questionnaire), and pain intensity (measured by a visual analogue scale questionnaire).

3.4.3 Barriers and Facilitators to intervention delivery and stakeholder perspectives

Truncated data extraction tables from the two qualitative studies on stakeholder perspectives are provided in *Appendix 2, Section 11*.

One UK study of 10 employed patients who had undergone total knee replacement identified several facilitators and barriers from the patient perspective [122]. Three key themes were identified that have relevance for delivery of an occupational advice intervention:

- ***Delays in surgical intervention and impact on work participation pre-operatively***
  Patients felt that their employment status and need to remain in employment were not fully taken into consideration in the decision-making process about whether surgery should take place or be delayed until they were older. Perceived delays in surgery due to their age impacted negatively on their work before surgery and had the potential to have a negative impact on future employability.
- ***Limited and inconsistent advice from healthcare providers to optimise return to work***
  Patients reported that the advice they received focused mainly on the needs of an older retired population and covered the in-patient stay and immediate post-operative period but not return to work. Some patients thought that they should not return to work until they were advised to do so. Some reported that they could have returned to work earlier. Advice appeared to be generic rather than tailored.
- ***Rehabilitation to optimise recovery and return to work***
  Patients reported that the post-operative rehabilitation they received was variable, their need to return to work was not routinely considered and that they would have benefited from a more tailored approach. However, rehabilitation staff played an important role in giving them confidence to progress in their recovery.

One US study obtained the views of 31 mastectomy patients, 18 physical or occupational therapists and 5 employers [123]. Information provided about patients' views on return to work was very limited. It is noteworthy that although "many women" described physical impairments that interfered with their ability to work, only one woman reported being asked by a healthcare professional about the physical requirements of her job. However, 81% of therapists reported that job requirements were addressed in their treatment goals. Employers reported that they had written guidelines in place appropriate for people returning to work following surgery but that they would find it useful to have more tailored information about their employee's physical restrictions, better patient education about expectations for recovery, more counselling services and better timing of clinic appointments to reduce disruption to work schedules. The authors commented that a common theme from all three stakeholder groups was the perceived dependence on doctors to guide the recovery process. It was suggested that some of this responsibility could be delegated to other healthcare professionals.

Chapter 4: Intervention Mapping stage 1 - Needs Assessment: Cohort Study, Health Economic Analysis and National Survey of practice

4.1 Introduction

A cohort study was undertaken to collect information about the population of working patients undergoing elective primary hip and knee replacement and the care their currently receive. A national survey of national practice was performed concurrently to provide additional information about current practice.

4.2 Objectives

The cohort study and survey of practice supported study objectives 1, 2 and 5 (*see section 1.5, page 25*).

4.3 Methods

4.3.1 Cohort study

Overview
Participants undergoing hip or knee replacement (or on the waiting list) that had been working in the 6 months prior to surgery were prospectively recruited over a five month period at four centres (Middlesbrough, Nottingham, Norwich, Northumbria). Potential patients were identified by the clinical teams and screened by the local research teams at each site. Eligible patients were approached, given a patient information sheet (*see Appendix 3, Section* 1), had an opportunity to ask the research team questions and then, if appropriate, consented into the study.

Questionnaires were completed at baseline (either post-operatively on the inpatient ward or pre-operatively in a pre-assessment clinic) and at 8 and 16 weeks post-surgery (postal) and for a subsample at 24 weeks post-surgery. Baseline questionnaires included:
- Patient demographic data;
- Functional status in the workplace (Workplace Limitations Questionnaire[125, 126] and Workplace Design Questionnaire[127]);
- Health related Quality of life (EQ-5D-5L);
- Depression and anxiety (Patient Health Questionnaire-9 PHQ-9 and Generalized Anxiety Disorder-2 tem (GAD-2));
- Brief Resilience Scale (BRS);
- Joint specific functional outcomes (Oxford Hip Score or Knee score);
- Employment details;
- Expectations of recovery and return to work after surgery.

Follow-up questionnaires included the same measures plus information about return to work, adaptions to hours and the workplace environment, use of fit notes, healthcare utilisation, interaction with occupational health services, and return to normal activities. See baseline hip questionnaire, and post-operative knee questionnaire documents.

Study inclusion/exclusion criteria
Inclusion criteria for patients recruited into the cohort study:
- Age 16 years and above

- Patients on the orthopaedic ward undergoing a primary hip or knee replacement or patients on the waiting list for a primary hip or knee replacement
- In work in the 6 months prior to their joint replacement

Exclusion criteria

- Lack of mental capacity
- Do not understand written and/or spoken English
- Emergency surgical procedure e.g. Surgery for an indication of trauma
- Surgery for cancer
- Surgery for infection

Sample size

A sample size of 150 patients was used as this number is sufficient for representative estimates within an 8% margin of error[128]. In addition, based on the rule of thumb of ten events per variable in logistic and cox regression, a sample size of 150 would allow a maximum of seven predictor variables to be included in the regression analyses; assuming 50% of participants experienced the outcome of interest.

Data checking and transfer

The cohort questionnaires collected anonymised patient data linked to patient contact information form (including patient identifiers) using a unique study number. The patient contact forms were used to administer follow up and contact patients that had consented to be approached for interview. Once a participant completed the questionnaire, a researcher entered the anonymised data in to an equivalent form in Qualtrics (SAP, Provo, USA). This process allowed the research team at the University of York to download a copy of the anonymised responses and conducted a blinded analysis.

To check for data entry errors, a selection of forms were second checked. For the first ten participants at each site a complete check of the questionnaires was performed. After this initial check, a further 10% were then sampled randomly from each site to ensure data quality was maintained. Any discrepancies were recorded and overall data error rates calculated.

Data analysis

Analyses were undertaken in Stata 15© (StataCorp 2015, TX, USA). The baseline and follow-up questionnaires (8, 16 and 24 weeks) were summarised using descriptive statistics (continuous: n, mean, standard deviation, median, 1st and 3rd quartiles, minimum and maximum and categorical: counts and percentages). Logistic regression models were used to predict early return to work (within 6 weeks) using preoperative, operative and postoperative characteristics. In addition, a Cox proportional hazards model was used to predict time to return to work in days from the date of the operation using the same covariates as the logistic model.

4.3.2 Health economic analysis

We had originally intended to utilise information from the survey of practice to inform the mapping of the 'standard care' pathway. However, the findings from the survey highlighted considerable variation in what constitutes standard care at different institutions and according to different individuals (e.g. surgeons, physiotherapists), making it difficult to define/quantify standard care. Therefore, it was not be possible to incorporate the survey data in the mapping of standard care for the economic analysis and this analysis was therefore based solely on the data collected from the cohort study.

Estimates of health care resource use

The resource use items comprised: visits to the GP, nurse, occupational therapist, physiotherapist, and 'other health service professional', hospital inpatient attendances, day cases, outpatient attendances, accident and emergency visits and physiotherapy hospital attendances. Participants were asked to answer the resource use questions and total resource use over 24 weeks estimated for each participant in relation to whether the visit was 'about your joint replacement' and also in relation to 'another reason'. Unit costs (*see Appendix 3, Section 3*) were obtained from established national costing sources: NHS Reference Costs [129] and PSSRU Unit costs of health and social care [130], and were applied to the resource use data up to 16-week follow-up; given only a subsample were followed to 24 weeks. Total costs for the 41 participants who completed 24-week questionnaires are presented in *Appendix 3, Section 3*. Costs are presented in UK pounds sterling at 2018 prices.

Return to work advice

The cohort questionnaires asked participants if they received any advice about returning to work following their operation, at all time-points, from the following: surgeon, GP, occupational health, physiotherapist, occupational therapist, employer and 'other' where they were asked to state what this was. For the purpose of costing, there was some overlap with the health care resource use items listed above; hence the only items that were costed separately from this question are occupational health and employer. The corresponding unit costs and sources are presented in *Appendix 3, Section 3*.

Estimates of health related quality of life

The EQ-5D-5L [131] was administered to the participants at baseline, 8, 16 (and 24, for a subset of participants) weeks. The 5-level EQ-5D version (EQ-5D-5L), launched in 2009 by the EuroQol Group, consists of the EQ-5D descriptive system and the EQ visual analogue scale (EQ VAS) [132]. There are five dimensions: mobility, self-care, usual activities, pain/discomfort and anxiety/depression, with each dimension having five levels (no problems, slight, moderate, severe and extreme problems). Following recommendations by NICE [133], the crosswalk between the EQ-5D-3L and the newer EQ-5D-5L was used to estimate utilities [134].

At baseline, the EQ-5D-5L was administered twice; one was the normal version of the questionnaire which asked, "Under each heading, please tick the one box that best describes your health today". The additional version asked participants, "please think back to your health before your joint replacement operation. Under each heading, please tick the one box that best describes your health 4 weeks before your operation". This was because at baseline we were aiming to capture participants' health status prior to surgery, but with the timing of completion (i.e. before or after surgery) varying for different participants, we included an additional version which asked about 4 weeks prior to surgery.

Productivity loss

Cost estimates were attached to productivity losses using data from the cohort questionnaires regarding the number of days that participants missed from work because of the joint that required joint replacement surgery over the 6 month period prior to surgery. The number of days missed from work was multiplied by a daily wage of £114, which was based on median full-time gross weekly earnings of £569, sourced from the Office for National Statistics[135]. The same daily wage was attached to the number of days missed from work following the participant's surgery, to generate a mean cost per participant due to productivity loss over the period following surgery.

Data analysis and presentation of results
For each resource use item, data are presented for all available cases, and also according to complete cases, whereby participants with missing data at any of the questionnaire time points were excluded. The missing data were due to either participants not returning the questionnaire or not completing the relevant questions on the questionnaire. Similarly, the EQ-5D findings are displayed for all available cases. Analyses were undertaken in Stata 15© (StataCorp 2015, TX, USA). Data were summarised separately by type of replacement.

The cost of the intervention is presented in Chapter 10, as part of the feasibility assessment.

4.3.3 Survey of practice

A web-based electronic software (surveymonkey) was used to create the survey. To achieve national dissemination, a three-armed sampling strategy was used. Firstly, the National Joint Registry (NJR) for England, Wales and Northern Ireland was e-mailed to the clinician leads in 149 individual trusts who were asked to disseminate the survey to relevant members of their clinical teams. Secondly, a link to the survey was embedded in an article about OPAL in the July edition of the NJR ebulletin (http://webactivate.hqip.org.uk/index.php?action=social&c=284&m=367) which has an email readership of >3800 stakeholders. Thirdly, to capture clinical teams in Scotland the survey was distributed via the Chair of the Scottish Committee for Orthopaedics and Trauma (SCOT) to members for dissemination within local organisations. The survey was available for completion for 6 weeks and collected information from all of the hospital orthopaedic team involved in the treatment of hip and knee replacement patients.

The survey collected information specific to each member of the hospital orthopaedic team. The survey explored: 1) when each grouped interact with patients as part of their pre-operative pathway 2) whether 'return to work' advice was routinely given during this interaction 3) the methods used to deliver 'return to work' advice 4) confidence delivering advice and 5) the need for an occupational 'return to work' advice intervention. The survey also offered the participants the opportunity to provide free text comment. The survey was released on 1st July 2017 and responses were collated 6 weeks later with the last response received on 11th August 2017. See OPAL survey of practice document.

Each question was summarised using simple descriptive statistics and, where appropriate, by job role. Direct comments from the 'free text' question were grouped based on positive or negative experiences of delivering return to work advice.

4.4 Results

4.4.1 Cohort

4.4.1.1 Screening data
Overall 765 people were screened of whom 202 (26.4%) were in work in the six months prior to surgery and were eligible for inclusion. All 202 patients in work met the other eligibility criteria. Figure 6 details the flow of participants through the study and details reasons for exclusion and non-participation. In total, 162 patients (80.2% of eligible patients) consented, of whom 154 (95.1%) provided baseline data (77 hip replacements and 77 knee replacements) and were followed up. Participants were recruited from all four sites over a five month period (1st November 2016 to 30th March 2017): Nottingham (n=42), Norfolk & Norwich (n=12), South Tees (n=62) and Northumbria (n=38).

OPAL intended to capture data from two defined groups of patients (Figure 6). Group A included patients in work prior to surgery and planning to return to work after surgery; and Group B included patients in work prior to surgery but planning to retire after their operation. However, only six screened patients (3 consenting) were in group B limiting the ability to analyse data from this group.

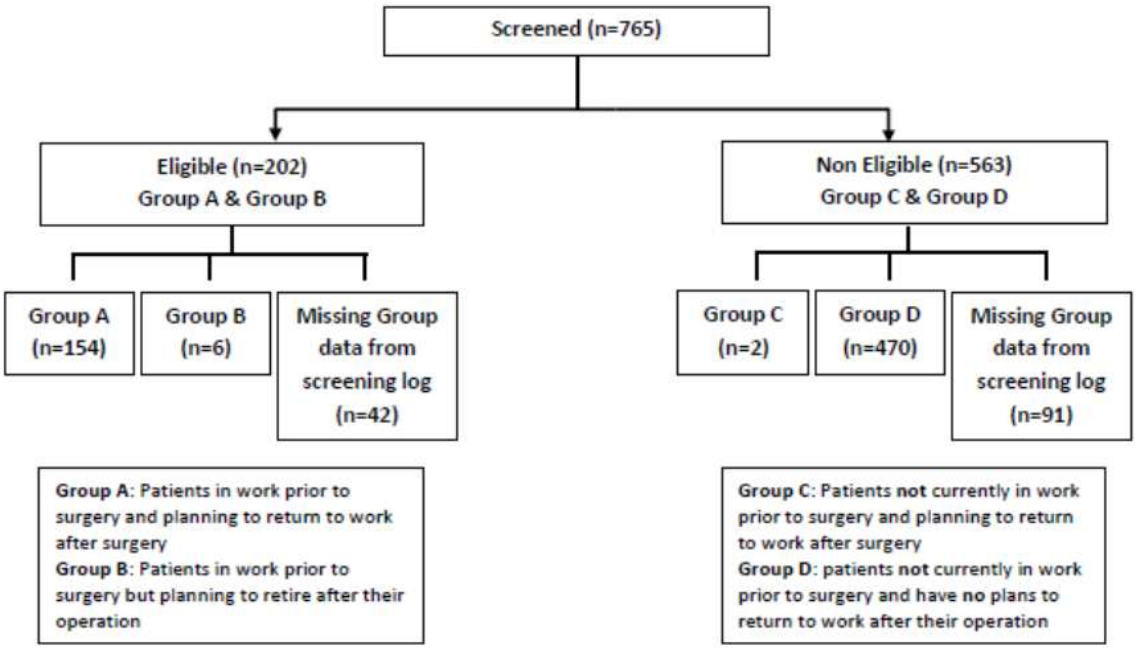

Figure 6: Screening log data describing work status prior to surgery and intention to return to work after surgery

4.4.1.2 Baseline data

Population Characteristics

The participants in the cohort were on average 60.1 years old (SD 9.4), ranging from 31 to 86 years old. The average ages were similar for the hip (58.9 years), and knee replacement (61.3 years) groups. There were slightly more males (n=85, 55.2%) in this cohort than females (n=64, 41.6%) with balance across the two types of operation; a few participants did not state their gender (n=5). The median BMI was 28.2 kg/m^2 (range15.9 to 44.9 kg/m^2). Almost all of the participants were of white ethnicity (94.2%), with one Asian participant, and three in the 'Other' ethnicity category.

When asked about their health, 81.2% of participants said that they did not suffer from chronic health problems, with a slight difference between those undergoing hip, (85.7%) and those undergoing knee replacements (76.6%). Of the participants undergoing hip replacements, 48.1% stated they also had problems with their other hip joint, and similarly 54.6% of those undergoing knee replacement also stated they had problems with the other knee. Those undergoing hip arthroplasty seemed, in general, not to suffer from knee problems with only 28.6% stating they suffered, and vice versa for the knee arthroplasty patients (18.2%). Only 24 participants (15.6%) stated that they suffered from chronic back or neck problems.

Type of employment and work environment prior to operation

Details on the type of employment, the number of hours participants work per week, and length of time in their current job are detailed in Table 3. The distribution of the type of employment was similar for hip and knee replacement patients. The majority stated that they worked for a 'large' employer (43.5%), with similar numbers saying they worked for medium, small and micro employers, or worked alone (10.4%, 9.1%, 16.2% and 14.3% respectively). As part of their job 20.8% of participants were required to work rotating shifts and 40.3% were required to drive while at work. Overall, 72.7% reported that they had to drive to get to work, (83.1% of knee and 62.3% of the hip replacement groups). A list of all job types is listed in *Appendix 3, Section 2*.

Eighty-six percent were working in their usual role right up to their last day before surgery. Those who did not work in their usual role were either working reduced hours or had amended work duties. The majority (72.1%) made no changes to their workplace in the 6 months before their operation. Further detail about the work habits of participants prior to surgery is given in *Appendix 3, Section 2*.

Table 3: Employment details for participants in the cohort study

	Hip (n=77)	**Knee (n=77)**	**Total (n=154)**
Which of these best describes your usual work? n (%)			
Employed full time	29 (37.7)	30 (39.0)	59 (38.3)
Employed part time	21 (27.3)	17 (22.1)	38 (24.7)
Self employed	17 (22.1)	20 (26.0)	37 (24.0)
Unpaid work	7 (9.1)	8 (10.4)	15 (9.7)
Other	2 (2.6)	1 (1.3)	3 (2.0)
Missing	1 (1.3)	1 (1.3)	2 (1.3)
Number of hours worked each week:			
Employed full time	N=28	N=30	N=58
Mean (SD)	43.6 (11.5)	43.4 (11.3)	43.5 (11.3)
Median (Q1, Q3)	40 (37, 48)	38 (37, 45)	39 (37, 48)
(min, max)	(26, 80)	(33, 84)	(26, 84)
Employed part time	N=21	N=17	N=38
Mean (SD)	21.1 (6.4)	20.9 (15.8)	21.0 (11.4)
Median (Q1, Q3)	20 (16, 25)	20 (14, 21.5)	20 (15, 25)
(min, max)	(10, 32)	(2, 75)	(2, 75)
Self employed	N=13	N=17	N=30
Mean (SD)	40.6 (24.3)	41.9 (19.0)	41.3 (21.1)
Median (Q1, Q3)	45 (22, 55)	50 (30, 50)	45 (22, 55)
(min, max)	(2, 84)	(6, 78)	(2, 84)
Unpaid Work	N=7	N=5	N=12
Mean (SD)	11.3 (6.0)	31.8 (21.7)	19.8 (17.4)
Median (Q1, Q3)	12 (5, 18)	20 (18, 50)	16.5 (9, 19)
(min, max)	(4, 18)	(11, 60)	(4, 60)
How long have you worked at your current job?(years)	N=38	N=37	N=75
Mean (SD)	13.4 (11.2)	12.3 (12.6)	12.8 (11.9)
Median (Q1, Q3)	10.2 (4.3, 20.3)	8 (4, 15.9)	9.5 (4.1, 16.8)
(min, max)	(1.1, 50.8)	(0.8, 61.1)	(0.8, 61.1)

Workplace sickness policy

The majority of participants (57.8%) did not have any periods of sick leave in the six months before their operation. Of those that did, they reported having an average of 4.3 periods of sick leave due to their hip/knee, and an average of 1.7 periods of sick leave for other reasons. On average they took 13.1 days leave because of their hip/knee (range 0 to 90), and 4.6 days for other reasons (range 0 to 60). Around half of the participants were aware of the sickness policy for their workplace. Approximately a quarter said they would receive statutory sick pay, and a quarter said they would receive employer based sick pay, however around a fifth of participants stated they did not know about their sickness pay. The most common length of sickness payment was for greater than 6 months; however, the majority of respondents (36 of 92, 39%) were unaware of how long they would receive sickness payments for. Further details can be found in *Appendix 3, Section2*.

Workplace Design Questionnaire and Workplace questionnaire

A summary of these responses can be found in *Appendix 3, Secion2*. Responses suggested patients had autonomy to structure how they worked. For questions relating to work ergonomics and work demands 60% of participants agreed or strongly agreed that their seating arrangements in their job were adequate, 61% of participants agreed or strongly agreed that their work place accommodated size differences between people in terms of clearance, reach, eye height, leg room etc. Only 30% of participants agreed or strongly agreed that their job involved excessive reaching. Approximately half of participants felt their job was physically demanding. Overall 44% agreed or strongly agreed that their job required a great deal of muscular endurance, 37% that their job required a great deal of muscular strength and 51% that their job required a lot of physical effort.

The majority of participants reported that they felt their workplace gave them the opportunity for social interaction and that the people they worked with were friendly and supportive. Overall 72% agreed or strongly agreed that they had the opportunity to develop close friendships in their job, and 88% that their job gave them the chance to get to know other people. While 75% of participants agreed or strongly agreed that the people they worked with took a personal interest in them and 88% that the people they worked with were friendly, only 60% stated that their supervisor was concerned about the welfare of the people that worked for them.

Expectations of recovery after surgery

At baseline, participants thought they would be back in work after an average of 9.5 weeks post-surgery (range 1 to 68 weeks). Similarly, the average time they thought their employer would be happy for them to return was 9.6 weeks post-surgery (range 0 to 78 weeks). In terms of their usual activities, participants stated that they expected to be performing these on average 9.3 weeks post-surgery, slightly earlier than returning to work, and on average expected to be driving after 6.3 weeks.

Baseline Health Measures

<u>PHQ-9</u>

147 (95.5%) participants completed the PHQ-9 and the average score was 5.4 (range 0 to 24). The hip replacement participants had a slightly higher mean score of 5.9 compared to knee replacement participants (4.9) but both were within the 'mild' depression category.

<u>GAD-2</u>

The GAD-2 was completed by 148 (96.1%) participants. Over 50% reported that they never felt nervous, anxious or on edge and over 60% stated they had never felt uncontrollably worried. However, approximately 10% did experience these symptoms more than every other day. A follow-up question was asked relating to how these problems affected their work, home and personal lives;

42.9% stated these things weren't made difficult at all, with only 3.3% saying things were made extremely difficult by their anxiousness and worrying.

Oxford Hip and Knee Scores (OHS/OKS)
Scores were calculated for 148 (96.1%) of the participants at baseline with an average score of 19.2 for hip patients and 20.9 for knee (range 6 to 44) which relates to 'moderate to severe' hip/knee problems.

Brief Resilience Scale
One hundred and forty-eight participants had valid responses for this questionnaire with the average score 3.03, which falls just into the range for normal resilience (3.0 to 4.3). There was one participant who had high resilience, 106 with normal (71.6%) and 40 with low resilience (27.0%). The results for this measure were similar between hip and knee participants.

Further information about the baseline health measures for the cohort participants is presented in *Appendix 3, Section 2.*

4.4.1.3 Follow-up data

Follow-up rates
All participants who had not withdrawn from the study were followed-up at week 8 and week 16, however a subsample of participants were followed up 24 weeks post-surgery. In total 148 participants were provided with week 8 questionnaires (73 hip and 75 knee), 139 for week 16 (70 hip and 69 knee), and 87 for week 24 which consisted of 51 from South Tees and 36 from Nottingham (41 knee and 46 hip participants) Figure 7 and Table 4. These two sites were the first to open for OPAL, the participants reached week 24 first and became the subsample at this time point. This differs from the plan of including only 45 participants as stated in the protocol. It can be seen that 83.8% of the participants replied to at least one of the follow up questionnaires; the average response rate to the follow-up questionnaires was 61.6%.

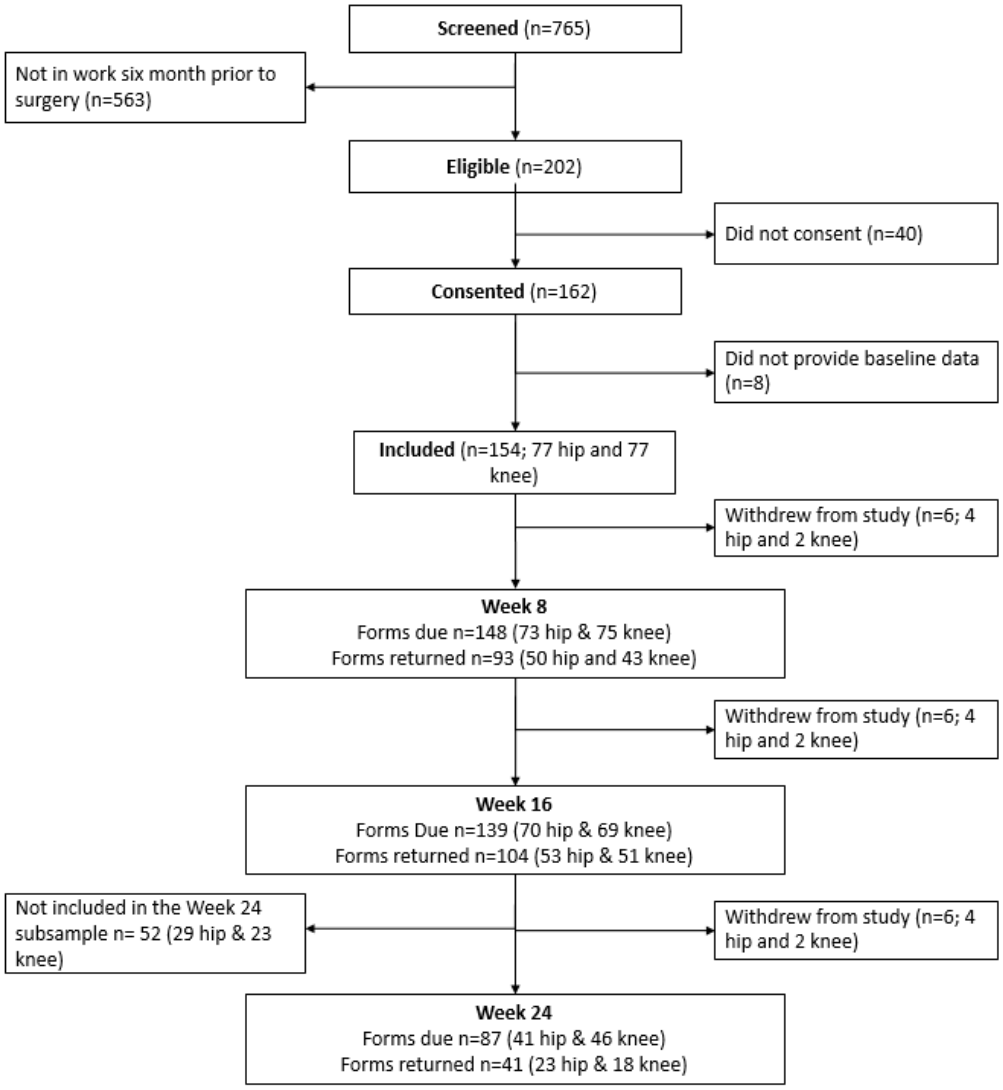

Figure 7: Flow of patients through the cohort study

Table 4: Cohort study returned questionnaires

	Hip		Knee		Total	
	Number Sent	**Number Returned (%)**	**Number Sent**	**Number Returned (%)**	**Number Sent**	**Number Returned (%)**
Time point:						
Baseline	80	77 (96.3)	82	77 (93.9)	162	154 (95.1)
Week 8	73	50 (68.5)	75	43 (57.3)	148	93 (62.8)
Week 16	70	53 (75.7)	69	51 (73.9)	139	104 (74.8)
Week 24	41	23 (56.1)	46	18 (39.1)	87	41 (47.1)
Completed at least one follow up questionnaire [a]		65 (84.4)		64 (83.1)		129 (83.8)

[a] Percentage given out those who completed baseline, n=154

Oxford Hip and Knee Score
The OHS/OKS raw-scores and a categorised representation are found in *Appendix 3, Section 2.*

At week eight 93 participants completed the questionnaire (62.8% of those who were sent the questionnaire) and the average score was 33.6 for hip and 28.3 for knee participants. This increased to 38.6 and 54.1 at week 16 and remained similar at 24 weeks (Table 4). The proportions of participants that were classified as 'satisfactory' increased from 1.3% at baseline, to 19.4% at week 8 and to 45.2% at week 16 (*see Appendix 3, Section* 2). Similarly the proportion of those classified their joint symptoms as 'severe' decreased from 49.4% at baseline to around 6% at week 16.

Return to work, normal activities and workplace productivity
Only 78 (50.6%, 37 hip and 41 knee) indicated that they returned to work within their period of follow-up. Of these 74 (94.9% of returnees, 48.1% of entire cohort) provided a return date, allowing for time between surgery and return to work to be calculated. On average, those who did return did so 10 weeks after surgery, ranging from 1 to 27 weeks. Return times are presented in figure 8, and detailed in table 5, for those who returned to work, and those classified as early-returners.

At 8 weeks follow up, 27 of the 93 (29%) respondents had returned to work (12 for hip and 15 for knee replacements). Fifty-six (60.2%) respondents had not yet returned to work but intended to and 9 (9.7%) stated they no longer intended to return to work. At 16 week follow up 47 of the 103 (45.6%) stated they had returned to work in the last eight weeks (23 for hip and 24 for knee); 17 (16.5%) had not yet returned to work but intended to and 9 (8.7%) stated they no longer intended to return to work.

Table 5: Length of time (weeks) after surgery participants returned to work

	Hip (n=77)	**Knee (n=77)**	**Total (n=154)**
Time for those participants who returned to return to work, weeks	N=36	N=38	N=74
Mean (SD)	9.7 (5.5)	10.3 (5.4)	10.0 (5.4)
Median (Q1, Q3)	8.5 (6.2, 13.1)	10 (6.3, 13.1)	9.4 (6.3, 13.1)
(min, max)	(1, 26.9)	(1.9, 27)	(1, 27)
Time for those participants who returned early* to return to work, weeks	N=8	N=9	N=17
Mean (SD)	3.6 (1.8)	3.9 (1.3)	3.8 (1.5)
Median (Q1, Q3)	4.5 (1.9, 5)	4.4 (3, 4.7)	4.4 (2.7, 5)
(min, max)	(1, 5.4)	(1.9, 5.7)	(1, 5.7)

*Early return was defined as returning in six weeks or less.

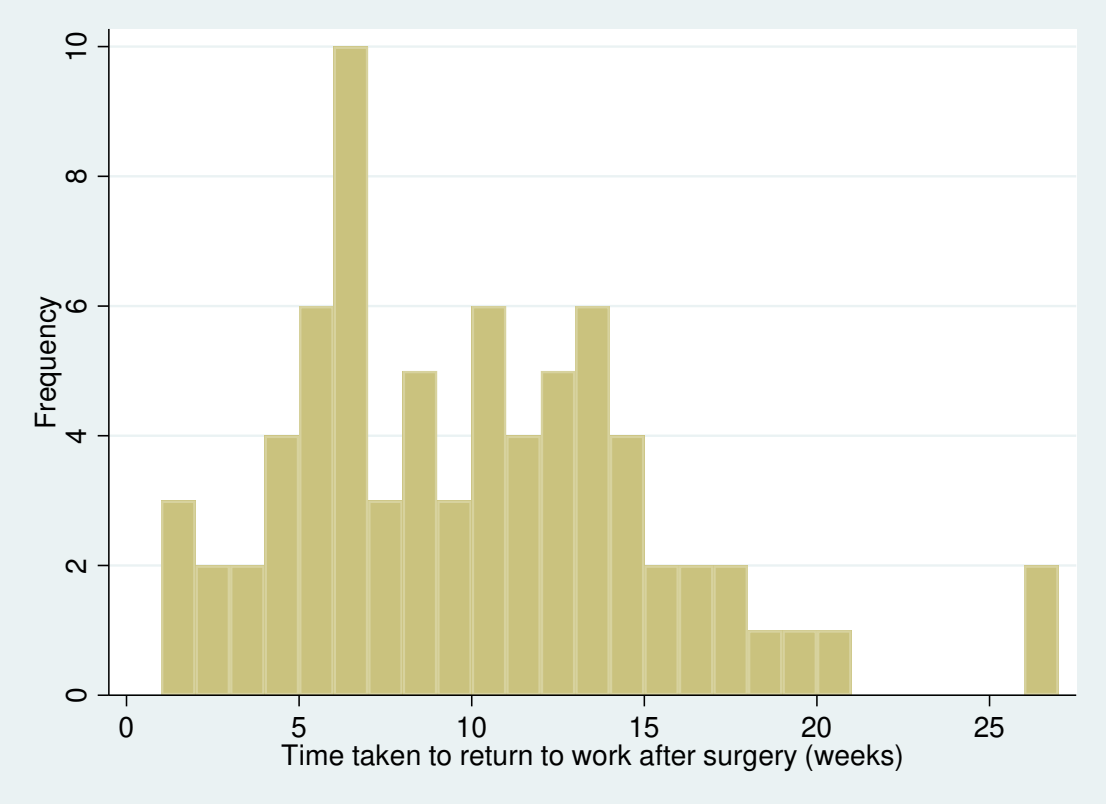

Figure 8: Time to return to work after surgery. Note: Two participants returned their 24 week questionnaires late

Returning to work and use of fit notes

When returning to work, 48.7% of the 78 who returned stated that they were doing their usual hours and duties in their first week, and a similar percentage (47.4%) returned on amended duties or hours. For those who had returned on reduced hours, the average amount of time worked in their first week back was 16.3 hours (range 3 to 40). This is around half of the average amount of time worked before their operation - 34 hours (range 6 to 65). When asked about adaptions that had been made to their workplace and alterations to their pattern of work, only 16.7% and 28.2% respectively, said that any changes had been made.

Based on the workplace limitations questionnaire, the average productivity loss in the 2 weeks prior to surgery was 30.4% for THR (SD 34.1, range 0 to 100) and 24.2% for TKR (S.D 31.7, range 0 to 100). For the patients that had returned to work after surgery this had reduced to 19.7% and 5.1% for THR and 11.1% and 5.6% for TKR at 8 weeks and 16 weeks post-surgery respectively (Table 6).

Around half (50.5%) of those responding at week 8 stated that they had been given a fit note after their operation. The majority of these fit notes stated that the participant was not fit for work (87.2%) or may be fit to work taking into account a phased return (8.5%). Very few of these fit notes (n=1 at 16 weeks) stated that amended duties may be needed. The mean length of the first fit note supplied to patients post-surgery was 5.6 weeks (range 2 to 10 weeks) and was similar for hip (5.7 weeks) and knee (5.4 weeks) patients.

Further detail about the mode of return to work and fit notes provided are detailed in *Appendix 3, Section 2.*

Table 6: Workplace participation questionnaire data for the cohort participants at each time point

	Hip (n=77)	Knee (n=77)	Total (n=154)
Percentage of time lost:			
Baseline	N=54	N=55	N=109
Mean (SD)	40.1 (19.4)	38.6 (18.7)	39.4 (19.0)
Median (Q1, Q3)	40.0 (25, 56.3)	37.5 (21.9, 53.1)	39.3 (25, 53.1)
(min, max)	(3.6, 93.8)	(0, 75)	(0, 93.8)
Week 8	N=9	N=15	N=24
Mean (SD)	16.3 (13.8)	17.2 (15.3)	16.8 (14.5)
Median (Q1, Q3)	12.5 (9.4, 21.9)	16.7 (3.1, 25)	16.7 (3.1, 25)
(min, max)	(0, 39.3)	(0, 50)	(0, 50)
Week 16	N=33	N=27	N=60
Mean (SD)	16.9 (17.7)	16.6 (15.2)	16.8 (16.5)
Median (Q1, Q3)	10.7 (4.2, 28.1)	12.5 (3.1, 28.1)	11.6 (3.3, 28.1)
(min, max)	(0, 58.3)	(0, 57.1)	(0, 58.3)
Week 24[a]	N=14	N=12	N=26
Mean (SD)	16.8 (17.8)	23.1 (20.4)	19.8 (18.9)
Median (Q1, Q3)	13.4 (3.1, 21.9)	21.9 (3.1, 37.5)	14.3 (3.1, 37.5)
(min, max)	(0, 53.1)	(0, 62.5)	(0, 62.5)

[a] Only 87 participants were invited to fill in a week 24 questionnaire

Returning to driving and normal activities

At week 16, 58 of the 79 (73.4%) had returned to driving when expected – at baseline this was estimated to be 6 weeks. Similarly, 48 of 85 (56.6%) said they had returned to normal activities when they expected to – around 9.3 weeks as stated at baseline.

Access to occupational advice

Overall 44 (28.6%) participants reported having access to an occupational health service through their employer at baseline. However, when asked at week 8, only 36 (23.4%) participants stated that they had received advice about returning to work post-surgery. For those participants who received advice it came from a variety of sources including surgeons, GPs, occupational health teams, physiotherapists, occupational therapists and employers (*see Appendix 3, Section 2*).

Predictors of return to work

Since only 78 participants returned to work within our follow-up time frame, 74 of which provided a return date, the number of variables to be included in the model was limited. Factors including age, gender, BMI, ethnicity type of employer, number of hours worked and standardised outcome measures showed little or no evidence of predicting return to work. Size of employer, specially working for a micro-employer, showed a sign of prediction when used solely in a model; however when other factors were also included, these became non-statistically significant (s*ee Appendix 3, Section 3*).

Although other papers found factors that were predictive within this population[42, 44, 48, 136], our lack of predictive factors may be due to the relatively small sample size. Given the low numbers, no further statistical analyses were undertaken.

4.4.2 Health Economics

Resource use and total costs

The health care resource use within table 7 refers to use relating to participants' joint replacement. Resource use relating to 'another' reason is reported in *Appendix 3, Section 3*. Participants predominantly visited health services in relation to their joint replacement, with low average resource use overall for 'another reason'. The most commonly used resources for joint replacements were GP visits, physiotherapist attendances (both hospital and non-hospital), inpatient nights in hospital and outpatient attendances. The most notable resources for those who visited for 'another reason' were GP visits and nurse visits (both at the GP practice), physiotherapist visits (hospital and non-hospital), inpatient nights in hospital and outpatient attendances.

Table 7: Mean resource use, based on all available cases (in relation to your joint replacement)

	Hip (n=77)			Knee (n=77)		
Type of resource use	Mean (SD)	Missing (%)		Mean (SD)	Missing (%)	
GP visits at GP practice						
Baseline*	1.30 (3.85)	8	10.4%	0.58 (0.96)	11	14.3%
8 weeks	0.32 (0.66)	30	39.0%	0.28 (0.64)	37	48.1%
16 weeks	0.20 (0.63)	32	41.6%	0.43 (0.90)	33	42.9%
24 weeks**	0.19 (0.40)	20	48.8%	0.06 (0.24)	29	63.0%
GP visits at home						
Baseline	0.02 (0.12)	11	14.3%	0.02 (0.13)	14	18.2%
8 weeks	0.00 (0.00)	32	41.6%	0.00 (0.00)	37	48.1%
16 weeks	0.00 (0.00)	32	41.6%	0.02 (0.15)	34	44.2%
24 weeks	0.00 (0.00)	20	48.8%	0.00 (0.00)	29	63.0%
Nurse visits at GP practice						
Baseline	0.21 (0.60)	11	14.3%	0.16 (0.51)	13	16.9%
8 weeks	0.41 (0.58)	31	40.3%	0.36 (0.67)	38	49.4%
16 weeks	0.13 (0.40)	31	40.3%	0.29 (0.99)	35	45.5%
24 weeks	0.05 (0.22)	20	48.8%	0.06 (0.25)	30	65.2%
Community nurse visits at home						
Baseline	0.06 (0.38)	10	13.0%	0.05 (0.38)	14	18.2%
8 weeks	0.80 (4.20)	32	41.6%	0.20 (0.60)	36	46.8%
16 weeks	0.20 (0.73)	22	28.6%	0.30 (1.55)	34	44.2%
24 weeks	0.00 (0.00)	20	48.8%	0.12 (0.49)	29	63.0%
Occupational therapist visits						
Baseline	0.55 (0.79)	11	14.3%	0.25 (0.53)	12	15.6%
8 weeks	0.13 (0.34)	32	41.6%	0.18 (0.51)	38	49.4%
16 weeks	0.13 (0.34)	11	14.3%	0.00 (0.00)	34	44.2%
24 weeks	0.05 (0.22)	20	48.8%	0.18 (0.33)	29	63.0%
Physiotherapist visits						
Baseline	1.06 (2.34)	8	10.4%	0.82 (2.20)	11	14.3%
8 weeks	0.87 (1.43)	33	42.9%	3.68 (2.44)	37	48.1%
16 weeks	0.89 (1.69)	33	42.9%	2.32 (2.61)	33	42.9%
24 weeks	1.43 (3.23)	20	48.8%	0.76 (1.71)	29	63.0%
Other health service visits						

Baseline	0.45 (0.97)		13	16.9%	0.25 (0.53)		13	16.9%
8 weeks	0.27 (0.65)		32	41.6%	0.18 (0.39)		38	49.4%
16 weeks	0.16 (0.57)		34	44.2%	0.17 (0.66)		35	45.5%
24 weeks	0.14 (0.36)		20	48.8%	0.12 (0.33)		29	63.0%
Inpatient nights in hospital								
Baseline	2.34 (4.21)		7	9.1%	1.66 (1.46)		13	16.9%
8 weeks	2.61 (3.19)		28	36.4%	2.12 (1.82)		35	45.5%
16 weeks	1.19 (2.11)		30	39.0%	1.13 (1.44)		31	40.3%
24 weeks	0.86 (1.56)		20	48.8%	0.78 (1.22)		28	60.9%
Day case visits to hospital								
Baseline	0.22 (1.05)		12	15.6%	0.08 (0.42)		17	22.1%
8 weeks	0.00 (0.00)		30	39.0%	0.03 (0.16)		39	50.6%
16 weeks	0.12 (0.55)		33	42.9%	0.12 (0.55)		35	45.5%
24 weeks	0.00 (0.00)		21	51.2%	0.00 (0.00)		30	65.2%
Outpatient attendances								
Baseline	1.34 (2.22)		10	13.0%	0.87 (1.10)		17	22.1%
8 weeks	1.06 (0.94)		30	39.0%	0.74 (1.08)		39	50.6%
16 weeks	0.64 (0.85)		30	39.0%	0.60 (0.66)		34	44.2%
24 weeks	0.57 (0.68)		20	48.8%	0.24 (0.44)		29	63.0%
A&E visits								
Baseline	0.07 (0.36)		10	13.0%	0.07 (0.31)		17	22.1%
8 weeks	0.04 (0.21)		22	28.6%	0.05 (0.23)		40	51.9%
16 weeks	0.02 (0.15)		22	28.6%	0.05 (0.21)		34	44.2%
24 weeks	0.05 (0.22)		21	51.2%	0.00 (0.00)		29	63.0%
Physio hospital attendances								
Baseline	0.74 (2.73)		27	35.1%	0.44 (1.17)		15	19.5%
8 weeks	0.93 (1.08)		31	40.3%	3.21 (2.58)		38	49.4%
16 weeks	0.82 (1.67)		32	41.6%	1.60 (2.13)		35	45.5%
24 weeks	1.00 (3.16)		21	51.2%	0.41 (0.80)		29	63.0%
No. patients who received RTW advice from:***	Occupational health	Employer			Occupational health	Employer		
Baseline	4	3	5	6.49%	7	5	6	7.79%
8 weeks	2	2	2	2.60%	0	4	7	9.09%
16 weeks	4	5	9	11.7%	1	2	8	10.39%
24 weeks	2	2	6	14.63%	0	1	2	4.35%

* At baseline (and at all follow-up points), participants were asked to record resource use over the past 8 weeks; ** At 24 weeks, 41 hip participants and 46 knee participants were sent questionnaires; *** the missing data reported for the RTW advice questions are for the overall question which asked, “Have you received any advice about returning to work following your operation?”. As part of this question, patients could select multiple options (i.e. for GP, surgeon, occupational therapist, physiotherapist, occupational health, employer and other).

The total average costs for each item of resource use based on all available cases (for participants' joint replacement) are summarised in Table 8. Average costs based on all available cases (for 'another reason') and based on cases with complete data at 16 weeks in can be found in *Appendix 3, Section 3*. The key cost driver was inpatient hospital stay, in addition to a lesser extent outpatient attendances, physiotherapy hospital attendances and (non-hospital) physiotherapist visits, although physiotherapist costs were lower for hip than knee replacement patients.

Table 8: Summary of costs accrued at 8 weeks and 16 weeks (in relation to your joint replacement)

	Hip (n=77)				**Knee (n=77)**			
	Baseline to 8 weeks		**8 weeks to 16 weeks**		**Baseline to 8 weeks**		**8 weeks to 16 weeks**	
Cost item	Mean Cost (£) (SD)	N	Mean Cost (£) (SD)	N	Mean Cost (£) (SD)	N	Mean Cost (£) (SD)	N
GP visits at GP practice	11.94 (24.79)	47	7.48 (23.4)	45	10.29 (23.94)	40	16.15 (33.64)	44
GP visits at home	0.00 (0.00)	45	0.00 (0.00)	43	0.00 (0.00)	40	2.18 (14.27)	43
Nurse visits at GP practice	4.48 (6.30)	46	1.42 (4.35)	46	3.89 (7.25)	39	3.10 (10.79)	42
Community nurse visits - home	30.76 (161.41)	45	7.69 (27.92)	45	7.50 (23.10)	41	11.63 (59.65)	43
Occupational therapist visits	6.27 (16.16)	45	6.13 (16.00)	46	8.44 (23.80)	39	0.00 (0.00)	43
Physiotherapist visits	49.79 (82.41)	46	50.75 (96.61)	44	210.42 (139.88)	40	132.73 (149.60)	44
Other health service visits	19.76 (48.44)	45	12.06 (42.57)	43	13.30 (28.81)	39	12.35 (48.88)	42
Inpatient nights in hospital	1058.84 (1291.93)	49	482.95 (856.26)	47	858.92 (739.33)	42	458.21 (583.39)	46
Day case visits to hospital	0.00 (0.00)	47	0.00 (0.00)	44	35.97 (221.74)	38	162.73 (751.87)	42
Outpatient attendances	154.80 (137.06)	47	92.88 (122.97)	47	107.22 (157.54)	38	87.98 (96.00)	43
A&E visits	7.13 (33.41)	45	3.56 (23.90)	45	8.67 (36.75)	37	7.46 (34.16)	43
Physio hospital attendances	51.33 (59.48)	46	45.15 (91.65)	45	175.99 (141.50)	39	87.59 (116.99)	42
Occupational health RTW advice	0.18 (0.87)	48	0.39 (1.25)	44	0.00 (0.00)	36	0.10 (0.66)	43
Employer RTW advice	0.16 (0.79)	48	0.44 (1.25)	44	0.43 (1.24)	36	0.18 (0.83)	43
Total Costs	1425.45 (1494.00)	41	806.08 (1122.92)	32	1324.09 (874.30)	26	1029.15 (1216.09)	34

Health related quality of life outcomes

Over 90% of participants completed the EQ-5D-5L questionnaires at baseline, similarly for hip and knee replacement participants (*see Appendix 3, Section 3* for tabular summaries of the health related quality of life outcome data). At 8-week follow-up, 65% of hip and 55% of knee participants had completed the EQ-5D-5L, and similar proportions at 16 weeks (61% for hip and 58% for knee participants). The 24-week follow-up was completed by 51% hip and 39% knee participants. The majority of participants who had incomplete EQ-5D-5L questionnaires missed out all five responses, 3 had one response missing and one had three responses missing (*see Appendix 3, Section 3*).

The proportion of participants who reported any level of problem (that is, levels 2 to 5) reduced over time for all five dimensions, for both hip and knee participants, with the exception of anxiety/depression which initially reduced at 8 weeks but then increased slightly by 16 weeks for knee participants (*see Appendix 3, Section3)*. The most marked change occurred for the self-care dimension; the proportion who reported any problems reduced from 85% at baseline to 23% at 16 weeks for hip participants.

Utility scores were higher for knee participants than hip participants for all time points, with the exception of the baseline (today) time point. There was an upward trend over time for the utility scores, apart from a slight dip at 24 weeks for hip participants, with utility scores beginning at around 0.3 at baseline and increasing to over 0.7 by 24 weeks follow-up.

The mean baseline EQ-5D-5L visual analogue scale (VAS) scores were 60.0 for hip and 61.6 for knee replacement participants. At 8 weeks and 16 weeks there was an increase in mean score (across both groups), however, there was a slight drop in the 24-week VAS score for hip participants, which is consistent with the utility score findings.

Productivity loss

It was estimated that the mean cost per participant due to productivity loss over the 6 month period prior to surgery was £1,602 (£1,977 for hip, £936 for knee). Converting this to a weekly cost indicates a mean cost due to absenteeism of £62 (SD £102) per week; £76 (SD £125) for hip and £36 (SD £31) for knee replacement patients[135]. For the period following surgery, a cost was attached to the number of days missed from work after the participant's operation, the mean cost (SD) of missed work days was estimated to be £7,761 (£4,367) per hip replacement participant and £8,194 (£4,286) per knee replacement participant. Overall, the mean cost was found to be £7,983 (£4,301) per participant, ranging between £797 and £21,508.

4.4.3 Survey of practice

Responses were received from a total of 152 participants from 59 different public and private health providers across England (n=47), Wales (n=1), Scotland (n=10) and Northern Ireland (n=1). These included 78 surgeons, 20 physiotherapists, 25 occupational therapists and 25 nurse/specialist nurse/extended scope practitioners. A further 4 participants labelled their role as "other" were excluded from the analysis as their role within the hospital orthopaedic team and input in to the orthopaedic surgical pathway was unclear.

General responses

There was variation across the 59 different healthcare organisations in the professionals who were responsible for delivering pre-assessment and pre-operative education prior to surgery. Most of the interactions between healthcare teams and patients occurred either during the patient's outpatient clinic appointment when they were listed for surgery or at pre-assessment/education appointments that typically occurred 2-5 weeks prior to surgery. Only 28 of the 78 (36%) surgeons surveyed reported that they saw their patients again before the day of surgery after they had been listed.

For patients who were in work and intended to return to work, only 20% (n=30) of healthcare professionals reported that these patients were identified as a specific subset in need of additional support and information during their care episode (*see Appendix 3, Section 4*). In total 62% (n=92) reported that this patient group did not receive any additional 'return to work' advice and support during their inpatient stay or after discharge. Overall 131 participants (89%) stated they were confident delivering 'return to work' advice either all or some of the time. However, the majority of these respondents did not routinely offer return to work advice. Overall, 116 (78%) felt an occupational advice intervention was needed.

Specific stakeholder responses

Orthopaedic Surgeons (n=78)

Surgeons reported that 96% (n=75) of their patients received written information (leaflets/booklets) relating to their upcoming joint replacement. However, only 40% (n=31) reported inclusion of information about returning to work within these documents. Eleven surgeons (14%) routinely identified patients in need of return to work advice when they listed them for surgery. However, only nine (12%) routinely offered advice either verbally or as written information. Surgeons were asked how they would respond if their patient asked them for advice about returning to work after surgery. The majority (n=75, 96%) said they would offer verbal advice based on their experience and the patient's circumstances. Only 6 surgeons (8%) said they would offer additional advice in the form of written materials based on local pathways (n=2), referral to occupational therapy or occupational health teams (n=3) or directing the patient to external resources such as those available via the Royal College of Surgeons of England website (n=1).

Physiotherapists (n=20)

Of the 20 physiotherapist respondents, 14 assessed hip patients and 10 saw knee patients pre-operatively. Four physiotherapists (20%) reported giving advice to patients returning to work after surgery as part of their routine practice with a further 9 (45%) willing to offer advice if requested. If asked to provide information 19 (95%) said they would offer verbal advice supplemented by written information in 2 cases (10%) or referral to occupational therapy or occupation health teams in 5 cases (25%).

Occupational Therapist (n=25)

Of the occupational therapy respondents, 22 were involved in the pre-operative assessment of hip replacement patients and 15 in the pre-operative assessment of knee replacement patients. Only 6 (24%) respondents offered routine advice about returning to work and 12 (48%) stated that they would give advice if asked. All respondents said they would offer verbal advice. In 2 cases (8%) the therapists stated that they would also supplement the verbal advice with a referral to occupational health services. No one in the occupational therapy group offered written advice and information.

Nurse/Specialist Nurse/Extended Scope Practitioner (n=25)

Nineteen of the 25 (76%) respondents were involved in the pre-operative assessment and education of patients and remainder (26%) delivered inpatient care. Only 6 of the 19 (32%) respondents who saw patients pre-operatively offered routine advice about returning to work. A further 6 (32%) stated they would give advice if asked. If asked to provide advice it was verbal advice in all cases. Again a small number of respondents stated that they would supplement their verbal advice with either written advice (n=2, 8%) or referral to occupational therapy or occupational health services (n=4, 16%).

Chapter 5: Intervention Mapping stage 1 - Needs Assessment: Patient interviews

5.1 Introduction

The cohort analysis was supplemented by qualitative data from semi-structured patient interviews in order to obtain information about shortcomings with current care, barriers preventing return to work (RTW), how these might be overcome, and how to translate this into an occupational advice intervention.

5.2 Objectives

The patient interviews supported study objectives 1,2,4 and 5 (*see section 1.5, page 25*).

5.3 Methods

Sampling
From the cohort, a purposive sample of 45 patients who intended to RTW following surgery were interviewed at approximately 16 weeks post-surgery. Patients were sampled to provide an equal proportion of participants having had hip or knee surgery, representing a range of work roles and employing organisations. Interviews were conducted by telephone. We had originally planned to interview a subgroup of patients not intending to RTW, however, these did not occur as only three participants met the criteria (see cohort study screening information).

A framework approach was used to design the semi-structured interviews and analyse data[137, 138]. This method is widely used in health research and particularly recommended for use in multi-disciplinary health research teams. As a range of stakeholders groups and patients were to be interviewed, this was therefore an appropriate design. The theoretical framework reflected an essentialist/realist perspective, reporting on the experiences, meanings and reality of the participants, rather than examining the ways in which the broader social context impinges on those meanings. Interview schedules informed by initial piloting with service users were used (*see Appendix 4, Section 1*).

Data analysis
The analysis procedure followed the seven stages proposed by Gale et al[138] : transcription; familiarisation with the interview; coding; developing a working analytical framework; applying the analytical framework; charting the data in the framework matrix; interpreting the data

The patient interviews were conducted by CC, FN (both occupational therapists by background). Both interviewers were experienced in conducting qualitative research, and in relation to the topic of work and health. Interviews were conducted individually and by telephone. This was a pragmatic decision made in order to recruit the intended sample and conduct the interviews within the resources available.

All interviews were digitally recorded and transcribed verbatim and Nvivo 10 was used to manage the data which were analysed thematically. Following familiarisation, the first few transcripts were independently coded by the researchers who conducted the interviews, who then compared, revised and agreed a set of codes and/or categories to form a working analytical framework. This framework was used to code the remaining transcripts. Summarised data was charted into a matrix to facilitate comparison of data across cases as well as codes and categories. Potential themes were identified independently by the interviewers who discussed, revised and agreed the final themes.

Characteristics of patient participants
In total 45 telephone interviews were conducted between 28th February 2017 and 21st July 2017 (mean duration 36 minutes)). The mean age was 59.8 years (Range 43-76 years) with 25 females and 20 males. Twenty interviewees were employed in the private sector, 16 in the public sector, 6 were self-employed and 3 were in unpaid work/carers. Twenty-six patients had undergone hip replacement, 19 had undergone knee replacement. The occupations of the participants are provided in *Appendix 4, Section 2*. Interviews were conducted across all 4 study sites (mean 12 per site (range 8-14)).

5.4 Results

5.4.1 Themes identified from the interview analysis

The following themes were identified relating to return to work after hip and knee replacement:

- Pre-operative context
- Post-operative context
- Advice received
- GP role and fit note
- Barriers and facilitators to return to work
- Perceptions of an occupational advice intervention

5.4.2 Patient interview analysis

Summaries of the analysis for each identified theme (5.4.1) are described below. Direct quotations supporting these themes are provided in *Appendix 4, Section3.*

The preoperative context
Prior to surgery patients reported reduced mobility and pain affected commuting to work and general travel. Although many struggled with driving, none reported being advised not to drive.

Symptoms affected patients' ability to carry out their usual job demands effectively and resulted in considerable discomfort by the end of the day. Pain also affected sleep quantity and quality which impacted on work.

Some workplaces had made adjustments prior to surgery and others had assisted with travel/ parking, or enabled working from home. In other cases colleagues were the main source of support. While medication alleviated some symptoms it could result in sleepiness or concerns about addiction, leading to patients not taking the full dose.

For many, the decision to proceed to surgery was based on health professional recommendation following unsuccessful non-surgical procedures**.** Other patients were motivated by pain, work concerns, the impact on interests/hobbies, and quality of life, and were keen to schedule surgery to accommodate work demands, family commitments and hobbies. Many had not considered the recovery period prior to surgery, whilst others had carried out their own research or gained insights from family/friends.

The postoperative context
There were mixed experiences of the inpatient stay. Problems such as fit notes and medication not being available at discharge, or feeling under pressure to vacate the hospital bed were reported. Some patients received physiotherapy postoperatively whilst others wanted more rehabilitation

than they received. Some organised their own physiotherapy, or had it arranged via their occupational health providers. Others were content to continue with the exercise routine recommended by the hospital.

Many patients were positive about the prospect, or experience, of RTW. Some believed they should not work for at least six weeks. Others intended to return more quickly. Others wanted to wait until fully fit, or expressed uncertainty about RTW due to anxieties about their ability to cope with physical work demands, functional impairments e.g. ability to kneel, fear of harming their new joint, or lack of workplace adjustments. When interviewed some had returned to work sooner than expected, including those who felt bored at home. For others, RTW took longer than expected. For some patients their ability to RTW was dependent on their ability to drive to, and at, work. Public transport was not always practical or accessible. Patients who needed to drive for work either worked from home whilst recovering, had lifts from colleagues, or initially hired automatic vehicles.

Advice received

Pre-surgical advice focused mainly on surgery, the hospital stay and aftercare: it was provided in a variety of formats. Opportunities to share experiences and concerns in preoperative group education sessions were valued.

The majority of patients received advice on driving. Some described having to gain 'permission' from health professionals to resume driving. The duration varied between two and ten weeks. Whether or not the patient was considered safe to drive was based on various measures, including range of movement, general recovery, balance, and insurance policy terms. In many cases the decision was left with the patient as to when they felt sufficiently capable to brake or conduct an emergency stop. Some patients cited prescribed analgesia having a major influence on return to driving, with some reducing the dose in order to feel 'safe'.

Some patients reported being advised to avoid activities such as kneeling. Others were given no restrictions. Not everyone was offered physiotherapy and some were uncertain as to the amount and duration of exercise they should be doing postoperatively. Patients were advised on the duration they were likely to be off work e.g. six, eight or twelve weeks, depending on the type of work, and whether work included driving. Some had been advised that they might not return to their normal work rate until much later, and to consider graded returns. Several patients recalled having helpful discussions about work with clinicians, others had received little advice or information.

Perceptions of the current services were generally positive. Patients found information booklets and education sessions helpful. A number had accessed on-line resources for additional information.

The GP role and Fit Notes

From respondent accounts, the GP role was primarily restricted to identifying the need for surgery and referral to secondary care and some did not feel the GP had a role post-operatively. Making appointments was difficult and many felt they did not have a personal relationship with their GP.

The GP had a role in pain management and analgesia, and in some cases referral for interventions such as rehabilitation. GPs were also active in referring patients for scans and other investigative procedures. This process was sometimes prompt with GPs identifying the problem and referring almost immediately. However, in other cases, GPs referred to patients being 'too young' for joint replacement or that the cost of surgery was too prohibitive to refer. Some patients reported having to be proactive and forceful to be referred. There was little discussion reported between GPs and patients about their work demands.

GPs mainly became involved post-operatively if there were complications. The majority did not consult their GP post-surgery apart from requesting Fit Notes. Most were discharged from hospital with a Fit Note covering the first few weeks of absence with the expectation that the GP would provide subsequent notes. Those not issued a Fit Note on discharge, either due to an oversight or the patient 'forgetting' to request one, had to contact their GP promptly after discharge to obtain one. Most patients requested Fit Notes by phone, to be collected at reception. Few saw their GP face-to-face to discuss their RTW. GPs appeared to be led by the patient as to the duration of absence required, and completed the Fit Note accordingly.

Most Fit Notes completed by the GP were 'not-fit' notes. The work modifications section was rarely utilised, and usually for a phased return, the detail of which was rarely described. The self-employed and contract workers did not require a Fit Note so rarely had contact with the GP post-surgery.

Barriers and facilitators to return to work

Prior to surgery

Some patients made their employers aware of their joint problems prior to surgery. Others felt there was little point until they were actually on the waiting list, particularly if their symptoms were not affecting work. Once listed, it was thought important to give notice to allow the employer to arrange cover. Employers were generally supportive, some actively encouraging patients to undergo surgery. Many participants reported being given time off work by their employer for pre-surgical appointments but others utilised annual leave.

Following surgery

Once the patient was on sick leave, several employers regularly kept in touch with a view to assessing readiness to RTW. In other instances the employee took the initiative giving regular reports on progress and arranging meetings to discuss their return. Company policy often required patients to meet with their line manager/OH prior to RTW, but on some occasions the meeting actually took place after returning. Several patients did not have any workplace contact until they had returned.

Job Demands

The most difficult jobs to return to were those with a significant physical component, for example involving kneeling, bending, climbing, and/or health and safety risks. Some jobs were physically demanding but person-centred involving lifting and handling, for example in a care setting, or child care. Occupations which might appear to be less physically demanding still involved physical components: working in a post office, petrol station or bank could involve considerable moving and handling. Other patients reported issues around prolonged sitting or standing.

Many patients had jobs involving significant travel, either on foot or by car, which meant they had to be fit to drive before RTW. Those employed within family businesses found it easier to adapt job demands as other family members covered for them. The demands of shift working including length of shifts or shift patterns also impacted work ability.

Patients on zero-hours contracts had less control over tasks but were more able to adjust work patterns. Those in small businesses might feel pressurised to RTW quickly, including whilst on crutches. Even those with managerial roles still had environmental hazards to negotiate, for example when accessing construction sites.

Line Management
Many patients were positive about the RTW role played by their line manager. Most reported managers were happy to allow them to decide what they could or couldn't do, and work accordingly. Some patients were managed by members of their family or had managers who they considered friends, leading them to feel more supported than they might otherwise.

Some participants reported being reassured by their line manager that they did not need to rush their RTW and were willing to be flexible. Those with greater experience of managing employees with joint replacement were considered to be more understanding and supportive. Some assisted employees by offering them lifts to and from work. Only one patient reported problems with their line manager.

Policies and procedures
Some participants thought that company policies and procedures delayed RTW, for example having to be seen by occupational health practitioner prior to return or being signed 'fit for work' by their GP, or having limited work modification opportunities.

Sick pay and sick leave
Sick pay could be a major factor in the timing of RTW, particularly when there were limited days of sick pay available before going onto statutory sick pay. In addition, there were concerns that lengthy periods of sick leave might impact on the individual's sickness absence record. Many people balanced the decision to undergo surgery against the duration they could afford to be off work. Those in the public sector were eligible for full pay for up to six months of absence. Other patients negotiated their sick leave with their employer, incorporating annual leave and public holidays in order to cope financially.

Colleagues
Many patients reported their immediate work colleagues were supportive before and after surgery, facilitating their RTW. However, one patient whose job was initially modified but was able to cycle to work felt his colleagues perceived him as 'swinging the lead'. Others reported that colleagues were vigilant, not allowing them to do too much too quickly. Those whose colleagues were also members of their family or friends, felt particularly supported financially and practically.

Work modifications
Some participants stated that their manager was flexible and supportive about RTW plans allowing them to decide on modifications. Others reported that their employer suggested modifications, such as prescriptive phased returns, but these did not necessarily address the employee's needs, resulting in them implementing their own work modifications.
Despite many employers being amenable to employees adopting a phased return to 'ease' them back into the workplace, some did not offer this facility. Some patients had not yet returned to their previous level of work.

Occupational Health (OH)
Several patients had access to workplace OH, particularly in the public sector, either in-house or contracted-in. Opinion was sought on fitness to RTW, safety to drive, work modifications and in some cases, a change of role. OH referrals might also include referral to physiotherapy. Other organisations operated a self-referral policy particularly for patients who had not triggered the sickness absence duration point for automatic referral.

Some patients reported receiving multiple OH assessments both whilst they were off work and on their return. OH was often involved in identifying appropriate changes to the work environment, and in conducting risk assessments. Some patients felt that the wait to see someone from the OH delayed their RTW. Protracted communication between the various parties involved was also reported to cause delays.

OH could be time consuming and inappropriate, or patients felt that they would have benefitted from an onsite assessment. Other patients were only seen by OH after they had returned to work resulting in no initial RTW plan, or one devised by the employee themselves in conjunction with their line manager. Some felt they would have benefitted from greater OH involvement whereas several felt their RTW was managed by their line manager making OH involvement unnecessary. Most felt reassured they could request OH input at any time. However, some preferred not to.

Perceptions of an occupational advice intervention

Perceived need

Many patients thought more occupational advice was needed. Others did not feel it personally necessary, either because they had received sufficient support from their employer, or felt able to manage their own RTW.

Format

While many patients were positive about using online resources, others did not use computers. Even those in computer-based occupations sometimes preferred printed formats to refer to easily and share. Some were unable or unwilling to read or process much written information, and thought that a more personal verbal approach – group/individual, face-to-face/phone – could provide opportunities to ask questions and seek clarification. There was support for enabling employers to access information about the operation and advice given, rather than relying on patient report. Participants thought that employers might have little experience of arthroplasty, postoperative limitations or how to modify work. However, there were concerns over privacy and patient choice regarding information shared with employers.

Content

Patients valued the inclusion of realistic recovery timescales and functional milestones post-surgery to better manage expectations. There was support for work-related advice such as graded returns, modified duties and fit notes. Some felt there should be more opportunities to seek reassurance following surgery, and home exercises.

Delivery

Some believed the GP or surgeon should be the main informant regarding RTW. Others felt physiotherapists were better suited, and that occupational health teams should be involved if available. The information should be delivered by someone knowledgeable in arthroplasty. Many patients would prefer to receive information prior to surgery to aid with decision making and planning. Others believed they would be best placed to use this information post-surgery.

Chapter 6: Intervention Mapping stage 1 - Needs Assessment: Stakeholder interviews

6.1 Introduction

The patient interviews were supplemented by qualitative data from semi-structured stakeholder interviews. Employer, surgeon, GP, AHP and nurse interviews were performed.

6.2 Objectives

The stakeholder interviews supported study objectives 2, 4 and 5 (*see section 1.5, page 25*).

6.3 Methods

Sampling
A sample of eight employers[1] around each site were recruited from organisations of differing sizes and sectors via local employer organisations and contacts. Eligible participants had experience of employees undergoing THR or TKR in the previous 12 months. Data were also collected from hospital orthopaedic teams and local GPs. A sample of twelve orthopaedic surgeons, twelve Allied Health Professionals (AHPs) and nurses, and twelve GPs were interviewed across the sites to provide sufficient diversity of views and experiences. Interviews with these stakeholders were conducted by telephone, face-to-face or in small focus groups. Interview schedules informed by initial piloting with stakeholders were used (*see Appendix 5, Section 1*).

A similar methodology and framework approach (*as described in Chapter 5*) was used

Data analysis
The stakeholder interviews were conducted by CC, FN (occupational therapists by background) and MN (social scientist by background). All interviewers were experienced in conducting qualitative research, and in relation to the topic of work and health. Interviewees were offered face-to-face or telephone interviews, either as a group or individually, according to preference. This was a pragmatic decision made in order to recruit the intended sample and conduct the interviews within the resources available.

Interview conduct
Twenty-five workplace representatives were interviewed, 15 by telephone and 10 face-to-face, between September 2016 and June 2017 (mean duration 36 minutes). Recruitment was extended outside the geographical catchment of the study sites. The characteristics of the participants are listed in *Appendix 5, Section2.*

Twelve interviews were conducted with AHPs and nurses: 6 by phone and 6 face-to-face. The mean interview duration was 52 minutes. Characteristics of the AHP/nurse participants are listed in *Appendix 5, Section2.*

Twelve interviews were conducted with consultant orthopaedic surgeons, (mean duration 51 minutes). One was interviewed by phone, eleven face-to-face, either group or individually. Characteristics of the surgeon participants are listed in *Appendix 5, Section2.*

[1] *The term 'employers' is used in the broadest sense, encompassing a range of individuals within the workplace including managers, human resources, occupational health and colleagues.

Sixteen interviews, 10 by phone, 6 face-to-face were conducted with GPs (mean duration 36 minutes). Characteristics of the GP participants are listed in *Appendix 5, Section2.*

6.4 Results

6.4.1 Themes identified from the interview analysis

The following themes were identified relating to return to work after hip and knee replacement:
Workplace representatives *(N=25)*

- Experiences of accommodating patients undergoing THR and TKR in the workplace
- Barriers and facilitators to return to work
- Perceptions regarding an occupational advice intervention

Clinicians *(Allied Health Professionals (AHPs)/Nurses (N=12) Surgeons (N=12), GPs (N=16))*

- Decision to have surgery and expectations of recovery
- Advising patients about work and other activities
- Barriers and facilitators to return to work
- Perceptions regarding an occupational advice intervention

6.4.2 Workplace representative interview analysis

Summaries of the qualitative analysis are described below. Direct quotations supporting the themes are provided in *Appendix 5, Section 3*.

Experiences of accommodating patients undergoing THR and TKR in the workplace
Some employers reported arranging work modifications for employees prior to surgery. Others would have considered this if advised by the GP rather than signing employees off sick. Employers reported that some employees managed their usual work up until surgery without accommodations, although not necessarily working at full capacity. Employers described how they accommodated employees' RTW. Alternative tasks and/or work areas/locations were provided, in some cases on a permanent basis, which might require additional training. Phased returns, amended duties, and adaptive equipment for manual tasks were organised when needed. Adjustments to office furniture might be made for those in mainly sedentary occupations, or reductions in workload for those with more mentally demanding roles and responsibilities.

Some employers were able to extend cover for the employee if their RTW was delayed or allowed the employee to return as supernumerary. Employees whose work was mainly computer-based were often able to work from home, and accommodations also included travel and parking, and facilitating general mobility within the workplace. Some employees used accrued annual leave to facilitate phased returns. Not all employees had returned to work as anticipated, even with adjustments. This happened for a variety of reasons including recovery taking longer than expected, post-op complications e.g. DVT, being listed for second joint replacement and deciding not to RTW in interim.

Barriers and facilitators to return to work
Occupational Health (OH)
Employers felt organisations with on-site OH could be at an advantage in supporting RTW due to a better understanding of the job demands. OH might help reassure employers they were acting according to best practice. However, there were concerns that OH might have insufficient knowledge of the employees' work tasks and employees might perceive OH negatively and not know what support was available. In some workplaces, all employees undergoing THR/TKR would be

referred to OH, in others referral was at the manager's discretion, and not necessarily before the employee had RTW. OH was reported as helpful by many, although not all valued every OH intervention, but felt it necessary if insufficient medical advice was received.

Some OH departments felt under-resourced and there was a perception that surgeons and GPs were not sufficiently trained in this area.

GPs

Employers reported that support provided by GPs was extremely varied. They thought the GP role was limited by time and expertise, and reliance on the patient for work information. Although fit notes were perceived by some to be of benefit, others felt the information provided was of little help, particularly on work modifications. There were concerns that GPs might be overcautious, could raise an employee's expectations inappropriately, or only consider the employee's current job, rather than potential alternatives.

Concerns were expressed by employers that patients might see the fit note as 'gospel', rather than advisory, although this was also true for employers who might also be reluctant to act against fit note advice. Some wanted GP approval for modifications, others reported paying less attention to fit note advice.

The Employee

Employees' personal characteristics were perceived to help or hinder RTW. Some were keen to RTW as soon as possible – in some cases too early - due to loss of their usual routine, boredom, and difficulty adapting to not being at work. Others were keen to return due to the demands and responsibilities of work, or for reasons of finance or job security. Employees might delay surgery because of anxiety about the operation. Employers recognised it was important to re-establish a work routine as early as possible, and that some employees might be anxious about RTW.

Employers reported that employees in manual jobs might struggle to consider 'lighter duties', or be reluctant to return to tasks which they felt had caused their osteoarthritis. Employee motivation, compliance with rehabilitation and self-management were considered key factors in enabling RTW. Employers stated that some employees needed more active support in recovery. Proximity to retirement was also felt to be a factor, and linked to concerns that RTW might impact on the new joint.

The Workplace

Participants believed the size of an organisation could impact employees' RTW. For example, managers in smaller organisations might be less skilled in the process, have little access to support systems and less experience of surgery. However, even in larger organisations line managers might not be aware of the support available from the organisation. Some larger organisations had on-site rehabilitation services which they perceived could enable line managers to better understand RTWs, with rehabilitation continuing at work.

Employers perceived that smaller organisations might have fewer options for work adjustments and re-organisation of workload. Very large organisations might have set RTW procedures following arthroplasty, or might provide access to physiotherapy or rehabilitation. Office-based and non-manual work roles were seen as easier to return to, although some interviewees perceived that adjustments might also be required for office-based work.

Employers considered larger organisations could cope more easily with lengthy sickness absence, and that employees in smaller organisations/teams might feel less comfortable about taking sick leave because of the demands on colleagues or the business. Employers perceived some organisations might be less supportive than others, and some posts more difficult to provide cover for. Even within the same organisation, employers reported that sick pay arrangements, phased returns or access to health schemes might differ, and impact on RTW.

Surgery

Employers identified a range of factors related to surgery that could help or hinder RTW. These included post-surgical complications, on-going symptoms and after-effects of surgery such as stiffness, pain, swelling, low mood and fatigue. The impact of successive joint replacements on sick leave was also a consideration, and perceptions of insufficient or delayed post-operative care and physiotherapy. NHS delays and cancellations could be a hindrance, however others had not experienced any problems. For large organisations with highly structured RTW policies, the variation in expected duration of sickness absence between different surgeons and Trusts was seen as a potential hindrance.

Perceptions regarding an occupational advice intervention

There was widespread support for an intervention for both employees and employers. Currently employers were reliant on employee feedback; employers might not be aware of the information patients received.

Timing

Many considered the intervention should be initiated prior to the decision to have surgery, to inform and reassure the patient and facilitate RTW planning with their employer. However, others would prefer to wait until after surgery as plans might have to change, for example due to complications.

Format

Some favoured paper-based advice, rather than verbal. The information needed to be of appropriate size and easy to navigate, as some employees might struggle with large amounts to read. Digitally-based information could make information more widely available to staff considering or undergoing joint replacement. Digital methods such as apps would not suit all employees, who might not have a mobile phone or computer. A format that could be shared with the employer, and with the employee's family was supported, and one that other stakeholders could access and contribute to was suggested. There was a view that some employers' anxieties might be raised by too much information.

Having a standardised intervention was seen as beneficial, as current practice might vary between hospitals. A more individualised or personalised approach might be required because of different employee characteristics and circumstances.

Delivery

Some considered surgeons best placed to deliver the intervention, others the GP or rehabilitation professionals and/or someone who could review progress regularly. Others perceived the workplace should have a role in delivering the intervention, and facilitating workplace and healthcare communication.

Content

Advice should include the psychosocial impacts of RTW, such as feelings of isolation, fatigue, loss of identity and confidence, and anxiety. It should guide employees how best to access support from

others in the workplace, including information on attendance reviews and organisational services available to employees.

Employers said they would benefit from access to both generic and individually targeted advice on supporting RTW, including expected timeframes for recovery, milestones, and restrictions. This could include advice on home working, managing unexpected complications and employees with other health conditions, including instances of consecutive joint replacement.

The intervention could include guidance on how organisations recorded sickness absence following surgery and the impact this might have on an employee's absence record and potential job prospects. Existing occupational advice information for other health conditions could be used to inform the intervention.

Measuring impact

Key outcome measures could include RTW itself and days of sickness absence, including prior to surgery. Whether the employee had returned to their usual work, and whether work ability improved following their operation were also important. Reasons why the intervention had been successful or failed were felt to be important, including recording why RTW had not proceeded as planned. The different nature of the individuals' work tasks should be accounted for, and the effect of other individual characteristics, including general health, and their approach to recovery. Evaluation should reflect the perspectives of employees and employers regarding the intervention and RTW process, and the resource implications for the employer.

6.4.3 Clinician interview analysis

<u>The decision to have surgery, and expectations of recovery</u>

Clinicians generally considered that advising patients when to have surgery was complex and outcomes difficult to predict. Patients might delay surgery until they had retired or until their function had deteriorated. With increased knowledge patients might make a more informed decision about surgery in relation to their work situation. Patients' expectations varied, but were often high, especially amongst younger patients. Surgeons perceived their role was to manage and at times intentionally lower these expectations. Employers might also overestimate the speed of recovery. Patients might simply expect relief from pain, others to increase functional activity. It was important to clarify whether patients expected to be able to function as well as – or better than – they were prior to surgery.

Work issues could influence patients' decisions, including pressure of work demands, concerns about sickness absence records, or potential inability to return to their existing role. These factors also impacted on the advice surgeons gave, however, they were unable to guarantee patients' post-operative work ability. Patients' expectations and decision to have surgery could also be influenced by their GP and the referral system, which might impede patients having surgery at an optimum time. Patients might be concerned about joint longevity, although some surgeons perceived these concerns to be unfounded. The timing of surgery in relation to patients' work schedules was important, for example preferences for surgery during holidays or quieter periods. It was not always possible to offer this because of issues around breaching waiting lists.

GPs perceived patients' decisions regarding surgery were often influenced by their friends and family, either positively or negatively. For example, some patients might anticipate a longer recovery timescale than needed. The impact of surgery on work was believed to be a consideration for patients. Anticipated recovery timescales and time away from paid work might dissuade patients

from surgery, particularly the self-employed. Others felt patients were willing to wait until retirement rather than inconvenience their employer, and might tolerate a painful joint if only experienced at work. Staged referrals and effective triage could help mitigate expectations. More accurate information on recovery might encourage patients to have surgery earlier. However, there was a perception from GPs that surgery would only be offered to patients in considerable discomfort or over a certain age.

Most GPs considered their main role to be managing pain and referring patients to physiotherapy and secondary care, and did not consider the provision of occupational advice to be a main responsibility, other than issuing 'sickness certificates'. Many were reluctant to 'interfere with' or 'jeopardise' the patient's recovery. GPs rarely communicated with patients' employers other than through fit notes. GPs were uncertain as to the advice patients actually received from the hospital, and communication from the hospital regarding occupational factors was limited.

Advising patients about work and other activities

Perceptions of roles

Most interviewees had only a superficial understanding of the occupational advice provided by the hospital orthopaedic team, even within their own centre. There was little awareness of fit note provision or of written occupational advice.

RTW interventions were not generally considered the role of the orthopaedic team. The onus was on the patient requesting occupational advice. Interviewees reasoned patients were focused on the operation, or assumed that RTW was not a topic they wished to discuss. They also felt it was difficult to individualise this advice.

The fit note was considered the realm of doctors rather than AHPs or nurses.

Some surgeons reported actively enquiring about patients' occupations as part of the decision to operate however it was not a priority, and the time available in clinic limited opportunities to discuss work. Other members of the team were perceived to have a greater role. Patients were often discharged before they had RTW, so surgeons would not know their work outcomes. Routine follow-up past six weeks was often not thought necessary.

Differing management of THR/TKR patients

Opportunities for patients to receive advice from AHPs and nurses varied. In some hospitals separate pre-operative group education classes were held for THR/TKR patients, in others these were combined and involved different professions. Occupational therapy mainly entailed screening hip replacement patients pre-operatively, and was not provided routinely for knee replacement patients, because they rarely needed adaptive equipment. Post-operative physiotherapy for knee patients was supported, particularly in groups. However patients might be unable to access physiotherapy at the main hospital where they had surgery. Hip patients were unlikely to receive routine physiotherapy post-operatively.

Advice provided

AHPs and nurses frequently referred to occupational management in terms of set timescales of *when* a patient might RTW, rather than *how* they might do this. In some cases these timescales were Trust policies and seen to offer medico-legal protection to staff. Usually staff would defer to the consultant concerning these timescales. Individual advice about work activity was provided on an ad hoc, informal basis. In some cases advice on modified work was given.

Surgeons also referred to 'blanket' RTW timescales - often six and twelve weeks of sickness absence - usually coinciding with follow-up appointments and advice on returning to drive. These timescales appeared to be based on a combination of convenience, clinical reasoning and experience. Advice regarding work could be given verbally to patients, or communicated to other stakeholders by letter or fit note. Surgeons might advise patients whether or not they would be able to do their job following surgery, including considering changing their occupation due to its physical demands, but rarely told patients they should not do a particular job. Surgeons recognised the value of modifications and adjustments, however their advice tended to focus on whether or not someone would eventually return to their job.

Most GPs would consider advising patients on work modifications, however, their confidence to do this was variable.

Communication with other stakeholders

Communication with other stakeholders about RTW was limited. Contact with employers was rare and usually initiated by an organisation's OH provider. Patients were the main conduit of information for employers. Clinic/discharge letters to the GP rarely documented work issues.

Fit notes

Fit notes were issued to patients on request, often by a junior doctor on discharge. These were routinely 'not fit' notes for a duration of six weeks, although patients might be advised they could return earlier if they wished to, and a longer period might be written on request. Occasionally fit notes might be issued post-discharge, but usually this was perceived to be the role of the GP. There was frustration among some GPs when hospital fit notes were not issued at all, or for a very short period. GPs were inclined to rely on the patients to guide fit note completion.

Advice about driving

Hospital staff frequently advised patients on return to driving and reported that this impacted on their RTW. Advice on refraining from driving varied in timescale, but generally coincided with the follow-up appointment, and 'permission' to RTW was conflated by some patients and AHPs/nursing staff with advice on driving and follow-up. Some surgeons routinely advised all patients not to drive for six weeks, others were more flexible. Surgeons felt unable to assess fitness to drive, or used proxy assessments. However no-one else was perceived by surgeons to have the ability to assess this either. There were concerns about litigation and it was considered easier to adhere to a set timescale.

Most GPs perceived that patients should not drive for approximately four weeks postoperatively. They assumed, or expected, that patients would have received advice on driving from the hospital. Patients were referred by GPs to the DVLA website for advice. GPs felt unable to make a decision on patients' ability to drive, and instead relied on the patient, or another healthcare professional, to make this judgement. GPs tended to assume that patients who drove for their job would have this aspect covered by their employer.

<u>Barriers and facilitators to return to work</u>

Workplace

AHPs and nurses believed employers to be generally supportive, but might not see the cost-benefits of supporting an earlier RTW or understand the magnitude of the surgery. Some perceived that limited sick pay facilitated RTW. Patients with 'flexible' employers were more likely to RTW sooner than those who expected employees to return fully fit. They felt sickness absence policies might be a barrier to earlier return.

Surgeons perceived employers could be a barrier to RTW, e.g. using surgery as a reason to terminate employment, and through restrictive sick leave allowances and phased returns, particularly in the private sector. Employers' concerns about health and safety law might impact on RTW forming part of the rehabilitation process. As such they felt employers might respond better to a 'worst case scenario' rather than have their expectations raised by promises of an earlier RTW.

GPs believed that some employers could be very accommodating, particularly if that individual was perceived to make a key contribution to the business, and vice versa. However, modifications were not necessarily easy for the employer and some needed encouragement or additional information. Others were unable or unwilling to make adjustments. Where employers had already made interim staffing arrangements to cover the employee's work they might prefer to wait for the individual to return to full hours and duties. The quality of patients' jobs and work environments was perceived to impact on their motivation to RTW. There was a view that larger organisations were not necessarily more accommodating. Generally GPs felt that most employers facilitated RTW, although were cautious about RTW for any patients undergoing surgery. RTW planning prior to surgery by the employer was seen as a potential facilitator.

Job Demands

Clinicians considered physically demanding jobs necessitated a longer recovery period. Analgesia might preclude some work tasks, but there was a risk that by reducing their analgesia to facilitate RTW, patients might hinder their full recovery.

Occupational Health (OH)

Clinicians believed not all patients had access to OH. Smaller organisations might be in greater need of an occupational advice intervention. However, OH might be out-dated in their management of THR/TKR, and would not necessarily have an in-depth knowledge of the patient's job. OH might be risk-averse and extend sick leave unnecessarily.

GPs encouraged patients to involve OH to facilitate their RTW, although patients might be reluctant if they thought their sickness absence might be scrutinised. Contact between patients and OH might only be made at the point of RTW. GPs believed large organisations would have their own systems in place for managing RTW. In some cases OH might request GP reports on patients' ability to work which GPs found difficult to comment on and doubted the usefulness of their responses.

GP

There was a view amongst orthopaedic clinicians that GPs might delay referral if they believed patients were unlikely to be offered surgery because they were too young, or might refer too early due to patient pressure. Some queried the extent to which GPs would actively use occupational advice with this patient group, and there was a perceived need to educate GPs about THR/TKR.

Patient

Patient characteristics could help or hinder recovery, including age, adherence to recovery advice, comorbidities, social circumstances, recovery beliefs and expectations, interpretation of pain and motivation to RTW. Those who were self-employed or receiving limited sick pay, or believed they were needed at work might be motivated to return earlier – perhaps too early.

Surgery

Postoperative symptoms of pain, swelling and fatigue, and restrictions such as hip precautions or resulting from particular surgical approaches could be a barrier to RTW. The timing of surgery could

be a barrier for patients, for example during busy work periods. Some GPs reported their local hospital had listed patients to fit round work demands.

Resources

All clinicians felt restricted by lack of resources, particularly time, and skillset. There was a perceived lack of rehabilitation and support postoperatively within the hospital and in the community. The demarcation between primary and secondary care was not necessarily helpful for the patient. Triaged referral systems for surgery were perceived to be resource-led, and the reasoning generally understood and supported, although they did not always work well due to waiting lists for physiotherapy.

Perceptions regarding an occupational advice intervention

Perceived need

Hospital staff reported only a small number of patients might need an intervention because they believed most had retired. Some questioned what constituted 'work' e.g. if work was unpaid or for only a few hours per week. Some AHPs/nurses believed employed patients were unlikely to be working to their full capacity before the operation, and therefore did not consider providing an occupational advice intervention necessary. Being over a certain age might automatically be conflated by GPs and hospital clinicians with not working. There was uncertainty as to whether there would be a future increase in the proportion of patients in work. Some considered current practice was meeting patients' needs, or that only those in more physically demanding occupations would need an intervention. Providing occupational advice was not seen as a priority, and that sufficient RTW plans were usually in place. Providing an occupational advice intervention might require increased resources, and existing service level agreements could limit the extent of support available from the hospital team.

Advising on work was considered difficult because of variation in patients and their jobs, and a belief that the NHS was unable to offer work rehabilitation. Increasingly clinicians felt they had less time to spend with individual patients. Some believed patients were able to access RTW support through OH or already received sufficient occupational advice and support from the hospital orthopaedic team. Others implied that providing occupational advice and support was 'common sense' or believed most patients were able to RTW.

Several GPs thought that patients would benefit from further occupational advice, others that current care was adequate.

Timing

Some believed the intervention should start in primary care, however the GP would not necessarily know whether the patient would be listed for surgery, or have a good understanding of THR/TKR. Some thought it should start at listing for surgery, or the first clinic appointment. Others felt this was too early as patients did not always focus at the consultation, and considered the pre-assessment period best. However this would depend on the timing of the appointment. Others thought the intervention could start much later in the process, or should vary according to the patient's circumstances. GPs perceived some patients might have difficulty in focusing past the operation itself. There was uncertainty as to how long the intervention should last, and whether every patient might need it.

Some suggested a postoperative element to the intervention with the facility for one-to-one communication between patients and hospital staff.

Format
Patient age, literacy and access to on-line resources needed consideration. There might be a limit to what patients would retain in a group educational setting, although it provided an opportunity for interaction. Patients could be given a booklet to bring to appointments that other stakeholders could contribute to (e.g. similar to the Red Book) but might forget to bring it and stakeholders might not have time to complete it. The use of currently available 'joint replacement' help-lines could be extended to include work issues. Some believed an individualised approach was essential.

On-line information was considered a useful option, preferably tailored to the local service. A format that patients could refer to easily was important, reinforced as necessary, and accessible to all stakeholders. Delivering an individually tailored intervention was considered difficult in practice, but potentially of value to the NHS and to employers. Where possible it would be helpful to communicate advice about individual patients, for example in clinic/discharge letters, and information about the patient's occupation could be included on the referral from the GP to secondary care.

Content
Hospital clinicians suggested the intervention include advice for manual and non-manual work demands, phased returns and general examples of recovery. Individual cases could be used to illustrate examples. GPs suggested information about OH, complications, restrictions, signposting, advice lines, negotiating modifications with employers, medication and work, and symptom management. As patient recovery rates were variable, GPs felt providing an individualised intervention would be difficult. However, information on expected general milestones would be useful to both patient and GP.

Delivery
Some believed the intervention was best delivered by physiotherapists, occupational therapists or nurses. Others perceived the intervention should be delivered by a member of staff with sufficient time, knowledge and skills, and who saw the patient regularly. Information booklets, provided by surgeons in clinic, could also help deliver information and advice to patients. Most GPs thought the intervention should be delivered through secondary care, but professional background was less important than the required time and skills. The reinforcement of messages was important.

Measuring the impact of the intervention
Measurement could include comparing pre and post-operative work status, the timeframe for RTW, relapse, use of analgesia, whether expectations were being met, patients' perception of their RTW and the extent to which the intervention was used. Some surgeons believed a successful operation and discharge remained the most important outcome. The timing and circumstances surrounding data collection might impact on results. GPs considered qualitative assessment of the intervention to be important and the numbers of patients returning to full, sustained work.

Chapter 7: Intervention Mapping stages 2 and 3 - Identification of intended outcomes and performance objectives (PO) and Selection of theory-based methods and practical strategies

7.1 Introduction

Intervention mapping stages 2 and 3 used the information from the needs assessment (IM stage 1) to develop provisional performance objectives (PO) for the occupational advice intervention and select theory-based methods and practical strategies to support their development.

7.2 Objectives

Intervention mapping stages 2 and 3 supported study objective 8 (*see section 1.5, page 25*).

7.3 Summary of what was learned from IM stage 1

Prior to commencing IM stages 2 and 3, the investigators summarised the key information developed from IM stage 1. This information was summarised based on the PICO format to mirror the knowledge gaps discussed in *Chapter 1*. Illustrative examples covering the 'key' information are given below referenced against the source of evidence from IM stage 1 (please note this is not an exhaustive list). This information formed the basis for developing the first draft of the performance objectives for the proposed intervention in IM stages 2 and 3.

POPULATION: The return to work population

The need for a return to work intervention

- A substantial proportion (up to 25%) of patients are in work prior to surgery, including some past state pension age. **(COHORT)**
- A minority of patients have access to occupational health services and knowledge about employer sickness policies and sick pay is poor. **(COHORT AND INTERVIEWS)**
- A considerable proportion of patients return to work by 16 weeks, either to their usual job and/or amended hours and/or duties. **(COHORT)**
- While a significant proportion of patients might benefit from an occupational advice intervention, 'standard care' is currently sufficient to get the majority of patients back to work after surgery. **(COHORT and INTERVIEWS)**

Characteristics of the return to work population

- Many patients are in full-time employment, in physically demanding roles and often at work until the day before surgery. **(COHORT)**
- Most patients need to drive, either to, or at, work. **(COHORT)**
- Patients report, and stakeholders perceive that patients/employees often have a strong motivation to undergo joint replacement to improve their quality of life, reduce pain and continue work. **(INTERVIEWS)**
- Some patients are keen to return to work as soon as possible, sometimes too early (particularly the self-employed) and struggle to consider 'lighter duties'. **(INTERVIEWS)**
- Only around a half of patients are provided with a fit note and most are given by the patient's GP. The majority of fit notes prescribe the patients as 'not fit for work' for six weeks. **(COHORT)**

Expectations of patients and healthcare teams

- While some patients want to be fully fit before returning to work others are happy to return on a phased or amended return while they continued to recover. **(INTERVIEWS)**
- Patients expect to be off work for between two and three months after surgery. **(COHORT)**
- Many do not want to inconvenience their employer. **(INTERVIEWS)**
- There is an overall perception amongst clinicians that return to work is a realistic goal for the majority of patients undergoing joint replacement. However, expectations need to be managed carefully. **(INTERVIEWS)**

Perceived barriers and facilitators to return to work

- The motivation of the employee is a key factor in returning to work; and compliance with rehabilitation and self-management of health. **(INTERVIEWS)**
- Patients feel their employment status and need to remain in employment are not fully taken into consideration in the surgical decision-making process. **(INTERVIEWS)**
- Patients often do not consider the impact surgery will have on their ability to work until they are listed for surgery. **(INTERVIEWS)**
- Workplaces are generally able to accommodate patients' needs for workplace adaptions and changes in working patterns. The majority of patients have some autonomy over how their work is planned. **(COHORT AND INTERVIEWS)**
- Office-based and non-manual work roles are considered easier to return to. The use of analgesia might preclude some work tasks. **(INTERVIEWS)**
- Employers concerns about health and safety and potential litigation might impact on return to work. **(INTERVIEWS)**
- Return to work planning prior to surgery by the employer is seen as a potential facilitator to return to work. **(INTERVIEWS)**
- Organisations with on-site occupational health are seen as having an advantage in supporting employees' return to work following surgery. However there are concerns that occupational health might take an out-dated approach to recovery, might not have an in-depth knowledge of the patient's job, or be risk-averse and extend sick leave unnecessarily. **(INTERVIEWS)**
- Surgery itself can be a barrier to returning to work, including postoperative symptoms of pain, oedema, low mood and fatigue, and restrictions such as hip precautions. **(INTERVIEWS)**
- Patients mainly identify the physical demands of the job, the availability of modifications, and the support of managers and colleagues as influencing factors, whereas employers and clinicians also perceive that the characteristics of the individual patient can help or hinder their return to work. **(INTERVIEWS)**

INVERVENTION: An Occupational Advice Intervention

Perceived need

- There is widespread workplace support for an occupational advice intervention, for use by employees and employers however patients and clinicians perceive that not all patients might need an intervention. **(INTERVIEWS)**
- Currently employers are reliant on employee feedback, and are not necessarily aware of the content of the information patients receive until the employee has returned to work. Having a standardised, approved intervention is seen as potentially beneficial. **(INTERVIEWS)**
- Accurate information about expected recovery might encourage patients to have surgery earlier, and prompt patients to discuss the timing of surgery with their employer, which could benefit their future health and work prospects. **(INTERVIEWS)**

- Healthcare providers do not see providing occupational advice as a priority compared with addressing other patient needs. The intervention might require increased resources, and existing service level agreements might limit the extent of support available from the hospital orthopaedic team. **(INTERVIEWS AND SURVEY)**
- An occupational advice intervention that a) helps those who would have returned to work using standard care get back to work earlier; b) improves rates of full sustained return to work or; c) helps those patients who would not have returned to work using standard care get back to work is desirable as they would produce overall benefits to the patient, employer and society. **(EVIDENCE SYNTHESIS and INTERVIEWS)**
- Any intervention should complement rather than replace existing pre-operative information. Most trusts have invested significant time and resource creating patient resources and the occupational advice intervention should sit alongside these. **(INTERVIEW and SURVEY)**
- Delivering a tailored intervention for individual patients is considered difficult in practice, but potentially of value to the NHS and to employers. **(INTERVIEWS)**

Content and format

- An individualised or personalised approach to the intervention might be required because of the differences in employee characteristics and circumstances. **(INTERVIEWS)**
- Suggestions for the content of the intervention include information about occupational health, complications, restrictions, signposting, advice lines, symptom management and information on expected recovery milestones, as well as advice regarding sick-notes, negotiating modifications, and medication and work. Advice should include the psychosocial impacts of returning to work, such as feelings of isolation, fatigue, loss of identity and confidence, and anxiety. **(INTERVIEWS)**
- Generic components of previously developed return to work interventions include: work simulation, work hardening and job simulation; contact with the employers; physical therapy and exercise; educational content; vocational counselling and guidance; multidisciplinary team involvement. **(EVIDENCE SYNTHESIS)**
- A printed format for information materials is favoured by patients, health practitioners and employers. Many are positive about using digital resources; however computer literacy does not mean that patients would prefer their advice exclusively by this method. **(INTERVIEWS)**
- Employers favour information in a paper format that other stakeholders can access and contribute to at different stages in the process of return to work that would aid clarity and transparency of information. **(INTERVIEWS)**

Delivery and Timing

- Some patients might not be able or willing to process a great deal of written one-way information, and a more personal verbal approach – group and individual, face-to-face and by phone - has advantages in terms of opportunities for asking questions and for seeking clarification and explanation. **(INTERVIEWS)**
- Some GPs suggest using a format similar to that used for new parents (the Red Book) that other stakeholders could use and contribute to. **(INTERVIEWS)**
- Employers are keen to be recipients of the intervention. There is support for designing the intervention in such a way that the employers can see or be provided with information about the operation, and a copy of any generic and individual work-related advice, rather than simply relying only on the patient to report that information. Employers also suggest that the intervention include information for employees as to how they can help themselves at different stages in the surgical pathway. **(INTERVIEWS)**
- There are differing views regarding who should be delivering the intervention and the timing of the intervention. **(INTERVIEWS)**

- Evidence indicates that healthcare-based return to work rehabilitation is best delivered by multi-disciplinary teams using a biopsychosocial approach and a tailored 'stepped care' model. **(EVIDENCE SYNTHESIS)**
- Current NHS resources are seen as a barrier to the advice and support available to those returning to work, because clinicians have less time to spend with individual patients, including post-operative physiotherapy. **(INTERVIEWS)**

COMPARATOR: Advice currently provided to return to work patients

Current delivery of return to work advice

- Patients currently receive a range of written advice and information in a variety of formats from secondary care prior to surgery. However, the advice received does not usually include information about return to work, and tends to focus on the needs of an older retired population. **(INTERVIEWS and SURVEY)**
- The delivery of occupational advice is not generally seen as the role of, or a priority for, the orthopaedic team. There is a perceived dependence on doctors to guide the recovery process and some of this responsibility could be delegated to other healthcare professionals. **(INTERVIEWS and SURVEY)**
- Occupational advice is generally given ad-hoc, verbally, and at patient request. **(SURVEY)**
- Most clinicians have only a superficial understanding of any occupational advice provided to patients through the hospital orthopaedic team. **(INTERVIEWS and SURVEY)**
- Many hospital orthopaedic staff feel unable to provide advice about returning to work and most AHPs take their lead from, or defer, to the surgeon. **(INTERVIEWS and SURVEY)**
- Surgeons feel they lack the necessary knowledge of patients' occupations, and the skills to give more than general advice. **(INTERVIEWS)**
- Surgeons frequently refer to return to work advice in terms of 'blanket' timescales - often six and twelve weeks of sickness absence - which usually coincides with follow-up appointments and advice on returning to drive. These timescales appear mainly to be used for the sake of convenience, with some basis in clinical reasoning and experience. **(INTERVIEWS and SURVEY)**
- Surgeons' advice tends to focus on whether or not someone would eventually return to their job, and how long they might be on sick leave, rather than rehabilitation 'on the job' through adjustments. **(INTERVIEWS)**

Structure of current NHS services

- The structure of existing pre-admission and pre-operative education programmes is extremely varied both in terms of content, timing and the healthcare team members delivering this information. Resources are at a premium therefore any occupational advice intervention should be embeddable within existing pathways without the need for significant service restructure. An occupational advice intervention therefore needs to be pragmatic and deliverable within current healthcare settings **(INTERVIEWS and SURVEY)**
- Most surgeons do not see their patients again after listing for surgery until the day of surgery and then only once after surgery limiting the opportunities to discuss return to work issues. **(INTERVIEWS and SURVEY)**
- Communication with other stakeholders about patients' return to work or other occupational matters is limited. Patients are the main conduit of information and advice for employers, which depends on how the patient interprets and communicates the advice given by the surgeon. Clinic/discharge letters to the GP rarely focuses on work issues. **(INTERVIEWS)**
- GPs see their main role as supporting (and not 'interfering' with) the medical treatment of the patient after surgery. They assume the main responsibility for advising on work rests with the

hospital team and/or physiotherapists, or with occupational health departments. GPs report that their role with patients is restricted by lack of resources, particularly time, and their skillset. Employers perceived that GPs are variable in the support they provided in return to work, and inclined to be overcautious. **(INTERVIEWS)**

- The opportunity for patients to receive advice/information from AHPs and nurses varies between trusts. In some cases separate preoperative group education classes are held for hip and knee patients, in others these are combined. **(INTERVIEWS and SURVEY)**
- Occupational therapy is generally not routinely provided for knee replacement patients, particularly those under 60 years old, because they rarely need adaptive equipment on discharge. **(INTERVIEWS)**
- Post-operative physiotherapy for knee patients however is favoured. Hip patients are unlikely to receive physiotherapy post-operatively as routine, although individual patients might be referred depending on need. **(INTERVIEWS)**

OUTCOME: Measurement of return to work

How is return to work measured?

- There is no standardised method of measuring 'return to work'. **(EVIDENCE SYNTHESIS)**
- A variety of tools have previously been used to assess return to work after surgery or for musculoskeletal conditions. Generally measures used in the literature fall in to one of the following categories: non-standardised return to work/activities measures, standardised scales for return to work/usual activities, measures focusing on musculoskeletal symptoms, quality of life, psychological and other measures. Number of days of sick leave is also commonly used. Patient reported outcome measures tend to focus more broadly on activities of daily living. **(EVIDENCE SYNTHESIS)**
- Other potential measures might include retention/relapse following return to work, sickness absence prior to surgery, work ability/performance, use of analgesia, and whether expectations of surgery/return to work are met. **(INTERVIEWS and SURVEY)**
- As regards measuring the impact of the intervention potential measures included qualitative assessment of the process and the extent to which any intervention was accessed and perceived to be useful. **(INTERVIEWS)**

7.4 Logic Model of the Problem

Having explored the issues relating to return to work for people undergoing hip and knee replacement, based on the information from IM stage 1 the next step was defining the problem to be addressed by an intervention by creating logic models to better understand the problem.

Failing to return to work when fit to do some work, or returning to work too soon which may impede full recovery, potentially increases the risk of patients not achieving sustained return to their usual/expected work following THR/TKR. The theory- and evidence- based factors causally related to these patient behaviours include patients' knowledge and beliefs about the recovery process in relation to return to work; their attitudes to and expectations of return to work; matters related to financial/job security; and their confidence in managing their recovery and RTW.

Following the ecological model (Figure 9), several environmental factors were identified that could either directly or indirectly influence these patient behaviours. For example, these included interpersonal factors such as the influence of friends and family, interpersonal healthcare factors such as the influence and practice of primary care clinicians, organisational healthcare factors such as hospital resources, commissioning decisions, workplace factors such as the availability of modified

work, and societal factors such as NHS policies regarding work and health outcome measurement. As the study had neither the remit nor resources to address all of the factors identified, its main focus was on the interpersonal (healthcare) factor of work-focused advice and support provided by hospital orthopaedic teams. The theory- and evidence- based factors causally related to the behaviour of hospital orthopaedic teams included their knowledge and skills in offering work-focused advice, attitudes and beliefs about roles and resources and patient need.

A logic model of the problem illustrates in detail the problem under investigation and the relationships and factors associated with it (Figure 10).

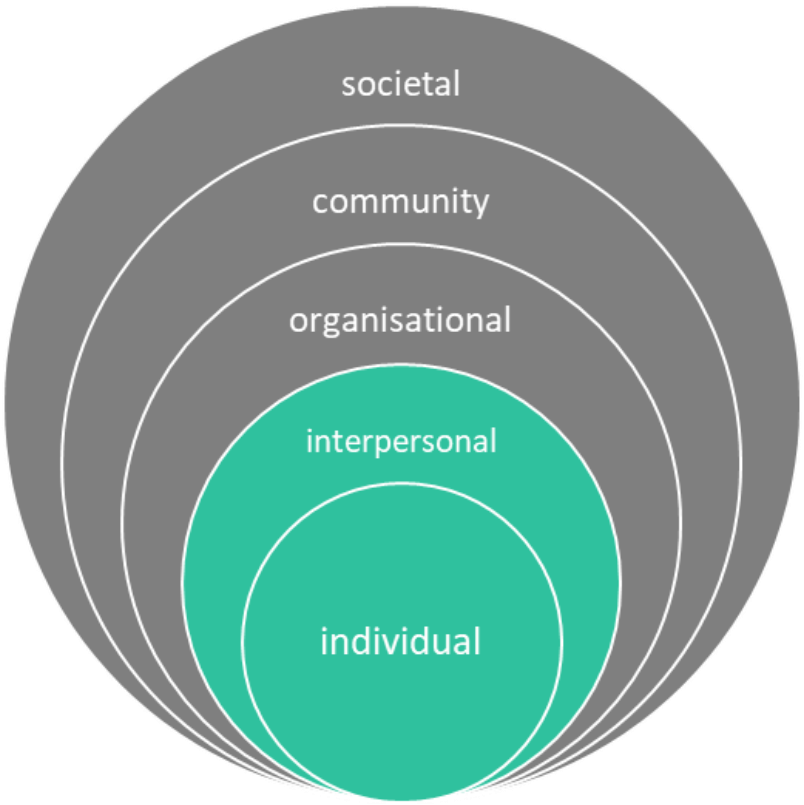

Figure 9: Ecological Model illustrating the outcomes to be addressed by Intervention Mapping in this study (in green)

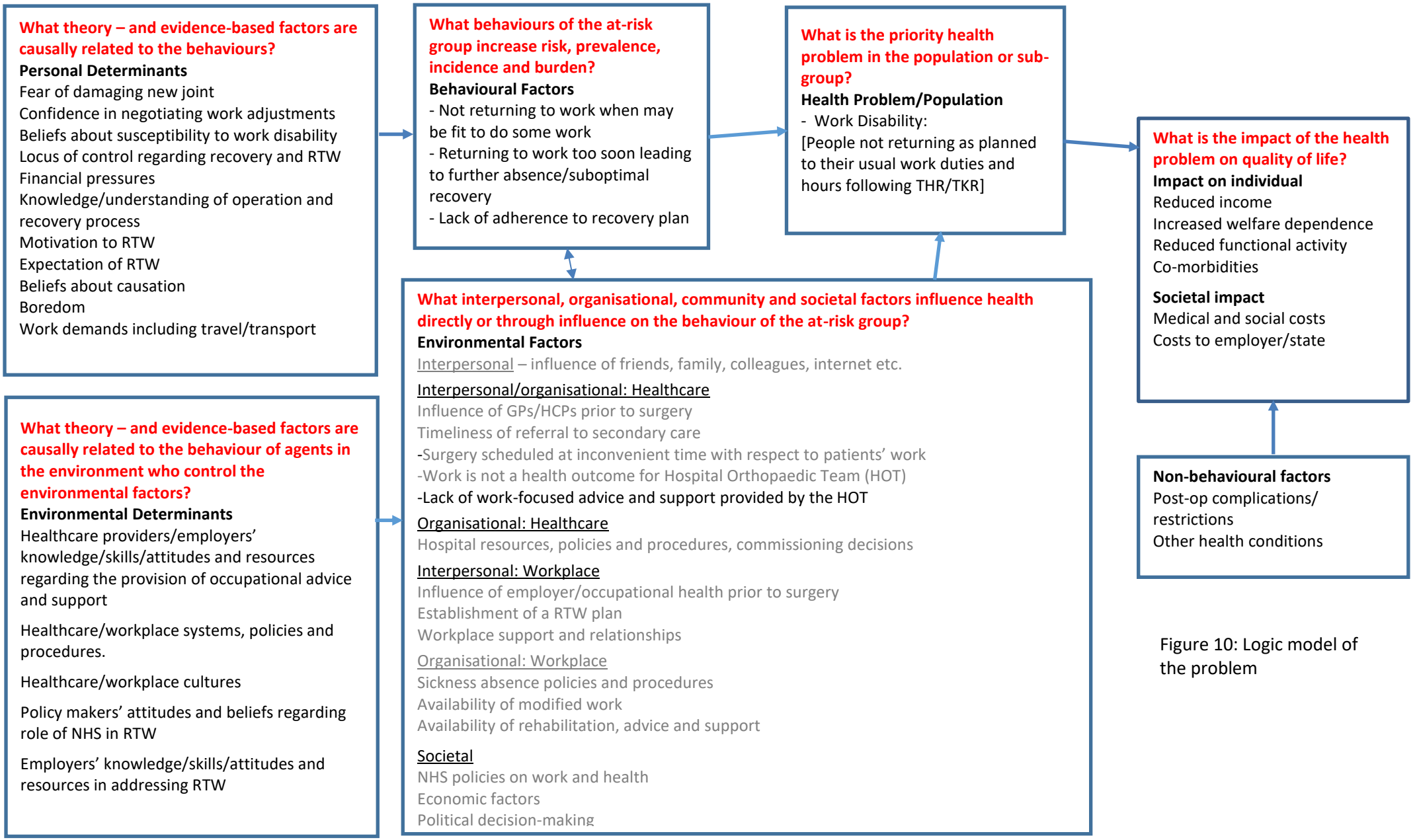

Figure 10: Logic model of the problem

7.5 IM Stage 2

Stage 2 of the IM process involved the following five elements:

The first element of stage 2 of the intervention mapping process involved stating the expected behavioural and environmental outcomes of the intervention. There were two:

1. The patient makes a safe and sustained return to usual work following surgery
2. The hospital orthopaedic team provides work-focused advice and support

The second element of stage 2 was to specify the performance objectives for patients and the members of the hospital orthopaedic team. The needs assessment indicated that patients would benefit from occupational advice as early as possible in the hospital pathway, starting from the clinic appointment with the surgeon. It should also involve employers and continue post-discharge. As well as containing generic information and advice, the intervention should also be individually targeted. A preliminary list of patient performance objectives, and at what stage these might take place, were initially drawn up by CC, FN and MN, then presented to/discussed/revised with PB, before they were circulated to the rest of the OPAL team for comment and further review (Table 9).

In order for patients to change their behaviour, and thus achieve their performance objectives, staff would also be required to change their behaviour. A preliminary list of staff performance objectives and at what stage these might take place were therefore also drawn up by the OPAL investigators (Table 10). Drafting the performance objectives for patients and staff led to a number of unresolved questions (see right hand column of tables 9 and 10). Uncertainty around these questions formed the basis of the initial draft questions put to the Delphi consensus group (*see Chapter 8*) with their responses allowing subsequent revision and refinement of each of the performance objectives as the position around each was clarified.

The third element of stage 2 was to select the determinants for the behavioural outcomes of both patients and hospital staff. Based on the literature, views and experiences of the investigators, and the findings of the needs assessment, the key determinants selected for both patients and hospital staff included:

- Knowledge & awareness
- Skills & self-efficacy
- Attitudes, beliefs, emotions
- Outcome expectations
- Perceived norms

The fourth element of stage 2 was to specify the desired change objectives and to build matrices of change for every behaviour, target group and environmental agent that was required to be influenced. The change objectives were initially generated by CC, FN and MN, then presented to/discussed/revised with PB, before they were circulated to the rest of the OPAL team for comment and further review. Choice of change methods were informed by Intervention Mapping texts[55, 56] and were also reviewed and commented on by Christine Markham in the United States, an international lead and trainer in IM. An example of the patient change objectives required to achieve a performance objective is shown in table 11. A completed matrix for all patient change objectives linked to the final intervention patient performance objectives can be found in *Appendix 6, Section 1*. An example of the staff change objectives required to achieve a performance objective is shown in table 12. A completed matrix for all staff change objectives in the final occupational advice intervention can be found in *Appendix 6, Section 1.*

The fifth and final element of stage 2 was to create a Logic Model of Change to illustrate the proposed causal relations between theory- and evidence-based change methods, the determinants they are expected to influence, and behavioural and environmental outcomes that will address the health problem (figure 11).

Table 9: Preliminary list of patient performance objectives

Patient Performance Objectives		Stage in pathway	Examples of unresolved questions?
1.	Patient makes informed decision about surgery with respect to work	At/following first clinic appt	How will this be done? Whose responsibility is it to enable this? What is the role of the GP / Surgeon?
2.	Patient is provided with advice and information about recovery and RTW	Following first clinic appt/listing	What information is important? How and when will the information be delivered?
3.	Patient provides employer with accurate information about their planned surgery and recovery	Prior to surgery	What information will the employers receive? How will this be delivered to employers?
4.	Patient completes RTW checklist detailing their work demands (with employer as required)	Prior to surgery	What information will be included in the checklist? When will it be completed?
5.	Patient identifies and prioritises potential barriers and solutions to a safe and appropriate RTW	Prior to surgery	How will patients do this? Will they do this with their employer? What skills to we need to equip them with to allow this to happen?
6.	Patient engages with hospital team allowing pre-operative development of a RTW plan	Prior to surgery	Which member of the hospital orthopaedic team and when will this happen? What training will be involved?
7.	Patient meets with their employer to discuss their recovery and provisional RTW plan	Prior to surgery	How long before surgery will this happen? Will it happen after the employer has received the information in PO3?
8.	'At risk' patient engages in a minimum of three pre-operative follow-ups (phone calls/meet ups) with member of hospital staff to help develop a RTW plan and enable safe RTW	Prior to surgery	How do we identify 'at risk' patients? Is it feasible to offer 3 pre-operative appointments? What are the resource implications? Will patients be able to attend if they are continuing to work?
9.	Patient communicates with employer regarding surgical outcome and progress/recovery	Following surgery	How soon after surgery should they do this? How will the patient / employer get information about the post-operative recovery?
10.	Patient revises RTW plan following surgery as necessary with their employer and hospital staff	Following surgery	How will this happen (especially is patient not routinely followed up / offered post-operative therapy)?
11.	'At risk' patient engages in a minimum of three post-operative follow-ups (phone calls/meet ups) with member of hospital staff to Review progress with RTW plan	Following surgery	How do we identify 'at risk patients'? Is it feasible to offer 3 pre-operative appointments? What are the resource implications?
12.	Patient adheres to postoperative rehabilitation plan and advice	Following surgery	Can we monitor this? How do we ensure it happens?
13.	Patient seeks help and support regarding RTW as required postoperatively	Following surgery	How do we facilitate this? What is the mechanism for support?

Table 10: Preliminary list of staff performance objectives

Staff performance objectives		Stage in pathway	Examples of unresolved questions?
1	Staff screen patients that intend to RTW prior to meeting with surgeon	At first clinic appt/listing	How will this be done? Which team member will be responsible?
2	Surgeon asks patients about their usual work and expectations of RTW following surgery	At first clinic appt/listing	How do we ensure this is done? What tools can we develop to enable this process?
3	Surgeon discusses pros and cons of surgery with patient including timescales of surgery - in relation to patients' usual work	At first clinic appt/listing	Need to train and empower surgeons - how do we get them to engage?
4	Surgeon considers patients' work schedules when listing them for surgery	At listing	How do they get this information and is this possible?
5	Staff screen patients to identify those who are perceived to be at risk of not making a safe and appropriate/expected RTW	At listing	How do we identify 'at risk' patients and what tools could assist with this?
6	Staff provide all patients with RTW advice manual and contact phone/email	At listing	What will the patient manual include?
7	Staff provide patients with generic written information relating to surgery/RTW to give to their employer/colleagues	At listing	What will the employer manual include?
8	Staff provide 'at risk' patients with RTW checklist to complete with their employer if necessary (i.e. if patient unable to answer questions about availability of modified work)	At listing	How do we identify 'at risk' patients and what tools could assist with this? What would the checklist include?
9	Staff make a minimum of three pre-operative follow-ups (phone calls/meet ups) with patients in 'at risk' group to: Review occupational checklist Identify potential barriers and solutions to safe and appropriate RTW Develop a RTW plan Liaise with employer as appropriate	Pre-op	Is this possible? What are the resource implications of 3 pre-operative interactions? Will patients have time for this and be willing to engage with it?
10	Staff routinely include the topic of RTW in group pre-op education and identify any 'at risk' patients to… (as per PO9)	Pre-op	How do we signpost RTW patients to the pre-op education team? What information do they need to cover?
11	Staff routinely ask patients at pre-assessment about RTW and identify any 'at risk' patients to… (as per PO9)	Pre-op	How do we signpost RTW patients to the pre-assessment teams? What information do they need to cover?
12	Surgeon liaises with treatment team regarding patient's post-op recovery and how this may impact on patient's RTW	Post-op prior to discharge	Will surgeons take an active interest?
13	Staff complete a post-operative screening tool to identify 'at risk' patients	Post-op prior to discharge	When will this be done and who will do it? How do we identify 'at risk' patients and what tools could assist with this?
14	Staff advise on revision of the patient's RTW plan as necessary following surgery	Post-op	Which staff and when will this happen?
15	Staff summarise patient's expected RTW outcome and RTW plan in ward	Post-op	How will junior doctors on the ward find this information? What

	discharge letter		specific information will be sent to the GP?
16	Staff give a copy of the ward discharge letter to the patient addressed to their employer to pass on if they wish to	Post-op	Who will do this? Will patients be happy to share this information with their employers
17	Staff ask each patient whether they require a fit note on discharge	Post-op prior to discharge	
18	Staff complete fit notes in accordance with best practice guidelines and hospital standard contract	Post-op prior to discharge	How do we determine the duration of the fit note and what recommendations for work are included?
19	Staff offer all RTW patients a minimum of three post-op physiotherapy/rehabilitation appointments	Post-op	Is this feasible? (not routine care for all)
20	Staff offer all 'at risk' patients a minimum of six post-op physiotherapy/rehabilitation appointments	Post-op	Is this feasible? (not routine care for all), How do we identify 'at risk' patients for this more intensive approach
21	Staff conduct a minimum of three follow-up phone calls/meet ups with 'at risk' patients to review progress with RTW plan, support/signpost, liaise with employer as required	Post-op	Is this feasible? (not routine care for all), how much staff time will be required? Are the resources available for this?
22	Staff summarise and record patient's RTW status/outcome in all out-patient clinic notes and following each appointment with therapists	Follow-up	When will they do this and where will they record the information so that it is visible?
23	Staff discharge patient from the orthopaedic service when the patient has RTW	Discharge	Some people may not return to work so this implies they will remain under orthopaedics – for how long should orthopaedic teams offer follow up for RTW issues?

Table 11: Example of patient change objective

	Determinants				
Performance Objective	Knowledge & awareness	Skills & self-efficacy	Attitudes, beliefs, emotions	Outcome expectations	Perceived norms
Patient makes informed decision about surgery with respect to their work	Appraises the general risks/benefits of surgery and RTW rates. Appraises the likely impact of surgery on their ability to do their job. States that they have received sufficient information about surgery.	Expresses confidence in ability to make informed decision about surgery. Demonstrates ability to process information about surgical procedure and make informed choice.	Expresses willingness to take responsibility for surgical decision. Demonstrates appropriate response with regard to their decision.	Describes a realistic expectation of outcome following surgery.	Perceives it is usual for patients to make an informed decision about surgery with respect to work. Recognises that nowadays patients are encouraged to take an active part in their care. Recognises that RTW is now considered a health outcome.

Table 12: Example of staff change objective

	Determinants				
Performance Objective	Knowledge & awareness	Skills & self-efficacy	Attitudes, beliefs, emotions	Outcome expectations	Perceived norms
Staff screen patients that intend to RTW to prior to meeting with surgeon using occupational checklist	Team members describe process of asking RTW patients to complete checklist and giving it to surgeon.	Team members express confidence in ability to ask RTW patients to complete checklist and giving it to surgeon	Team members state that asking RTW patients to complete occupational checklist will help patient and surgeon make more informed decision about surgery with regard to RTW	Team members recognise that preparing the patient and surgeon to discuss the patient's RTW will aid their RTW	Team members perceived that preparing the patient and surgeon to discuss the patient's RTW is usual practice

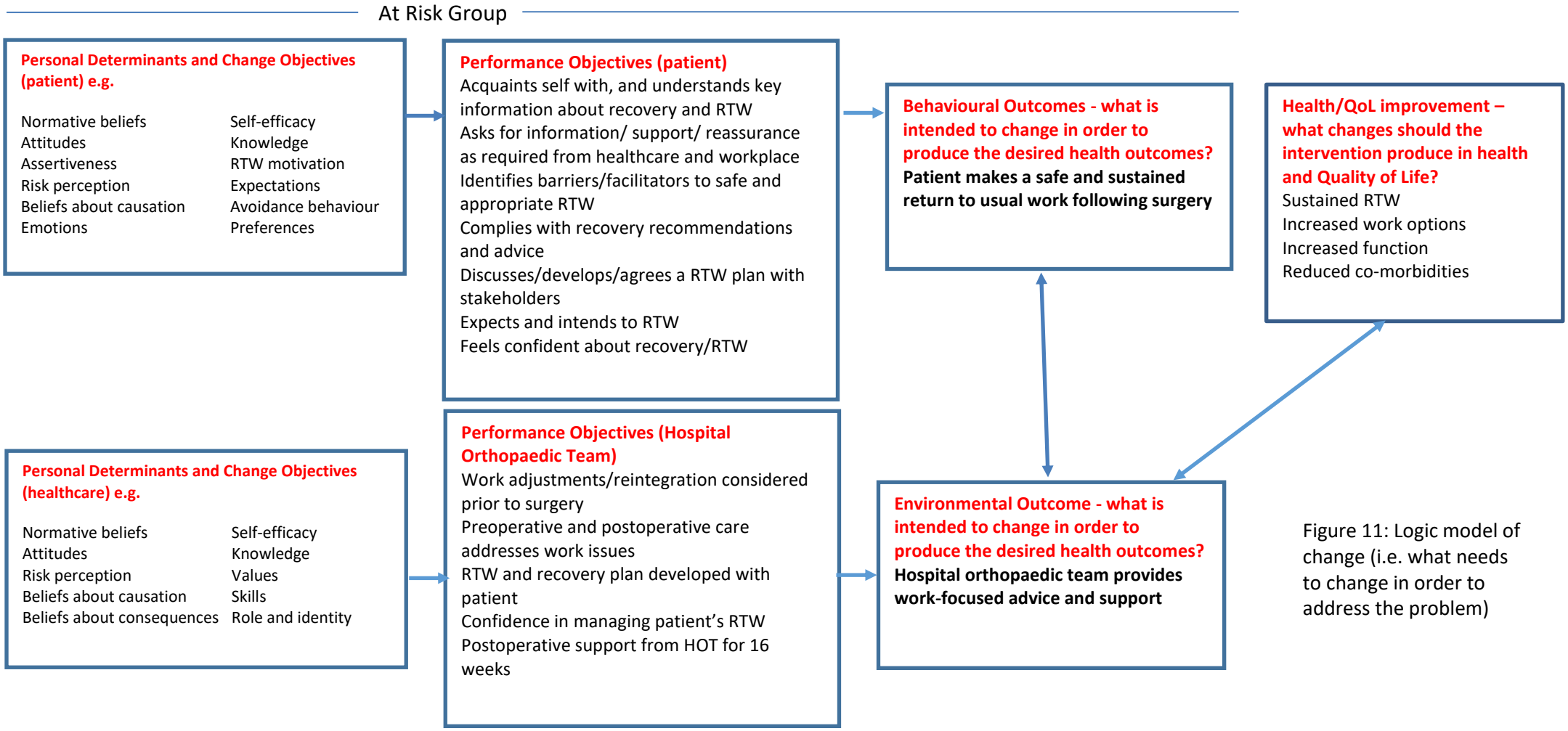

Figure 11: Logic model of change (i.e. what needs to change in order to address the problem)

7.6 IM Stage 3

Stage 3 involved consolidation of ideas about the components, scope and sequence of the intervention. Change objectives organised by determinants in the matrices were reviewed (*see Appendix 6, Section 2*). Theory- and evidence-based methods to influence the determinants in the desired direction were then identified. The parameters for each method were considered and the methods translated into practical applications that matched the target group (patients). An example is shown in Table 13. A table showing the complete methods and applications for the patient group can be seen in *Appendix 6, Section 2.*

Table 13: An example of parameters, methods and practical applications for a patient determinant

Determinant: Knowledge and awareness				
Change objective	**Methods**	**Definition**	**Parameters**	**Application**
5. Patient identifies and prioritises potential barriers and solutions to a safe and appropriate RTW	Modelling (Social Cognitive Theory) Variety of media/Elaboration (Theory of Information Processing)	Providing an appropriate model Stimulating the learner to add meaning to the information that is processed	Identification with the model - receives positive reinforcement, coping vs. mastery model Messages that are personally relevant	Examples of other patients' barriers and solutions and RTW plans included in workbook/on website and at preoperative presentations given by staff Discussions with return to work co-ordinator and preoperative education and assessment team

The parameters for each method were considered and the methods translated into practical applications that matched the target group (staff). An example is shown in Table 14. A table showing the complete methods and applications for the staff group and can be seen in *Appendix 6, Section 3*.

Table 14: An example of parameters, methods and practical applications for a staff determinant

Determinant: Knowledge and awareness				
Change objective	**Methods**	**Definition**	**Parameters**	**Application**
2. Members of the outpatient clinic team know the process of identifying RTW patients before their appointment with surgeon: • how • when • where	Discussion (Elaboration Likelihood Model) Providing Cues (Theories of Information Processing) Individualisation /tailoring (Trans-Theoretical Model)	Encouraging consideration of topic in open formal debate. Assuring that the same cues are present at the time of learning and time of retrieval. Matching to participant characteristics	Listening to learner to ensure correct schemas are activated. Work best when people select and provide own cues. Tailoring to participant, relevant to learner's needs	Each member of team has own study pack containing this information. Study pack uses chunking, advance organisers and imagery methods to aid learning Staff to suggest cues to action, e.g. posters/photos on ward/in clinic Tailored staff training

The methods, parameters and applications for both staff and patients were initially generated by CC, FN and MN, then presented to/discussed/revised with PB, before they were circulated to the rest of the OPAL team for comment and review. Choice of methods and parameters were informed by Intervention Mapping texts[55, 56], and were also reviewed and commented on by Christine Markham.

Chapter 8: Intervention Mapping stage 4: Development of components and materials for the occupational advice intervention using a modified Delphi consensus process

8.1 Introduction

IM Stage 4 used a multi-stakeholder intervention development group to help address the areas of uncertainty around the preliminary patient and staff performance objectives and potential intervention components identified in *Chapter 7*. Their remit was to help reach agreement about the content, delivery, format and timing of the proposed occupational advice intervention. A modified Delphi consensus process was used to facilitate this process.

8.2 Objectives

The Delphi consensus process supported study objectives 7 and 8 (*see section 1.5, page 25*).

8.3 Methods

During IM stage 1-3 potential performance objectives and intervention components emerged within the IM development framework. However, there was considerable uncertainty related to these objectives as described in tables 9 and 10. These areas of uncertainty were used to create statements relating to the intervention that were explored using a modified Delphi consensus process. The Delphi process generated information about the level of agreement relating to these statements that was subsequently used to refine the intervention.

Stakeholder recruitment

Five stakeholder groups were identified for inclusion in the modified Delphi process mirroring the groups involved in IM Phase 1. The sampling strategy for each stakeholder group is outlined in table 1 (*see Chapter 2*), with participants chosen to maximise patient, public and professional engagement. Participants were nationally sampled from across England and Scotland (*see Appendix 7, Table 69*). To ensure the validity of the consensus process a minimum of 5 individuals from each stakeholder group were recruited. A maximum limit of 15 individuals from any given stakeholder group was chosen to ensure one group's opinions did not overwhelm the opinions of others within the consensus process. In total 66 participants were invited to participate in Round 1 of the Delphi process (*see Appendix 7, Section 1*).

Statement development

Statements relating to the proposed **content, format, delivery, timing and measurement** of the occupational advice intervention were developed within the OPAL investigator group. Due to the breadth of statements and their inter-related nature, a step-wise approach to the presentation of individual statements to the Delphi group was adopted.

Round 1 focussed on defining the **content** of the intervention in 2 sections. Section 1, focussed on the content ('written' advice and information) and section 2 on activities to deliver content (actions or processes for patients, employers and healthcare members to undertake). These statements were piloted by two surgeons, two GPs and three patients prior to distribution to the Delphi panel.

The information from Round 1 was then used to refine the statements for Round 2, which focussed on defining the **format, delivery, timing and measurement** of the content examined in Round 1. The statements for Round 2 were grouped under headings in order to enable the Delphi panel to explore different approaches to these specific areas. Round 3 was then used to clarify any areas of residual uncertainty from Rounds 1 and 2 and present the draft occupational advice intervention back to the Delphi participants for comment.

Definition of agreement
Participants were asked to rate individual statements in the Delphi questionnaire with possible options being: Strongly agree; Agree; Disagree; Strongly Disagree; Don't know. Participants were asked to rate the **importance** of the content or action given in the statement. For a subset of statements in Round 1 they were also asked to rate the **deliverability** of the content or action alongside current healthcare provision. This was done to assess whether the stakeholders felt certain actions, despite being important, were achievable due to their experience of current service delivery, funding and logistics. Therefore for this subset of statements the participants were asked to provide two ratings one for 'importance' and one for 'deliverability'.

At the end of each section participants were also able to insert comments in a free text box or provide additional suggestions relating to the intervention that could be evaluated in subsequent rounds. In rounds in which statements from a previous Delphi round were being re-presented, these were presented alongside controlled feedback with modal round one rating for these statements; the proportion of each response option selected by the other participants; and a reminder of the participant's own previous ratings.

Delivery of the Delphi survey
The Delphi survey was delivered via email using an online web-based survey platform (Surveymonkey). Round 1 was delivered between 25 September 2017 and 13 October 2017, Round 2 between 22 November 2017 and 13 December 2017 and Round 3 between 01 June 2018 and 22 June 2018. See OPAL Delphi questionnaires. The survey included a covering email to the participants and an electronic link to the questionnaires. This email informed the participants of the details of each round and provided instructions on completing the survey. Round 1 and 2 questionnaires required respondents to provide their initials and occupation to assist the investigators in identifying respondents. Round 3 emails included 4 documents from the developed occupational advice intervention (A summary of the intervention, Occupational Checklist, Patient 'return to work' workbook and Employer booklet) for participants to review and comment. A minimum of two reminders were sent to non-responders during the final week of the surveys.

Analysis of data
An *a priori* consensus level of 70% (Strongly agree/Agree or Strongly disagree/Disagree) across all stakeholder groups combined was set[139]. For statements that failed to reach consensus across the overall group further analysis was undertaken based on responses for each of the 5 stakeholder subgroups. The following rules were then employed to determine which statements were discarded and which were re-presented in the next round.

- If no or only one stakeholder group reached concordant consensus ($\geq$70% agreement or disagreement) then the statement was withdrawn
- If 2 or more stakeholder groups reached concordant consensus ($\geq$70% agreement or disagreement) then the statement was re-presented in the next round
- In the situation where 1 or more stakeholder groups reached 'agreement' and another group reached 'disagreement' the statement was discussed within the investigators and a decision on inclusion/exclusion of the statement made.

As stated previously a subgroup of Round 1 statements were rated for their deliverability in addition to their perceived importance. For these statements consensus was reached if the 70% threshold was achieved for both the importance and deliverability rating. Statements that reached consensus for one of the domains were analysed by stakeholder grouping as described above.

In Round 1 statements relating to the **content** of the intervention were ranked according to the level of agreement to enable the investigators to determine which items of content were the most important to include within the intervention.

In Round 3 the intervention documents created based on the results of the first two rounds were presented and descriptive open feedback from participants recorded.

8.4 Results

The OPAL Delphi consensus process is summarised in Figure 12.

Round 1:
Responses were received from 43 of the 66 invited participants (65%) including 14 patients, 8 surgeons, 6 GPs, 11 allied health professionals and nurses, and 4 employers. In section 1 ('written' advice and information), consensus was reached for 26 of 32 statements (81%). Of the remaining 6 statements 5 reached consensus for 2 or more stakeholder groups and were therefore taken forward to Round 2 and 1 statement was discarded. A full summary of all Round 1 section 1 responses and analysis are reported in *Appendix 7, Section 2*. The top 10 'Section 1' statements reaching consensus, ranked based on the level of agreement (% that responded strongly agree or agree), are listed below.

Question: Is it important that an occupational advice intervention commenced prior to hip or knee replacement includes the following (% Strongly agree or Agree)

1. Information about exercises and rehabilitation following surgery (100%)
2. Information about returning to driving (100%)
3. A broad overview written for all stakeholders, of what to expect following surgery (rates and timing of expected recovery) (98%)
4. Information about managing pain, types of analgesia and side effect (98%)
5. Information about post-operative precautions, restrictions and activities to avoid following surgery (95%)
6. Information about symptom management in relation to return to work and specific occupations e.g. expected levels of fatigue, pain, swelling (95%)
7. Tips and tricks to help the patient manage around their home with day to day activities immediately following surgery (95%)
8. Information regarding post-operative complications and their management (95%)
9. Signposting to DVLA guidance (95%)
10. Information for the patient about who to ask if they are having a problem returning to work (93%)

In section 2 (actions or processes for patients, employers and healthcare members to undertake) participants were asked to rate both the **importance** and **deliverability** of each statement. Of the 32 components presented 10 (31%) reached consensus for both importance and deliverability. Of the remaining 22 statements, 14 reached consensus for importance but not deliverability, 2 reached consensus for deliverability but not importance and 6 did not reach consensus for either. Of these statements 7 reached consensus for both importance and deliverability for 2 or more stakeholder groups and were therefore taken forward to Round 2 and 15 statements were discarded. A full summary of all Round 1 section 2 responses and analysis are reported in *Appendix 7, Section 2*. The top 10 'Section 2' statements reaching consensus, ranked based on the level of agreement (% that responded very important or important), are listed below.

How important/deliverable do you believe the following components are if an occupational advice intervention commencing prior to hip or knee replacement were to be developed (% Strongly agree or Agree with the importance and deliverability of the statement)?

1. A post-operative mechanism for the identification of patients that are not progressing toward return to work as planned (Important 95%, Deliverable 71%)
2. Guidance for health services defining 'best practice' for patients returning to work after hip and knee replacement surgery (Important 93%, Deliverable 82%)
3. Training for members of the hospital orthopaedic care team to increase awareness about return to work issues (Important 88%, Deliverable 82%)
4. Interaction between the healthcare team and patient by phone, email or 'on-line' so that members of the care team can monitor progress and help the patient use the advice and information provided (Important 88%, Deliverable 70%)
5. Guidance on when in the return to work process patients can safely be discharged back to primary care for continued management of their return to work (Important 86%, Deliverable 80%)
6. A mechanism for pre-operative identification of patients at 'high risk' of prolonged sickness absence following surgery (Important 86%, Deliverable 74%)
7. Routine pre-operative therapy assessment during which a return to work plan is developed between the patients and the hospital orthopaedic care team (Important 84%, Deliverable 80%)
8. A separate intervention for hip and knee replacement patients that are not progressing towards return to work as planned (Important 84%, Deliverable 79%)
9. A process by which work status can be included in referral information for all patients referred from primary care into secondary care for consideration of hip or knee replacement (Important 79%, Deliverable 79%)
10. Information from patients that have experienced the process of returning to work after hip or knee replacement within the pre-operative education process (Important 76%, Deliverable 73%)

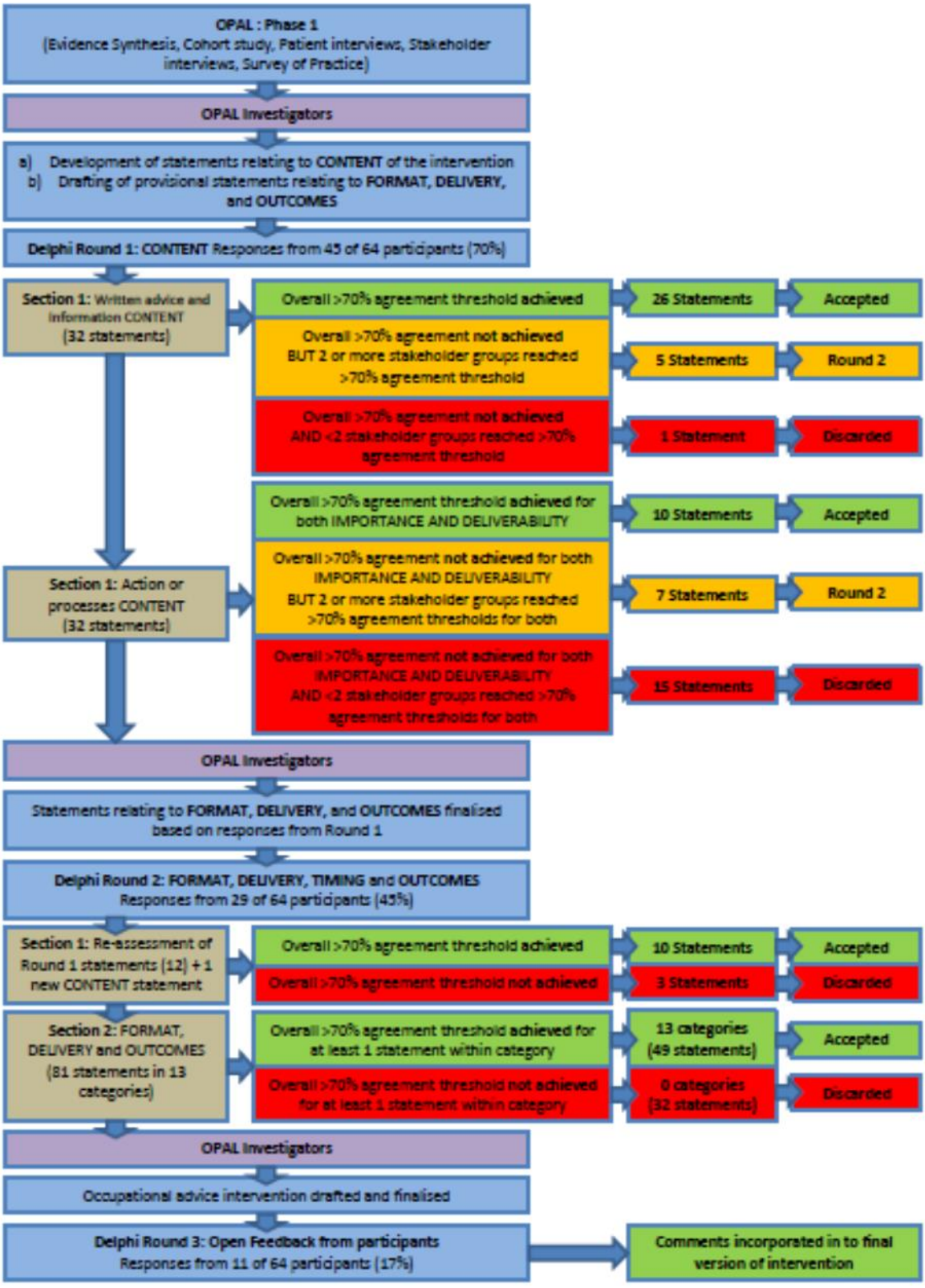

Figure 12: Summary of Delphi consensus process

Round 2:
Responses were received from 26 of the 66 participants (39%) including 8 patients, 7 surgeons, 3 GPs, 6 allied health professionals and nurses, and 2 employers.

The twelve questions (5 from section 1 and 7 from section 2) carried forward from Round 1 plus one additional question generated from the free text comments (*see Appendix 7, Section 2*) were presented to participants. In round 2 participants were only asked to rate the **importance** of these statements, having been made aware of the responses from Round 1 and the overall group's position regarding the deliverability of the component if applicable. Of the thirteen statements 10 reached the threshold for consensus (*see Appendix 7, Section 3*).

Based on the responses to Round 1 a further 81 statements grouped into 13 categories were generated. These statements related to the **format, delivery, timing and measurement** of the agreed content components from Round 1. Each category included 3 to 9 statements relating to a common category theme (*see OPAL Survey questionnaires*). This allowed the participants to compare different options presented within the category in the context of the other available options and reach a position on each statement accordingly. This allowed the investigators to explore different approaches to a given problem. For example the first category asked participants to rate a set of 5 statements relating to which healthcare team member should have responsibility for delivery and co-ordination of the occupational advice intervention. If at least one or more statements in a given category reached consensus this was taken as representative of the Delphi group's position relating to the given category and the remaining statements were discarded.

Overall 49 statements (60%) reached consensus (44 agreement and 5 disagreement). At least one statement in every category reached consensus (*see Appendix 7, Section 3*).

The 13 categories presented to participants and a summary of the responses are listed below:

1. **Responsibility for delivery and co-ordination of the return to work intervention**
   Participants agreed the orthopaedic surgeons should not be responsible for delivering and co-ordinating the return to work intervention (88% agreement). Both surgeons and patients agreed (both >70% agreement) that the intervention should be co-ordinated by primary care teams. However, GPs felt that the intervention should be co-ordinated in secondary care by a nominated member of the orthopaedic team (100% agreement).
2. **Pre-operative identification of patients at 'higher risk' of prolonged sickness absence following surgery that may require additional individualised help and support**
   There was agreement (80%) for a face-to-face assessment with a staff member trained in the return to work intervention to help identify patients at 'higher risk' of prolonged sickness absence following surgery. No agreement was reached on other forms of assessment including written, phone, patient's self-referral and surgeon assessment.
3. **Pre-operative assessment**
   Participants felt a greater level of involvement from the therapy team would be beneficial irrespective of whether the patient was deemed to be 'high risk' of an extended period of sickness absence after surgery (80 to 88% agreement). They also felt development of a return to work plan prior to surgery (80% agreement), discussion with employer (100% agreement) and routine inclusion of return to work information in pre-assessment/education classes (88% agreement) were important.
4. **Post-operative identification of patients at risk of an extended period off work after surgery**
   There was overall agreement for additional monitoring for return to work patients after surgery including routine physiotherapy (84% agreement), closer contact with the therapy team (92%

agreement) and access to phone support (92% agreement). They also felt patients should meet with their employer after surgery to discuss their recovery and plan for return to work (72% agreement).

5. **Additional care for Patients identified as 'higher risk' of an extended period off work after surgery**
   Participants agreed that 'high risk' patients should receive additional physiotherapy (92% agreement) and occupational therapy (76% agreement) input and that this should continue until return to work had been achieved (76% agreement). This could be supplemented by additional information (92% agreement) and referral to the Fit4Work service (84% agreement).
6. **Scope of training for staff**
   The group felt that all members of the hospital orthopaedic team involved in the treatment of hip and knee replacement patients should receive training regarding the intervention (76% agreement) and that training should also be offered to local GP groups (72% agreement).
7. **Communicating occupational status and progress between stakeholders**
   There was widespread agreement for statements relating to improved communication between stakeholders through greater information in referral, clinic, discharge and therapy service letters (84 to 96% agreement). Participants agreed that greater information sharing between primary and secondary care and employers would be beneficial (84 to 96% agreement). However, there was also a feeling that it was the patients and not the healthcare team's responsibility to communicate with their employer about their return to work (76% agreement).
8. **Fit Notes**
   Every patient should be offered a fit note (96% agreement) and it should be completed in accordance with Department for Work and Pensions Fit Note Guidance (96% agreement). Participants felt that providing short length fit notes (2 weeks) to discourage extended periods off work was wrong (72% agreement) but that GPs should be responsible for administering subsequent fit notes after the initial fit note given on discharge (76% agreement).
9. **Format and delivery of patient information**
   Written materials were favoured (76% agreement), although participants felt only the most 'important' information (based on Round 1 ranking) needed to be included with additional information made available from other sources e.g. website (80% agreement). It was felt that an interactive booklet in which information and progress could be recorded and shared (80% agreement) and interactions with their employer documented (92% agreement) would be beneficial. On line materials should be accessible by GPs prior to referral (88% agreement).
10. **When should the intervention commence?**
    There was uncertainty about the timing of the intervention. AHPs and GPs felt it should start during the pre-assessment process. Overall there was agreement that it should not start after surgery (88% agreement).
11. **Defining return to work**
    Participants struggled to agree on a definition of return to work. However, they agreed (72%) that return to work should not be defined as the patient returning to the same job (usual hours and duties) and activities outside of work they were doing prior to surgery.
12. **The aim of the intervention**
    There was agreement that the return to work interventions primary aim should be to return the patient to their pre-operative work role and level of occupational performance (76% agreement).
13. **Measuring return to work**
    There were a number of ideas about how return to work could be measured. The group felt that return to work was not a binary outcome (72% agreement). There was agreement for more detailed assessment including the use of graded assessment based on specific work milestones for example return to place of work, return to normal hours, return to normal workplace

activities (92% agreement) or the resumption of specific work related activities (e.g. climbing, lifting, manual tasks) based on a list of pre-operative workplace activities (72% agreement). Rate of further sick leave (80% agreement), requirement and duration of occupational adjustments (84% agreement) and patient's reports of their experiences and expectations were also felt to be important.

Following round 2 the investigator group convened to further refine the intervention and develop supporting materials and resources (discussed further in *Chapter 9*). During this process a number of materials were drafted which were subsequently shared with the Delphi participants in Round 3.

Round 3:
In Round 3 the finalised occupational advice intervention along with selected patient and staff materials were circulated to 65 of the 66 Delphi participants for comment (1 participant had withdrawn). Responses were received from 11 participants (4 surgeons, 1 physiotherapist, 1 GP, 3 employers, 2 patients) comprising a constructive appraisal of the intervention from 9 respondents (2 employers responded but did not comment on the intervention) as well as highlighting typographical and formatting issues. The feedback was positive in all cases and all of the comments received are reported in *Appendix 7, Section 4.*

Chapter 9: Intervention Mapping stage 4: Development of a draft occupational advice intervention

9.1 Introduction

The Delphi consensus process clarified the stakeholder position with respect to a number of the areas of uncertainty within the initial draft intervention. This information was used to finalise the intervention and create materials to support its delivery. The process of final intervention development ran alongside Delphi Rounds 1 and 2 and prior to Delphi Round 3.

9.2 Objectives

Intervention mapping stage 4 supported study objective 8 (*see section 1.5, page 25*).

9.3 Using information from the Delphi consensus process to refine the intervention

The Delphi process provided the OPAL investigators with additional information about what the occupational advice intervention should include (**content**) and how and when it should happen (**format, delivery and timing**).

Content, format and delivery
The majority of the written information presented to the Delphi group reached consensus either in Round 1 (26 or 32 statements) or when re-presented in Round 2 (3 of 5 statements). During the interviews (*see Chapters 5 and 6*) both patients and employers had stated a preference for written materials, although there was a concern about patients becoming disengaged if the volume of information was overwhelmingly large. The Delphi process suggested only the most 'important' information (based on Delphi ranking) needed to be included in any written materials and that information could be made available in other formats e.g. website.

There was support both from the interviews and through the Delphi process for an interactive booklet in which information and progress could be recorded and shared with other stakeholders invested in the return to work process. The OPAL investigators thought that this approach had the potential to allow patients to record individualised information about their workplace, the impact of their health condition, plans for returning to work and progress after surgery, providing an individualised intervention. This individualised approach also had the potential to avoid having a separate intervention for hip and knee replacement patients as long as patients who did not make the anticipated progress receive individualised 'joint specific' support after surgery. On this basis the OPAL investigators created an interactive patient workbook that enabled the patient to develop a return to work plan, tailored to their own circumstances that could be shared and agreed with their employer. The decision was made to provide key information in the booklet with additional information available via a website that was signposted within the booklet.

There was greater uncertainty about the 'active' elements of the intervention. Two key areas that stakeholders felt were important were 1) the provision of additional pre and post-operative therapy (over and above standard care) in which return to work issues could be addressed and 2) the identification of 'high risk' patients with additional support made available for this group. The initial draft intervention (*see Chapter 7*) mirrored this position and aimed to provide 3 pre-operative and 3 post-operative interactions between the patient and hospital team to discuss return to work, with additional input for 'high risk' patients. However, the investigators identified difficulties with this approach.

Firstly, our cohort data (*see Chapter 4*) failed to identify a 'high risk' population and the current literature describing predictors of return to work after hip and knee replacement (*see Chapter 1*) was limited[42, 44, 48, 136]. This meant we were not able to confidently identify a 'high risk' group in need of a more intensive intervention. The OPAL investigators therefore decided not to pursue a tiered high/low risk intervention and instead focussed on developing an intervention that could be tailored to the patients' needs with the ability to offer more or less support as required.

Secondly, there was concern about the cost, time and logistics associated with the implementation of a resource intensive intervention requiring an additional 6 patient interactions. The survey of practice (*see Chapter 4*) and interviews (*see Chapters 5 and 6*) demonstrated that services varied significantly in their structure and the resources available and concerns were expressed about the implementation and sustainability of an intervention requiring significant additional resources. As such, a flexible model that allows the intervention to be delivered at different times by different people in different trusts dependent upon the timing and delivery of current standard care in individual trusts was considered desirable. Despite the need to limit resource use the investigators felt it was important to have a hospital team member actively engaging with return to work patients. This reflected a key aspect of return to work interventions reported in the rapid evidence review (*see Chapter 3*) in which there was an element of counselling and guidance and the ability to co-ordinate the wider multidisciplinary team. We therefore developed a return to work co-ordinator role which had a range of responsibilities including co-ordination of the return to work process, encouragement and supporting completion of the interactive patient workbook, being a point of access for problems and signposting and assisting with referrals to other existing services should this be required (section 9.5).

The process to identify and support patients having problems and not making progress as expected was then considered. The Delphi group agreed a post-operative mechanism for the identification of patients that were not progressing toward return to work as planned was required. They felt that the intervention should include the ability for the healthcare team to interact with the patient by phone, email or 'on-line' to help monitor progress. These actions were linked to the return to work co-ordinator role though the requirement for the co-ordinator to contact patients prior to surgery to support and monitor their return to work process and be available after surgery via a dedicated return to work contact line (phone or email). This provided patients with access to a designated point of contact that could offer additional help and support if needed. This, in effect, was an extended version of 'usual care' in which problems after surgery are assessed by their clinical team and treated accordingly e.g. group physiotherapy, one-to-one physiotherapy, referral to occupational therapy, referral to occupational health services etc. However, for the purpose of the intervention this task was centralised and administered by the return to work co-ordinator.

Issues relating to fit notes and communication between stakeholders were more easily accommodated within the intervention through the development of specific guidance and examples of correct completion (Section 9.6). While there was agreement that recording work status in referral information from primary care would be beneficial the OPAL investigators felt this was not logistically possible within the study timeframe due to the large number of GP practices referring in to secondary care teams.

Finally, throughout the needs assessment and Delphi process there was a lack of clarity about who should be responsible for administering the intervention. The prevailing opinion was 'anyone but me'. Therefore, as work-focused healthcare is a relatively new concept and delivery of occupational advice not perceived to be the role of any particular health professional, the OPAL investigators agreed that all members of staff should be encouraged to take an active part in the intervention and

be aware of each other's role in delivery. This would help to embed the concept within the pathway and supported 'organisational' change. Training for all members of the hospital orthopaedic team was therefore provided to increase awareness about return to work issues.

Timing – when should the intervention be initiated?
Given the residual uncertainty following the Delphi process about when the intervention should start, the OPAL investigators reflected on the information from the IM stage 1 needs assessment. It was subsequently decided that the optimal time to initiate an occupational advice intervention was the outpatient consultation during which patients were listed for surgery. This was based on the following factors:

- Patients and hospital orthopaedic team members (AHPs, nurses) take the lead from their surgeon. Surgeons are integral to the delivery of information to their patients who, in many cases, will not contemplate or consider returning to work without their permission. Allied Health Professionals and General Practitioners involved in the care of these patients often defer decisions relating to return to work to the surgeon **(from INTERVIEWS)**.
- In over two thirds of cases the only time the patient sees their surgeon prior to surgery is in the initial outpatient consultation. Surgeons then do not see patients again until the morning of their operation, limiting the opportunity for interaction between the surgeon and their patients **(from SURVEY)**.
- Over 90% of surgeons do not offer routine advice to patients returning to work after surgery and, when it is delivered, it is ad-hoc verbal advice based on anecdote and personal experience. Patients, GP's and the hospital orthopaedic team look to surgeons to lead the return to work process, however they do not routinely provide advice and when they do it is not based on specific guidance or best practice **(from SURVEY/INTERVIEWS)**.
- The pre-operative assessment process is extremely varied between trusts. The composition, timing (sometimes only a week before surgery) and staffing of these services would make it difficult to embed an intervention that fulfils the individualised needs of this patient group **(from SURVEY)**.
- The outpatient consultation is a consistent pillar within the preoperative pathway in all institutions. Early discussion of return to work issues allows adequate time for patients and employers to develop, communicate and instigate a suitable plan to enable early and sustained return to work **(from SURVEY/INTERVIEWS)**.

A pragmatic decision was made to allow access to the return to work co-ordinator up to and including 16 weeks after surgery. Cohort data (*see Chapter 4*) suggested that the majority of patients had returned to work by 16 weeks and this therefore seemed an appropriate time point for the end of the intervention. This should allow some additional time to access the support following the standard post-operative review by the surgical team at 8-12 weeks after surgery when the patient was routinely either discharged back to primary care or offered further appointments (usually at 12 months post operation).

9.4 Summary of occupational advice intervention

The OPAL investigators agreed upon a final version of thirteen patient objectives, nine prior to, and four post-surgery. A total of twenty objectives were agreed on for members of the hospital orthopaedic team, twelve prior to, and eight post-surgery. The final list of performance objectives for patients and staff, alongside the matrices of change and determinants can be found in *Appendix 6, Section 1*. These performance objectives form the 'manual' describing what, when, how and why the specific elements of the intervention are delivered. They are supported by the specific staff roles outlined in section 9.5 and intervention resources and materials described in section 9.6.

The key elements of the intervention are summarised below:

TIMING

- The intervention supported patients throughout their surgical pathway. It started within their outpatient appointment during which they are listed for surgery and continued until 16 weeks after their surgery.

PATIENT IDENTIFICATION:

- All patients in work and intending to return to work after surgery were identified as 'return to work' patients at their initial outpatient clinic appointment. The definition of 'work' included being in full-time, part-time or self-employment. It also included patients who are full or part-time carers or who work as volunteers. The identification process was facilitated by the use of an *occupational checklist* completed by patients prior to their clinic appointment. The checklist was administered by a member of the outpatient clinic team when the patient arrived for their appointment.
- The surgical team used the information on the *occupational checklist* to aid surgical decision-making with respect to surgery and allow an individualised preliminary discussion of 'return to work' with the patient.
- Patients that were subsequently listed for hip or knee replacement surgery (and consent to participate in the OPAL study) were signposted to the OPAL intervention resources (*OPAL patient 'return to work' workbook, employer information resource, website, and local return to work co-ordinator*) by their surgical team.

DELIVERY OF INFORMATION:

- All patients in work and intending to return to work after surgery were provided with the following resources at the point they were recruited in to the OPAL programme (in clinic after they are listed for surgery):
    - *The patient 'return to work' workbook*. This was designed as an 8 step interactive workbook. Completion of the workbook helped patients to list and understand their current job demands, set a provisional return to work date, identify potential barriers and solutions to safe and appropriate return to work and develop a provisional return to work plan that could be shared with their employer/work colleagues. The completion of the workbook was the responsibility of the patient but was overseen by a designated 'return to work' co-ordinator who was a member of the orthopaedic team.
    - *The employer 'return to work' information resource*. This mirrored the information in the patient workbook. It explained the OPAL project, the steps the patient will follow when completing their patient 'return to work' workbook and provided useful information for employers and work colleagues with respect to returning to work after hip and knee replacement. The patient was provided a copy to give to their employer, manager, occupational health link or other significant work colleagues.
    - Signposting to the *OPAL website*: www.opalreturntowork.org.uk. This contained additional information and advice for patients, employers, hospital orthopaedic teams and GPs to access.

ASSESSMENT BY A DESIGNATED MEMBER OF THE ORTHOPAEDIC TEAM:

- All patients were contacted by a *'return to work' co-ordinator* (RTWC) prior to surgery. The 'return to work' co-ordinator was a designated member of the orthopaedic team identified at each site who was involved in the assessment, management or education of hip and knee replacement patients. The *'return to work' co-ordinator* offered support to patients, encouraged

them to complete the *patient 'return to work' workbook* and discussed the plans they have developed. This contact occurred at a minimum of 4 weeks prior to surgery.
- The 'return to work' co-ordinator also encouraged patients to share their plans with their employer if they have not done so already.

SUPPORT, REVIEW and ESCALATION:
- During the course of their assessment the *'return to work' co-ordinator* offered additional support to patients based on need. This decision was made on an individual patient basis having discussed and reviewed the information in the *patient 'return to work' workbook*. Additional support could involve review and input from local therapy teams (in hospital or community) and could be arranged either pre-operatively or post-discharge.
- The *'return to work' co-ordinator* facilitated a mechanism that allowed patients to contact them following their surgery e.g. answerphone or email. If indicated this could prompt further review and referral back in to local therapy services.

COMMUNICATION:
- The intervention included mechanisms and guidance to support communication within the hospital team, between the hospital team and primary care and between the patient and their employer:
    - Signposting 'in hospital' teams (e.g. pre-assessment, ward nurses and doctors, inpatient and outpatient therapy services) to patients in the OPAL programme by the 'return to work' co-ordinator.
    - Guidelines for clinic letters, fit notes, and discharge communication to support communication between secondary and primary care.
    - The *employer 'return to work' information resource* and specific instruction and advice within the patient 'return to work' workbook to assist communication between patient and employer.
    - Communication between the patient and the 'return to work' co-ordinator via the phone/email service.
    - A comprehensive training platform for staff to embed the OPAL programme within the participating units/surgical teams practices.

TRAINING:
- The OPAL intervention provided training for members of the hospital orthopaedic care team who interact with 'return to work' patients to increase awareness of return to work issues across the orthopaedic department.

9.5 Staff roles

The OPAL intervention was embedded within 'usual' care at each of the study sites. The OPAL intervention required a multi-disciplinary team (MDT) approach as evidence from IM stage 1 suggested this was the most effective model for delivery. We therefore identified roles and responsibilities for key staff groups already involved within the care pathway (Outpatient clinic staff, surgeons, ward nurses, ward doctors and therapy teams).

As well as adapting the work of existing staff, additional roles were created. This included the roles of the return to work co-ordinator (RTWC) and deputy. A description of the proposed staff groups involved in delivery of the OPAL intervention and their roles and responsibilities are listed in *Appendix 8, Section 1*.

9.6 Materials and resources

To support the delivery of the OPAL occupation advice intervention, a variety of resources for both patients and staff were developed. These are summarised in table 15. An example of how these materials promoted the desired change objectives, applications and overall message are given in table 16. See OPAL examples of developed materials.

Central to the intervention was the development of the patient 'return to work' workbook. The workbook outlined an 8 step process that allowed the patient to record individualised information about their own return to work process which they could then share with other members of the hospital orthopaedic team, their employer and their GP.

The 'return to work' process that they followed includes the 8 steps described below which were presented in the workbook as a checklist and flow diagram (figures 13 and 14):

1. Assessment of the impact of their hip or knee on their ability to work, the specific demands of their workplace and how surgery might impact on these
2. Setting an approximate date for their return to work
3. Developing a return to work plan
4. Discussing and reviewing their return to work plan with the return to work co-ordinator
5. Discussing and reviewing the return to work plan with their employer and/or their occupational health team
6. Contacting their employer and/or occupational health team after surgery and updating them on their progress
7. Amending their return to work plan based on the recovery after surgery and discussions with their employer, occupational health team and hospital staff.
8. Seeking help after surgery

For examples of the specific tools developed for patients during steps 1, 2 and 3 along with examples of completion please see OPAL examples of developed materials. The return to work plan (Step 3) central to the patient workbook is illustrated in figure 15.

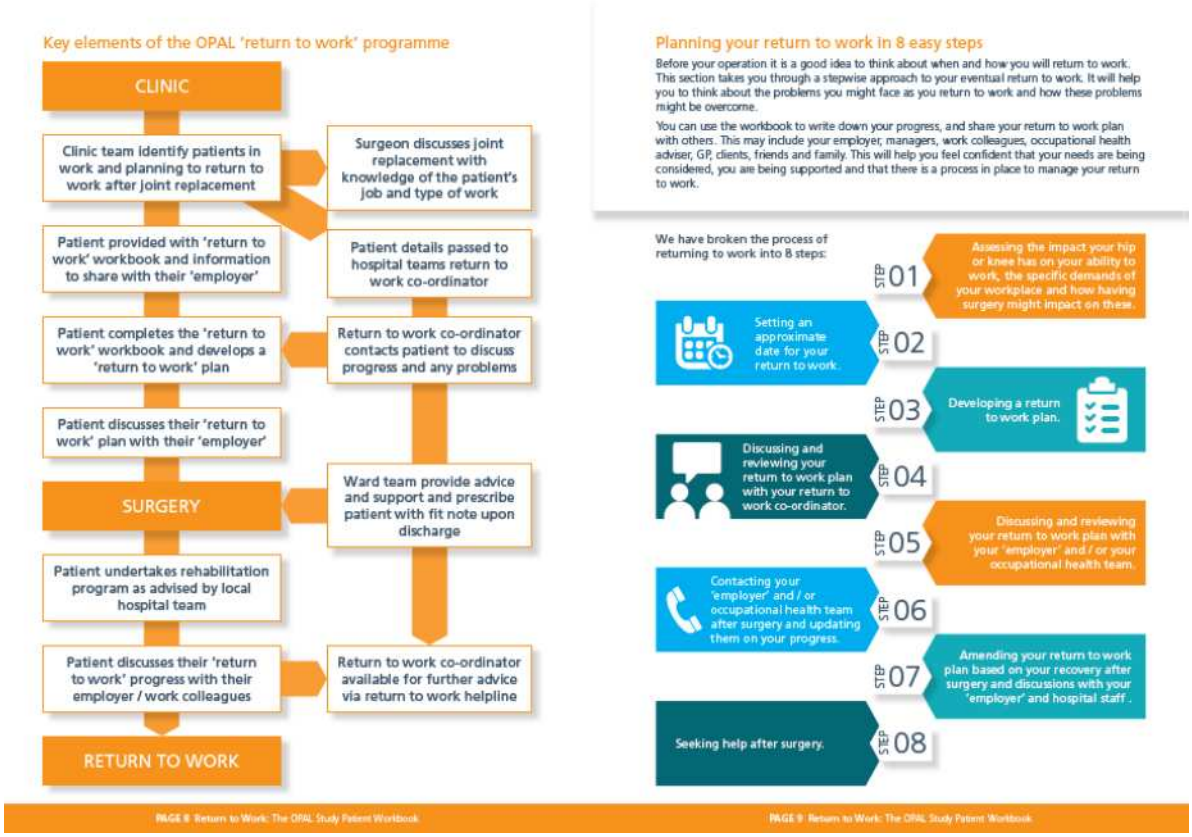

Figure 13: Diagrammatic representation of the OPAL intervention and description of the 8-step process as described on pages 8 and 9 of the patient's workbook

Your OPAL 'return to work' checklist

This checklist outlines the keys steps listed above that we advise you complete to help you return to work. Using the checklist you can see when each step needs to be completed and tick them off once done. Each step is explained further in the next section of the workbook. As you will see most of the steps are best completed prior to surgery.

CHECKLIST

Immediately after your orthopaedic clinic appointment ...

- Read the OPAL workbook and look at the information on the OPAL website (www.opalreturntowork.org.uk) ☐

In the month after your orthopaedic clinic appointment ...

- Use this workbook to:
  - Document the demands of your current job, the impact your hip or knee is having on your ability to work and the problems you anticipate after surgery (STEP 01) ☐
  - Set a provisional timescale for your return to work (STEP 02) ☐
  - Develop a return to work plan (STEP 03) ☐

Please refer to information on the OPAL website as required

At least a month prior to your surgery ...

- You will be contacted by the hospital return to work co-ordinator to: ☐
  - Discuss the information in your workbook and review your return to work plan (STEP 04)
- Meet with your 'employer' and/or your occupational health team to:
  - Provide them with written information given to you by the hospital orthopaedic team about your planned surgery, recovery and return to work ☐
  - Discuss and agree your return to work plan (STEP 05) ☐

After surgery ...

- Follow the postoperative exercises and rehabilitation advice given by your hospital team ☐
- Keep in regular contact with your 'employer' and / or occupational health team and give them information about your surgery, recovery and progress towards a return to work (STEP 06) ☐
- Check your return to work plan and amend as necessary based on discussions with your 'employer' and hospital staff (STEP 07) ☐
- Contact the return to work co-ordinator via the hospital return to work helpline. Telephone: _____ if you are having problems related to your return to work (STEP 08) ☐

Figure 14: Patient checklist for 8-step return to work process as described on page 10 of the patient's workbook

Figure 15: Step 3: Development of a return to work plan as described on pages 16 and 17 of the patients workbook

Table 15: Materials developed for patients and staff

Patient Programme Components	**Description/Content**	**Highlights**
Occupational checklist	Paper checklist to screen patient eligibility for feasibility study and guide consultation with surgeon at initial outpatient clinic appointment	Patient completes details of work situation and tasks
Patient Return to Work workbook	Workbook given to patients at outpatient clinic appointment	Stepped guidance on RTW; Templates for patients to complete on Job Demands, Impact (of joint problem) on Work, Return to Work Plan
Employer workbook	Workbook given to patients at outpatient clinic appointment to give to their employer/colleagues	Information on joint replacement Guidance on how to support the employee RTW
Website	www.opalreturntowork.org.uk	Information about the OPAL study, hip and knee replacement surgery, advice on RTW
Helpline	Phone/answerphone for patients to contact RTWC for further guidance/support following surgery	RTWC checks and responds to messages every 2-3 days. Helpline accessible for 16 weeks following discharge
Staff Programme Components	**Description/Content**	**Highlights**
Staff training	PowerPoint presentations. Generic training for all staff, targeted presentations for specific staff Training/study packs	Overview of study & flowchart; Performance objectives for each job role; Methods of behaviour change; Work modifications; Fit notes; Occupational Health advice
Occupational checklist	Paper checklist to screen patient eligibility for feasibility study and guide consultation with surgeon	Given to patients to complete by outpatient staff, then forwarded to Return to Work Co-ordinator
Return to Work Co-ordinator's Workbook	Booklet to guide Return to Work Co-ordinator in delivering the intervention	Stepped guidance on RTW; Checklist of objectives; Example templates for RTWC to complete to document Job Demands, Impact (of joint problem) on Work, Return to Work Plan
Examples of fit notes	Completed examples of less/more appropriate fit notes to guide fit note completion by ward staff at discharge	Examples of 'not fit' fit notes and 'maybe fit' fit notes
Examples of Job Demands, Impact on Work, Return to Work Plans	Completed examples of templates to be completed by patients in their RTW workbook, informed by experiences reported by actual patients interviewed in Phase 1	Six examples of each pertaining to different job roles and demands
Communication guidance	Written guidance on referring to RTW in clinic notes and discharge letters	A4 sheet giving examples of how to refer to patient's RTW in medical documentation
GP letter	Letter to inform GP of patients enrolment in OPAL program	Provides GP with information about OPAL programme
OPAL study posters, pens, newsletters	Branded study merchandise to increase visibility and awareness of the OPAL study	

Table 16: Examples of design document details

Proposed vehicle	Change objectives grouped by determinant	Methods and practical applications	Message content
Patient materials			
Occupational checklist	*Knowledge and awareness*: Completing a checklist informs the surgeon about work activities and demands *Self-efficacy and skills*: Having the confidence and ability to complete the checklist *Attitudes, beliefs and expectations*: believing that completing an occupational checklist will facilitate RTW following surgery	*Consciousness raising* by outpatient clinic staff *Facilitation* by outpatient clinic staff *Information about other's approval* by outpatient clinic staff	The surgeon is interested in my job and how surgery might impact on it The checklist is not too complex. We have pens and clipboards and we can help you if necessary. The surgeon will be pleased that I have completed the checklist and it will help me RTW
Return to Work workbook	*Knowledge and awareness*: knows key advice and information concerning recovery and RTW *Self-efficacy and skills*: able to acquaint self with key information about RTW *Attitudes ,beliefs and expectations:* believes that revising RTW plan following surgery will aid RTW *Perceived norms*: recognises that RTW is now considered a positive health outcome	*Coherence and imagery*-sections of text have logical order and clearly related with graphics *Verbal persuasion* by Outpatient clinic staff and RTWC *Modelling* Provides examples of how patients have revised RTW plan *Consciousness raising:* information about causes/consequences	The HOT think that my RTW is important and that having this information will help The RTW book has been designed for and approved by patients as something they can use Other patients have revised their RTW plans and this has been helpful Getting back to work is good for health, this is why the health service is focusing on it
Hospital Orthopaedic Team materials			
Staff training	*Knowledge and awareness*: clinic staff know process of asking patients to complete checklist *Self-efficacy and skills*: RTWC expresses confidence in ability to support RTW *Attitudes, beliefs and expectations:* Surgeon believes they should encourage patients to take an active role in their decision about surgery in relation to RTW *Perceived norms*: Asking patients about their RTW plans is good practice	*Individualisation:* through tailored staff training *Facilitation:* Staff training at optimal times/places/methods *Consciousness-raising:* Information about causes/consequences of behaviour *Shifting perspective:* encourage the perspective of another	The checklist is completed by the patient and taken into the consultation to aid their decision about surgery in relation to RTW The training has been delivered according to my needs and work context Surgery impacts on RTW and patients need to be actively involved in the decision It is everyone's role in the HOT to be actively interested in patients' RTW
Examples of Job Demands, Impact on Work, Return to Work Plans	*Knowledge and awareness*: Knowing what is expected from a completed template *Self-efficacy and skills*: Enabling the RTWC to support the patient	*Modelling*: appropriate examples provided for the RTWC to demonstrate completion *Facilitation:* creating an environment that makes the action easier	These are some typical examples based on real patient experiences These will help you support the patient plan their RTW

Chapter 10: Intervention Mapping stages 5 and 6: Implementation and feasibility assessment

10.1 Introduction

During IM Stage 5 an implementation and adoption plan for the intervention was developed. This stage ran concurrently with the Delphi consensus process. The implementation plan focussed on delivery within a small cohort of 5-10 patients at three sites and examined whether the intervention could be delivered alongside 'standard' care.

IM stage 6 evaluated the fidelity of the intervention (was the intervention delivered as planned) by assessing the intervention against the defined patient and staff performance objectives. It also evaluated the quality of the intervention (how did patients, staff and employers feel about the intervention?) as well as establishing preliminary effectiveness and cost. Finally, the feasibility of undertaking a trial using the intervention was assessed using screening, recruitment, consent and follow up procedures and rates at each of the study sites.

10.2 Objectives

Intervention mapping stages 5 and 6 supported study objectives 8 and 9 (*see section 1.5, page 25*).

10.3 IM stage 5: Implementation

10.3.1 Overview

An implementation strategy was developed to support the adoption and implementation of the OPAL intervention at three NHS Hospital Trusts in England. At each hospital a principal investigator was identified (Consultant Orthopaedic Surgeon) to assist the OPAL investigators as they had knowledge of local service structure and personnel. The principal investigators (PI) identified staff members for the OPAL intervention roles (e.g. return to work co-ordinator) based on local service structure and personnel. The person used in the RTWC role was chosen by the principle investigator after discussion with the OPAL research team based on seniority, experience and time available for the role. The PI then planned how the intervention would work alongside 'standard' care at their institution.

Support and clarification were provided by the OPAL investigators when needed, however, the local delivery of the intervention was largely determined by the local teams through negotiation with the principal investigator and nominated return to work co-ordinator. In this way the intervention could be delivered pragmatically alongside current care whilst also stipulating the achievement of specified performance objectives against which the fidelity of the intervention could be assessed. The investigators were then able to support local implementation through training sessions and specific training resources tailored to the roles and clinical areas.

At each site potential users of the intervention were identified using similar eligibility criteria to that used in Phase 1: a) placed on the waiting list for hip or knee replacement during their outpatient appointment with the surgical team b) in work in the 3 months prior to being added to the waiting list for joint replacement and c) intending to return to work following surgery.

10.3.2 Training

OPAL training for hospital staff was undertaken between May and July 2018. Different approaches were required at each site: training logs are provided in *Appendix 9, Section 1*. At Nottingham and South Tees sites, visits were performed on a number of occasions with staff groups from a variety of clinical areas, to ensure coverage within the department. In South Tees, 2 to 3 large group training sessions were held. In Nottingham a more labour intensive 1 to 1 approach was needed after an initial group session failed to include all of the required personnel. In contrast, Northumbria invited 'key' staff to the training (including the principal investigator, nominated RTWC and members of the local research team). The RTWC then facilitated the implementation of the OPAL intervention at this site though a systematic series of training with the local team, collating the information and materials needed by each team member and cascading this internally as required.

To support training, the patient and staff materials produced to support the OPAL intervention were made available to each site as 'site files' that could be stored and used for reference in clinical areas delivering the intervention (outpatients, wards, RTWC office). To supplement these materials, specific training resources were created including worked examples of completed study paperwork and fit notes, and training PowerPoint slides. A full list of training resources can be found in *Appendix 9, Section 2.* For examples see OPAL examples of developed materials.

10.3.3 Performance objectives to support implementation

As part of the implementation strategy, the OPAL investigators identified a number of performance objectives required to facilitate adoption at each site:

The performance objectives were to:

- Recruit the participating sites and principal Investigators
- Recruit the Return to Work Coordinator
- Train staff in delivering the OPAL intervention
- Support the staff in delivering the OPAL intervention

The performance objectives for the local site (Principal Investigator (PI) and RTWCs) were to:

- Familiarise themselves with the OPAL intervention and associated materials
- Inform and enthuse their hospital orthopaedic team about the study, and promote engagement
- Identify potential Return to Work Coordinators and deputies (PI role)
- Identify surgeons willing to support their patients' involvement in the study
- Arrange training events/meetings between the hospital orthopaedic team and the OPAL investigators
- Set up a helpline for patients to access RTWC
- Support team in identifying existing staff members to act as OPAL Champions for their sub-team (e.g. out-patient clinic, ward, therapy team)

As this was a feasibility study, the implementation strategy focussed around adoption for a 6 to 8 week period during which the hospital orthopaedic team were to deliver the intervention. As such it was not necessary to identify future adopters and maintainers of the programme.

Determinants matrices for dissemination/adoption/implementation actions

Having identified performance objectives, determinant matrices were created to support behaviour change and provide actions and outcomes to facilitate adoption. Change matrices for the OPAL investigators and principal investigators and RTWCs are shown in tables 17 and 18. These matrices were then used as the framework for training at each site.

Table 17: Personal determinants for the OPAL investigators used to develop the dissemination/adoption/implementation strategies within the 3 feasibility sites

OPAL investigators	Personal determinants			
Performance objectives for programme implementation	**Outcome expectation**	**Knowledge**	**Attitudes**	**Perceived norms**
Recruit the participating sites and Principal Investigators at each site	Expect that recruiting sites and PIs is possible and will facilitate the feasibility study	Can describe how and when site and PIs will be recruited	Believe recruitment of sites and PIs is important and necessary for a study such as OPAL	Recognise that recruiting sites and PIs is a usual step when conducting a feasibility study
Recruit the Return to Work Coordinator at each site	Expect that recruiting a RTWC at each site is possible and will facilitate the feasibility study	Can describe how and when a RTWC can be recruited at each site	Believe that the recruitment of a RTWC at each site is important and necessary	Recognise that recruiting RTWC at each site is a usual step when conducting a feasibility study
Train staff at the sites in delivering the OPAL intervention	Expect that training staff at each site in delivering OPAL is possible and will facilitate the feasibility study	Can describe how and when staff at each site will be trained in the delivery of OPAL	Believe that the training of staff to deliver OPAL at each site is important and necessary	Recognise that training staff in the delivery of OPAL at each site is a usual step when conducting a feasibility study
Support staff at the sites in delivering the OPAL intervention	Expect that supporting the staff at each site is possible and will facilitate the feasibility study	Can describe how and when staff at each site will be supported in the delivery of OPAL	Believe that supporting staff at each site to deliver OPAL is important and necessary	Recognise that supporting staff in the delivery of OPAL at each site is a usual step when conducting a feasibility study

Table 18: Personal determinants for the principal investigators and RTWCs. Determinants describe the personal and institutional changes the local research team needed to make to support dissemination/adoption/implementation within the 3 feasibility sites

PIs Performance objectives for programme implementation	Personal determinants			
	Outcome expectation	**Knowledge**	**Attitudes**	**Perceived norms**
Familiarise themselves with the OPAL intervention and associated materials	Expects that reading and learning about the OPAL intervention will facilitate adoption through the feasibility study	Can describe the structure, content, delivery and format of the OPAL intervention. Can describe how they will impart this information to their HOT	Believes the OPAL intervention is useful and that the materials created support is adoption and implementation	Recognises that understanding the OPAL intervention enables them to lead the adoption and implementation at their site and that is a usual step when conducting a feasibility study.
Inform and enthuse their hospital orthopaedic team about the study and promote engagement	Expects that enthusing their HOT about the study is possible and will facilitate the feasibility study	Can describe how and when they will enthuse their HOT staff in the delivery of OPAL	Believes that enthusing their HOT staff to deliver OPAL at each site is important and necessary	Recognises that enthusing staff in the delivery of OPAL at each site is a usual step when conducting a feasibility study
Identify potential Return to Work Coordinators at each site and deputies	Expects that identifying the RTWC and deputy at their site is possible and will facilitate the feasibility study	Can describe how and when they will identify a potential RTWC and their deputy at their site	Believes that enthusing their HOT staff to deliver OPAL at their site is important and necessary	Recognises that identifying RTWC and deputy at their site is a usual step when conducting a feasibility study
Identify surgeons willing to support their patients' involvement in the study	Expects that identifying surgeons who are willing to support their patients' involvement in the study is possible and will facilitate the feasibility study	Can describe how and when they will identify surgeons at their site who are willing to support their patients' involvement in the study	Believes that identifying surgeons at their site who are willing to support their patients' involvement in the study is important and necessary	Recognising that identifying surgeons at their site who are willing to support their patients' involvement in the study is a usual step when conducting a feasibility study
Arrange a training event/meeting at the site between the HOT and the OPAL investigators	Expects that arranging a training event/meeting at their site between the HOT and the OPAL investigators is possible and will facilitate the feasibility study	Can describe how and when they will arrange a training event/meeting at their site between the HOT and the OPAL investigators	Believes that arranging a training event/meeting at their site between the HOT and the OPAL investigators is important and necessary	Recognises that arranging a training event/meeting at their site between the HOT and the OPAL investigators is a usual step when conducting a feasibility study
Support team in setting up a helpline for patients to access RTWC	Expects that supporting their HOT in setting up a helpline for patients to access the RTWC is possible and will facilitate the feasibility study	Can describe how and when they will support their HOT in setting up a helpline for patients to access the RTWC	Believes that supporting their HOT in setting up a helpline for patients to access the RTWC is important and necessary	Recognises that supporting their HOT in setting up a helpline for patients to access the RTWC is a usual step when conducting a feasibility study

10.4 IM stage 6: Feasibility

10.4.1 Methods

The methods used for the 'feasibility' stage were similar to the methods used in IM stage 1[140]. Questionnaire and interview data was collected from patients returning to work after hip and knee replacement. Assessment of the intervention considered four inter-related themes:

1) Assessment of intervention fidelity (Were the stated performance objectives delivered?). Data collected from participants was mapped against the final staff and patient performance objectives (POs). Evidence was collected from a variety of sources including the baseline and follow up questionnaires, the patient RTW workbooks (evidence of patient activity) and the RTWC checklists (evidence of RTWC activity) for each patient. All POs were assessed except for PO.10 (Patient communicates with employer regarding surgical outcome and progress/recovery, by phone, email or face-to-face) and PO.13 (Patient adheres to postoperative rehabilitation plan and advice) due to an omission on the post-operative questionnaires. Examples of the evidence sources used to determine intervention fidelity for the patient and staff POs are available in table 19. A complete description of the evidence sources for all POs are described in *Appendix 9, Section 3.*

2) Assessment of intervention quality (What did patients, staff and employers feel about the intervention and how it was delivered?). Structured interviews explored patient and stakeholder (hospital orthopaedic team members and employers) perceptions of the intervention. Interviews explored the understanding, opinions and experiences of the intervention and the study processes associated with its delivery in the context of a research study.

3) Assessment of feasibility data (Did the intervention facilitate early supported return to work?). Data collected from the feasibility study (rates and timing of return to work, functional outcomes scores, health utility measures, work related scores) were compared to similar data collected in IM stage 1 to generate a preliminary comparison of patients that did (IM stage 6) and did not (IM stage 1) receive the OPAL intervention.

4) Assessment of economic data (How much does the intervention cost to deliver and what is the associated health utilisation?). Healthcare utilisation data were collected using questionnaires allowing costs to be assigned to activities. In addition, costs were attached to data collected in the RTWC checklist that documented the time spent by the RTWC supporting the delivery of the intervention. The timing of return to work after surgery in patients receiving the intervention was also explored.

IM stage 6 also supported collection of other key information such as a) patients' and surgeons' views on their willingness to participate in a future trial b) potential rates of recruitment and proportion of eligible patients consenting c) information about the behaviour and distributional characteristics of 'return to work' outcomes that would inform the power calculation for any subsequent trial. It therefore captured data that allowed recommendations about the conduct of a future trial to be made.

Table 19: Examples of the evidence used to assess intervention feasibility (*see Appendix 9, Section 1* for all POs)

PATIENT POs		
Performance Objective	Evidence of completion	Evidence source
PO.1 Patient completes occupational checklist prior to appointment with surgeon	1. Evidence that the checklist has been completed 2. Evidence that the patient recognises the checklist has been completed (cohort) 3. Evidence of checklist completion recorded in the RTWC workbook	1. Occupational checklist 2. Baseline questionnaire 'Section 1' 3. RTWC workbook 'Task 1'
PO.2 Patient makes informed decision about surgery with respect to work	1. Evidence that the patient recognises the surgical team supported an informed decision about surgery with respect to work (cohort)	1. Baseline questionnaire 'Section 1'
PO.3 Patient acquaints self with key information about recovery and RTW provided in the patient RTW workbook and associated online information resources	1. Evidence that the patient workbook has been completed 2. Evidence that the patient has spent time completing the patient workbook (cohort) 3. Evidence that the patient has accessed the OPAL website (cohort)	1. Patient workbook 'Steps 1-3' 2. 8 week questionnaire 'Section 7' 3. 8 week questionnaire 'Section 7'
STAFF POs		
Performance Objective	Evidence of Completion	Evidence source
PO.10 *RTWC* highlights RTW patients to ward teams managing *pre-op education and assessment* and records this action in RTWC workbook	1. Evidence that RTWC contacted pre-assessment teams (RTWC workbook)	1. RTWC workbook 'Task 4'
PO.11 *RTWC* highlights RTW patients to *the ward teams* when admitted for surgery and records this action in the RTWC workbook	1. Evidence that RTWC contacted ward teams (RTWC workbook)	1. RTWC workbook ' Task 5'

Feasibility study

Participants were recruited from three sites (South Tees, Nottingham, Northumbria). Participants were asked to complete questionnaires at baseline (pre-operative when listed for surgery) and at 8 and 16 weeks after surgery as in IM stage 1, to allow comparison with data collected during this stage. The aim was to recruit 30 patients.

All patients attending hip and knee replacement clinics at the study sites were screened, prior to their surgical appointment, using the developed occupational checklist (*see OPAL examples of developed materials*). This checklist was taken in to the appointment, providing the surgeon with information about their work and work related activities that could be considered as part of the decision to offer surgery. Where patients were offered surgery, the surgeon confirmed eligibility and facilitated referral to the local research team for further information about the OPAL study, for consent and enrolment. Patients who consented were then provided with the OPAL resources (patient and employer workbooks, website access) and their contact information passed on to the RTWC. The design of the feasibility study is shown in figure 16.

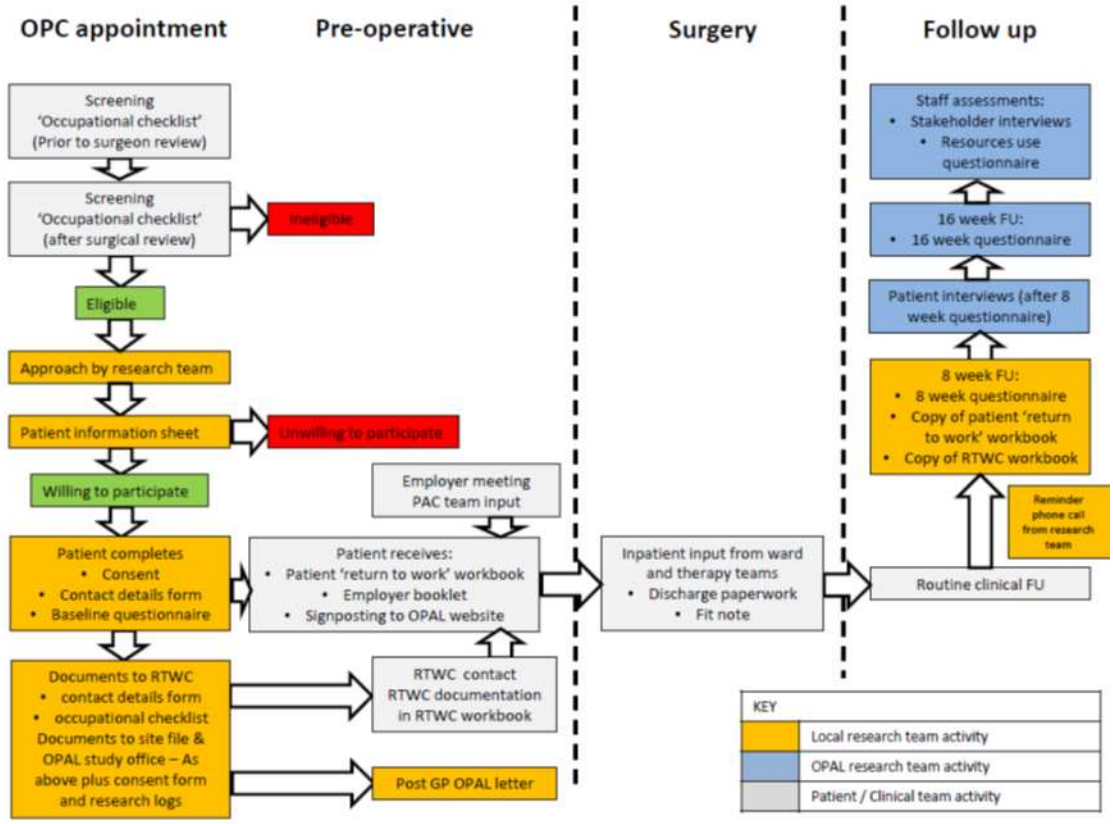

Figure 16: Feasibility study design

Inclusion / exclusion criteria for the cohort study

Inclusion criteria for patients recruited into the cohort /interview elements of the feasibility assessment during IM stage 6:

- Age 16 years and above
- Listed for primary hip or knee replacement
- In work in the 3 months prior to listing for surgery (including Full time, Part time, Paid & unpaid job roles): equates to approximately 6 months prior to surgery
- Intending to return to work following surgery

Exclusion criteria

- Lack of mental capacity to understand and participate in the cohort study
- Not understanding written and spoken English
- Emergency surgical procedure e.g. Surgery for an indication of trauma
- Surgery for cancer or infection

Patient and Stakeholder interviews

The information from the feasibility study was supplemented by a further 15 patient and 12 stakeholder interviews (sampling from employers, allied health professionals, nurses, GPs, orthopaedic surgeons) across the study sites. Patient interviews were undertaken at 8 weeks post-surgery. Stakeholder interviews were undertaken once all patients at the site had received surgery. (i.e. once all patients were recruited and had been through the pre-operative phase of the intervention). The sampling strategy for the stakeholder interviews is given in table 20.

Table 20: Interview strategy for the feasibility assessment

Interviewees	Suggested timescale
RTWCs (x3)	Once all patients had been recruited and had as a minimum been through the pre-operative phase of the intervention
Employers (x3)	To be interviewed post-employee/patient interview i.e. 8+ weeks post-surgery
GPs (x2)	Interview post-patient interview i.e. 8+ weeks post-surgery
Surgeons (x2)	Interview post 8 week follow-up
Rehab/ward staff (x2)	Once all patients had been recruited and had as a minimum been through the pre-operative phase of the intervention

10.4.2 Results

Feasibility recruitment commenced 1st June 2018 and ended 14th August 2018. A total of 147 patients were screened of which 35 (24%) were eligible for recruitment. In total 26 of a planned 30 patients were recruited (11 at Northumbria, 8 at South Tees and 7 in Nottingham) (Figure 17). Consent forms, contact details forms and baseline questionnaires were received from all 26 participants. Four participants were withdrawn from the study for the following reasons: participant's care transferred to a neighbouring trust (n=1); surgery deferred until later in the year at the participant's request (n=1); participant requested withdrawal from the study (n=2). A further participant had their surgery delayed due to medical reasons and was still awaiting surgery when follow up for the feasibility was closed (surgery date 22nd March 2019). A total of 21 participants were included in the analysis. Follow up data was received from 18 participants at 8 weeks and 14 patients at 16 weeks. Copies of the patient workbooks and RTWC checklists were received for 10 and 19 of the 21 remaining participants respectively. The results are presented under the headings of the four inter-related themes.

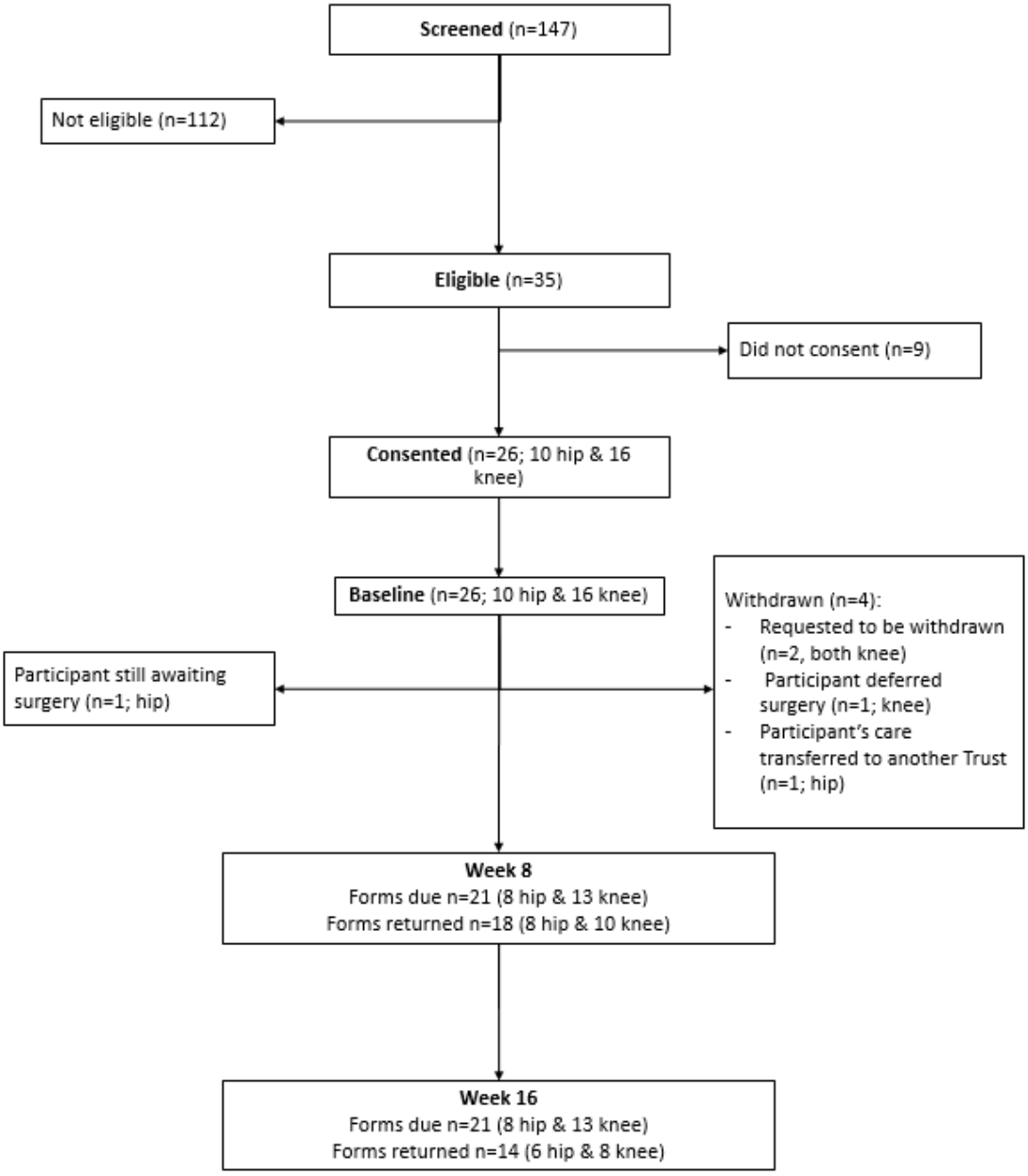

Figure 17: Flow of patients through the feasibility study

10.4.2.1 Assessment of intervention fidelity

Data from the questionnaires was mapped against each of the participant and staff performance objectives (POs) for all 26 participants (Tables 21 and 22).

Patient performance objectives

For the 21 participants with follow up data the rate of delivery of the 13 patient POs was 205 of 273 (75%). This improved to 205 of 231 (89%) if POs 10 and 13 were removed.

Table 21: Analysis of intervention delivery against patient performance objectives (POs) for all 26 patients

- Green: Evidence from at least one source that the stated PO was delivered
- Red: No evidence that the stated PO was delivered and was therefore assumed not to have been delivered
- Orange: POs 10 (Patient communicates with employer* regarding surgical outcome and progress/recovery, by phone, email or face-to-face) and 13 (Patient adheres to postoperative rehabilitation plan and advice) were not assessed during the 8 week follow up assessment and therefore no evidence was available for these POs.
- Grey: Patient withdrawn or surgery delayed

ID	Patient Objectives Fidelity Assessment Checklist												
	PO.1	PO.2	PO.3	PO.4	PO.5	PO.6	PO.7	PO.8	PO.9	PO.10	PO.11	PO.12	PO.13
1060													
1061													
2060													
2061													
2062													
2063													
2064													
1262													
2260													
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2367													

Table 22: Analysis of intervention delivery against staff performance objectives (POs) for all 26 patients

- Green: Evidence from at least one source that the stated PO was delivered
- Red: No evidence that the stated PO was delivered and was therefore assumed not to have been delivered
- Grey: Patient withdrawn or surgery delayed

ID	Staff Objectives Fidelity Assessment Checklist																			
	PO.1	PO.2	PO.3	PO.4	PO.5	PO.6	PO.7	PO.8	PO.9	PO.10	PO.11	PO.12	PO.13	PO.14	PO.15	PO.16	PO.17	PO.18	PO.19	PO.20
1060																				
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The rate of delivery for all the assessed POs was >85% except for PO.11 (Patient revises RTW plan following surgery as necessary with their employer and hospital staff) in which the rate of delivery was only 9 of 21 (43%). However, many participants might not have had to revise their RTW plan and so a negative response for this PO might simply reflect the fact that the RTW plan they made prior to surgery was adequate.

Staff performance objectives
For the 21 participants with follow up data, the rate of delivery of the 20 staff POs was 312 of 420 (74%). The rate of delivery for the POs was at least 85% with the exception of PO.10 (71%), PO.11 (81%), PO.16 (52%), PO.17 (38%), PO.18 (0%), PO.19 (0%) and PO.20 (33%). POs 10 and 11 related to the RTWC highlighting OPAL participants to the pre-operative education and assessment teams and ward staff. This activity was evidenced from the RTWC checklist and was generally well recorded. PO.16 covered fit note prescription on the ward after discharge and was assessed by the participant's report of receiving a fit note. PO.17 involved the RTWC checking the phone line for participant contacts, however, in many cases the RTWC did not document in the individual participant RTWC checklists that they had checked the phone line, although the RTWC interview data suggested they performed this task regularly. The observed rate of delivery may therefore be falsely low and not reflect actual practice. PO's 18 and 19 related to communication between the hospital orthopaedic team and the GP through the ward discharge and outpatient clinic letters. As it was not possible to obtain copies of all clinical correspondence from the study sites, this could not be investigated further.

10.4.2.2 Assessment of intervention quality

a. Patient Interviews
Fifteen patients were interviewed across the 3 study sites. The patient interviews conducted in IM stage 6 explored the following three themes:

- Understanding of the OPAL intervention
- Views about the OPAL intervention
- Experience of participating in OPAL

Summaries of the analysis for each identified themes are described below. Direct quotations supporting these themes are provided in *Appendix 9, Section 4.*

Understanding of the OPAL intervention
Two patients felt OPAL was an exercise in information collection, others an attempt to help patients RTW and 'normality' after surgery. Some perceived OPAL as aiming to involve stakeholders and patients in the RTW process. One patient believed earlier RTW was the goal and questioned whether OPAL was for the benefit of the employer rather than the patient. Some believed it examined occupational health services and others that it would aid RTW through more intensive physiotherapy.

Views about the OPAL intervention
Several patients believed OPAL provided advice and information about RTW after surgery. Some valued recording what their work entailed as it helped focus their RTW. As the intervention started preoperatively, it gave more time for the patient to engage. However, not all of the participants felt work should be the primary focus and some prioritised 'getting their life back'. Some questioned whether RTW was the role of hospital clinicians. Others believed OPAL did not apply to them because their 'work' was voluntary, or their employers already had procedures in place. Some felt they didn't need help from the RTWC because they were able to manage their RTW, or perceived it couldn't help them.

Experience of participating in OPAL
Twenty (76.9% of all participants, 95.2% of those followed up) participants reported being issued with OPAL patient and employer workbooks by the research nurse. Other than a telephone call, there was little reported engagement with the RTWC.

Return to Work Workbook
Participants, who were in paid employment and completed the workbook, were positive about it, although their employer did not always take up their RTW plan. This put the emphasis on the employee to implement the plan. Other participants found the RTW workbook informative and two reported that it had helped inform their fit note. Another saw the workbook as the opportunity to formalise plans, but did not consider it applicable to their employment situation where sickness absence procedures were in place.

One self–employed participant used the workbook to write down all their tasks, aiding their RTW by identifying components of the job they could do. Another self-employed participant found the workbook of limited value as they considered they needed to go to back to work immediately for financial reasons. One participant stopped completing the workbook, concerned that it might be shared with their employer and used against their best interests. Another who was office-based, felt not all the steps in the workbook applied to them, compared with someone in a more physically demanding role.

Employer's Workbook
Participants reported passing the workbook onto their employer. Some reported that their employer read the workbook and used it to direct their RTW interview. One participant saw that the employer had consulted the workbook but believed that organisational policies superseded it. Others reported that their employer looked at it, but did not discuss the implications of the information with them. One participant felt that, due to the size of the business and lack of opportunity for modifications, the employer considered the information inappropriate. Another thought it might have intimidated their occupational health adviser.

OPAL Helpline
Few patients reported using the helpline because either they didn't need to, or weren't aware of it. One used it to ask about fit notes and benefits.

OPAL Website
The majority of patients did not visit the website.

Interaction with the local OPAL delivery team
Patients reported limited face-to-face contact with the RTWC. Most received phone calls or emails from the RTWC prior to surgery as well as a follow up call/email that they had found helpful. A number of patients reported that OPAL interaction was mainly with the research nurse.

Participants expressed some disappointment that their expectations around OPAL were not realised. Some reported lack of knowledge and communication within the hospital orthopaedic team regarding OPAL. Others felt the orthopaedic team were doing an excellent job but felt there was limited focus on RTW.

b. Stakeholder interviews
Summaries of the analysis for each stakeholder group are described below. Direct quotations supporting these analyses are provided in *Appendix 9, Section 3.*

Employers
Two employers were interviewed from one study site. Both worked for public sector organisations reporting comprehensive RTW procedures. One employer was responsible for 30 staff, the other for 125 staff.

Both were aware of their employee's involvement in OPAL and felt they understood its purpose. Both had seen the employer workbook. Both had used the workbooks to prompt discussion of the RTW plan and to inform their understanding of recovery. They believed the workbook helped employees clarify and record the RTW process, and provided an opportunity for the two parties to agree the RTW plan. The information prompted consideration of work modifications/issues that might delay a full RTW. The workbooks were perceived as easy to use, although some language was considered over-technical. One respondent felt there should be one combined employer/patient workbook, accessible to everyone involved. One felt there should be more included about the individual, such as information about follow-up, and seeking advice if the employee was not progressing as expected.

Both employers received fit notes from their employees, although neither reported that they were informative. One believed interventions like OPAL could become standard practice in their organisation. The intervention gave more detail than their occupational health team were able to provide, and they felt it could be adapted for other health conditions.

Orthopaedic Surgeons
Two surgeons were interviewed, from two study sites. Both were aware of OPAL, and had patients receiving the intervention. Neither had attended face-to-face training. One reported viewing the online training, although had difficulty recalling it. For one surgeon, attending training would not be justified unless OPAL became embedded in the service, in which case face-to-face group training would be preferable.

Neither had had contact with the RTWC in relation to OPAL or seemed clear about the RTWC role. Both were aware of the patient workbook, one had looked at it and seemed to understand how it might be used. Neither had seen the employer workbook, or were aware of the helpline.

One surgeon relied on the research nurses to implement OPAL, the other reported a more active role and discussed the patient workbook with their patients. It seemed OPAL did not change their documentation of patients' work issues. Both considered OPAL a good idea. One felt it made them more aware about RTW and changed their consultation practice. One thought it should be of value to most patients, although one of their patients had not engaged even though they appeared to be in need of RTW support. One respondent felt the intervention should be restricted to those in paid employment who needed to negotiate their RTW with an employer. One saw the intervention as a tool for patients rather than surgeons. The other considered that within their role and time available, it was not possible to provide occupational counselling, despite believing that this should happen.

Return to Work Co-coordinators
Three RTWCs were interviewed, one from each site. All had received training. One RTWC, who received face-to-face training, felt too much information was imparted and another felt that the ward team should have been more involved. Another received individual training which was viewed positively, however, they would have preferred group training to allow them to appreciate others' roles.

In some cases difficulties in obtaining surgical information led to delays in contacting patients. One RTWC attempted to meet every recruited patient preoperatively, preferring face-to-face contact. The RTWCs commented that it was difficult to contact all patients particularly during office hours, so one RTWC mainly communicated by email. Two RTWCs reported contacting patients again on the ward after surgery, one also tried to contact each patient following discharge.

Completion of workbooks was seen as the responsibility of the patient supported by the research nurses. RTWCs did not necessarily see the completed workbooks. Some RTWCs reported encouraging patients to bring workbooks to hospital appointments, although they were unsure of the purpose of doing this.

Two RTWCs informed patients about the OPAL website but none believed patients had accessed this, nor had the co-ordinators. All RTWCs reported making patients aware of a helpline but only one received a RTW-related call. Another had been contacted by email, but had subsequently failed to reach the patient by phone.

One RTWC found their role unclear. They were unsure if the purpose of OPAL was for patients to RTW earlier, or in a 'safe and structured' way. The same RTWC understood their role included answering patients' work- related questions, but weren't confident they had all the necessary skills to do this. Another RTWC perceived their role to be administrative.

The RTWCs' opinion of OPAL was positive. There was general support for OPAL, although there was a view that it might not be appropriate or necessary for all patients. More appropriate completion of the fit note was considered a benefit, and they thought that OPAL provided additional information and opportunities to discuss work in more detail, and that patients benefitted from receiving more support pre-operatively. Organisational issues were viewed as a problem, such as keeping track of the dates of surgery, preadmission and education groups, as these often changed. One interviewee reported having insufficient information packs for all staff, another that there was too much paperwork and the structure and format could be improved. One RTWC suggested a proforma script to use when initially contacting patients.

Patient feedback to the RTWCs as generally good, although some patients were not keen on completing the paperwork, and felt there was too much. Patients required varying levels of support. Not all patients wished to share information with their employer and some were influenced by their family. As regards the most appropriate person to carry out the RTWC role, one perceived that good communication skills and knowledge of orthopaedics were key. Another perceived it as an administrative role with back-up from the hospital orthopaedic team. The other believed that therapists were more suited as they had the skill-set to advise on work modifications.

Hospital Orthopaedic Team

Two senior members of nursing staff, from two study sites, were interviewed. One interviewee received face-to-face training from their PI, which they perceived positively. The other interviewee had not received any training and felt they knew little about OPAL.

One interviewee was unaware of the RTWC at their site. The other knew the individual, but seemed uncertain about their role. Both were aware of the patient workbook but only one had seen it. This nurse reported advising patients about its completion and taking it to appointments. One nurse had seen patients completing the workbook in hospital rather than prior to admission.

One nurse believed OPAL promoted discussions about RTW and reassured patients that their RTW was important. The other interviewee reported less involvement with the delivery of the study and felt it had not changed their practice. The interviewee who had seen the workbook viewed it positively.

One interviewee believed OPAL resulted in more patients being offered a fit note. This interviewee believed the hospital should be supporting patients to RTW and that the process had been successful. The other interviewee felt the OPAL information could be delivered by a nurse, but that patients preferred to get direction from the hospital consultant.

GPs
The intention was to interview two GPs of patients recruited to the feasibility study, however there was no response from those contacted, despite reminders.

10.4.2.3 Assessment of feasibility data

The participants in the feasibility phase were similar to those in the cohort phase; participant characteristics, job titles, and details on the activities relating to their jobs can be found in *Appendix 9, Section 5*. The flow of participants through the feasibility study is shown in Figure 17. The average questionnaire return rate was 69.6% (*see Appendix 9, Section* 5).

Interaction with the intervention
At baseline, most participants completed the occupational checklist prior to their appointment with the surgical team and stated it was referred to during their consolation (76.9% for both); on average it took 10.7 minutes to complete. Twenty-two (84.6%) participants talked about their job when discussing the options for treatment, twenty-three (88.5%) stated a surgical team member mentioned the OPAL program, but only 18 (69.2%) discussed how and when they might return to work. All but one of participants had the OPAL program explained to them. These results suggest the initial introduction to the OPAL program was implemented.

In contrast, only two participants stated that they had contacted the RWTC by phone following their operation (4.8% of those followed-up), and two had used the website. Seventeen of the eighteen (94%) responders at 8 weeks had completed the workbook. Patient took an average of 38.6 minutes to complete the workbook (range 5 to 90 minutes). Twelve of the eighteen (66.7%) found the workbook helpful, and nine (50.0%) said it helped them to develop a return to work plan. Full details can be found in *Appendix 9, Section 5.*

Returning to work
At 8 weeks, seven of the 17 responders had returned to work. At 16 weeks, a further three participants had returned to work. Overall, 38.5% (10 of 26) of the participants in the feasibility phase stated that they had returned to work; however, 26.9% of the participants (including those who were not followed-up) provided no data for this question. Of the returnees, there were 5 hip and 5 knee replacements.

The average return time was 7.4 weeks (ranging 0.6 to 17.7 weeks) (Figure 18). This was approximately 2.6 weeks on average earlier than in the cohort phase, however it should be noted that the sample size here was significantly smaller than in the Phase 1 cohort study. There was a difference in return times for the two types of operation with hip patients returning on average 5.2 weeks after surgery, compared to 9.7 weeks for knee patients. Of those who returned to work,

seven (70.0%) did so with reduced hours, on average 13.7 hours (ranging 6 to 20 hours). Full details can be found in *Appendix 9, Section 5.*

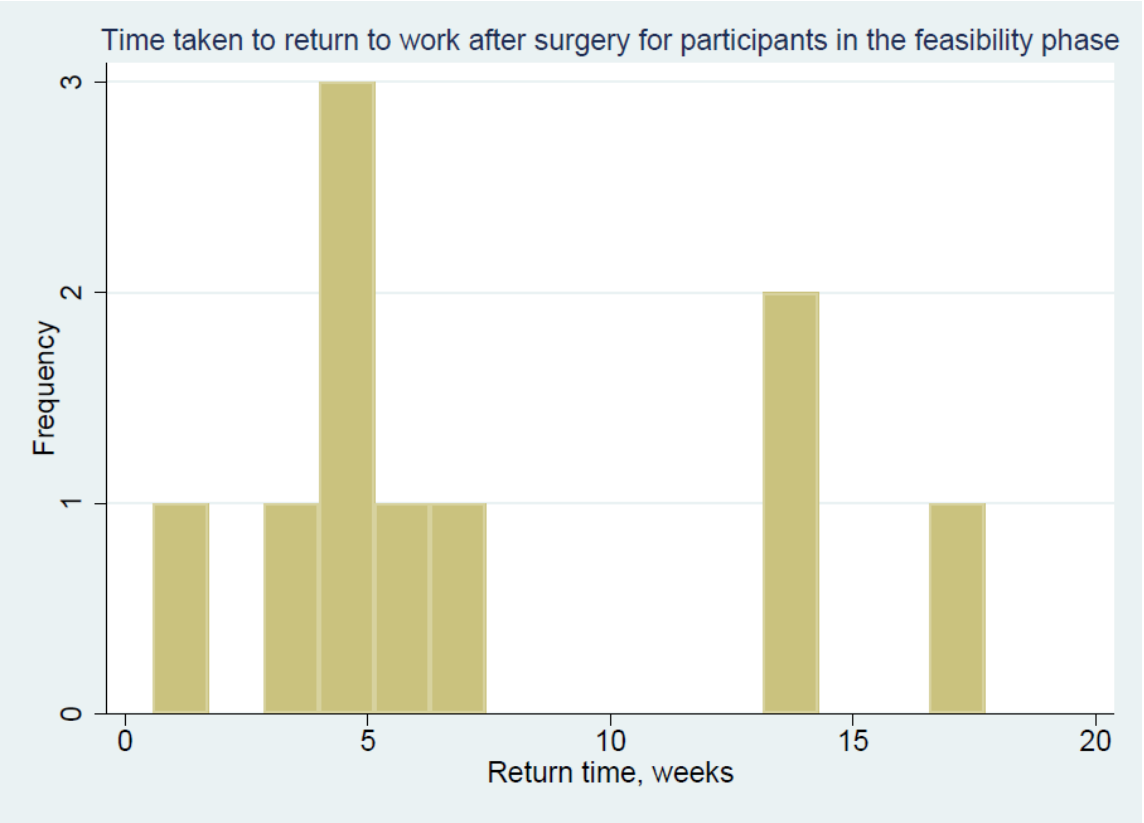

Figure 18: Bar chart of time to return to work after surgery for the participants in the feasibility study

Fit notes

On average, participants requested 1.6 additional fit notes after discharge (range 1 to 3). The average length of fit notes reported at 8 weeks was 6.1 weeks (ranging 0 to 12 weeks) (*see Appendix 9, Section 5*).

Oxford Hip & Knee Score

At baseline the average Oxford Hip and Knee Score were 17.4, and 17.3 respectively; this was comparable to the Phase 1 cohort study. This increased to 35.6 for hip participants and 29.2 for knee participants eight weeks post-surgery; and to 43.0 for hip and 29.4 for knee participants at week 16. These follow-up results were similar to those in the Phase 1 cohort (*see Appendix 9, Section 5*).

Workplace limitation questionnaire

As in the initial cohort study, participants completed the WLQ[125, 141-143] at each time point, to indicate time lost at work. At baseline there was an average of 41.4% time loss due to their joint problems, this decreased to 23.1% at week 8 and 17.6% at week 16. These results are similar to those seen in the phase one cohort (39.4%, 16.8% and 16.8% across the corresponding time points).

Self-Efficacy

The General Self-Efficacy Scale was included in the feasibility phase baseline questionnaire. This was included on the advice of trial steering committee members as it was a variable felt to be important that we failed to collect in the Phase 1 cohort study. This scale ranges between 10 and 40, with

higher scores indicating higher self-efficacy. The participants had an average score of 32.6 (range 22 to 40), implying good self-efficacy; the full results can be found in *Appendix 9, Section 5.*

Readiness to return to work
The Readiness for RTW scale[144] was included in the follow up questionnaires. This scale has two sections, one for those already back at work (13 questions), and those who are not yet there (9 questions). The scale asks participants to indicate how well they agree with a selection of statements, from 'Strongly Disagree' to 'Strongly Agree' and are scored on a 5-point Likert- scale. Full results can be found in *Appendix 9, Section 5*. In the case of those not back at work, the results indicated that participants wanted to get back to work, thought it was possible, and were working towards achieving it. At week 8, 50% of the respondents stated that they did not think they were ready to go back to work, and 40% had not yet set a date for their return. Of those who had returned to work, the responses indicated that they were working towards staying at work, had found strategies to make it possible to be at work, and were not concerned about having to take more time off.

10.4.2.4 Assessment of economic data

Health care resource use and EQ-5D data were collected with the items used the same as those collected during phase 1. The findings are summarised in *Appendix 9, Section 6* separated according to whether the resource utilisation was in relation to participants' joint replacement or for 'another reason'. The intervention was costed using information from the return to work co-ordinators who were involved in the intervention, and also the cost of training and printing of the materials.

Return to work coordinator time and intervention costs
Information recorded by the three RTWCs detailed the individual tasks undertaken as part of their role. Costs were attached to the average total time spent on these tasks, to generate an average cost per participant of £52.87. This was based on the RTWC spending 1.01 hours per participant, on average, costed at £53.24 per hour of RTWC time (using details on the RTWC's bands, with their associated salaries sourced from PSSRU Unit Costs 2018 – *see Appendix 9, Section 6*).

In addition, the RTWC training cost associated with the intervention (£10.91) was incorporated; based on the cost of the RTWC's for one day of their time (using the costs outlined in *Appendix 9, Section 6*) and a trainer for 1.5 days (1 day at training event plus 0.5 days preparation time), i.e. a total cost of £2,181, divided by the number of individuals they would be likely to work with over 12 months, which was assumed to be 50 for each RTWC. The cost of printing the intervention materials (£6.37 per participant; *see Appendix 9, Section 6*) was also estimated. The resulting estimated total cost of the intervention was £70.52 per patient.

Resource use and total costs
Summaries of participants' resource use and the average costs for each item of resource use can be found in *Appendix 9, Section 6.* Regarding health care utilisation in relation to participants' joint replacement, the key cost drivers were inpatient hospital stay and outpatient attendances. Knee participants encountered higher use of physiotherapist services and day case visits. There were low levels of utilisation for 'another reason', with costs predominantly arising for occupational therapy visits and to a lesser extent for visiting a GP practice nurse.

Productivity loss
Absenteeism was estimated using the number of days missed from work. This was based on the reported return to work date. Costs were attached to the missed workdays, for the ten participants

who returned to work, to generate a mean cost per participant due to productivity loss over the period following surgery. This average cost (SD) of days missed from work was found to be £5,929 (£4,388) per participant; with a large degree of variability between participants in their productivity losses (range £455-£14,111). The mean cost was higher for knee replacement participants (£7,738, SD £4,521) than for hip replacement participants (£4,120, SD £3,833).

Health related quality of life

All participants completed the EQ-5D questions at baseline, with completion rates falling to 70% and 63% at 8 weeks, and 60% and 50% at 16 weeks, for hip and knee replacement participants respectively (*see Appendix 9, Section 6*). Mean utility scores and VAS scores increased over time for hip and knee replacement participants. The proportion of hip replacement participants who reported any problems decreased with time, from baseline to 16 weeks, for all five dimensions. For knee replacement participants, however, the proportion reporting problems increased at 16 weeks, for mobility and self-care, and remained the same as at 8 weeks for pain/discomfort.

Chapter 11: Discussion and Conclusion

11.1 Overview

The OPAL study was the first such research study to develop a tailored, occupational advice intervention to be delivered in the UK National Health Service to patients returning to work after hip and knee replacement surgery. The feasibility of delivering the developed intervention alongside usual care pathways was subsequently tested. The study methodology allowed the OPAL investigators to collect a wide variety of data and perspectives across a number of NHS sites. It provided pertinent information about the target population, delivery of usual care and explored outcomes of importance for this patient group, in keeping with the objectives defined at the beginning of the study (*see section 1.6*). In this section, the main findings of the study are summarised; discussed in the context of relevant published literature; and, based on the findings of the study, makes recommendations for further research.

11.2 Intervention mapping methodology

The intervention mapping approach proved complex and time-intensive, but did support the development of a clearly justified and structured intervention.

Several studies have reflected that intervention mapping (IM) is time and resource consuming[65, 68, 145, 146]. Wolfers *et al*[147] recommend a more flexible application of the method to make it more applicable in practice. Meng *et al*[148] employed a 'modified' approach to IM, using 'action plans' as 'a more practically feasible alternative to the matrices of change objectives' which have been highlighted as particularly time consuming by McEachen *et al*[146]. However, the main challenge reported when applying IM is the implementation of the action plans developed with this methodology.

OPAL experienced similar challenges with implementation (IM Stage 5), particularly in the context of a feasibility study (IM Stage 6). In stages 2- 4 the investigators developed the performance and change objectives, methods, applications and materials for delivering the occupational advice intervention within a hospital setting. However, in the context of a research setting, these were not always appropriate as there was overlap in the tasks related to 'intervention activity' (as laid out in the performance objectives) and 'research activity' (as required to fulfil ethical requirements). For example, in delivering the occupational advice intervention, the identification of return to work patients would have been the role of the outpatient clinic team, whereas in the feasibility study, this was undertaken by a research nurse. Other implementation issues included the complexity of training a range of staff in several different processes, within a short space of time, to deliver the intervention to a very small number of patients. These issues are discussed further in section 11.3.

In OPAL it became clear that the occupational advice intervention could only address outcomes based at the individual and interpersonal levels of the ecological model; it could not address outcomes based at organisational, community or societal levels. For example, it could not address NHS commissioning or primary care practice. It could not directly influence employer or workplace practice; however, it had the potential to indirectly make changes at these levels driven by changes in the individuals (employees) behaviour. In their systematic review, Fassier *et al*[62] concluded that IM is not a *magic panacea to prevent theory and/or implementation failures of work disability prevention interventions.* They have suggested that the limited number of effective interventions in work disability prevention indicate that IM needs to be adapted to reflect the complex interaction between healthcare and the workplace. They also recommend exploring the value of alternative

paradigms to the use of randomised controlled trials in the evaluation of interventions in this field, such as the theory-driven realist evaluation approach[149]. Given the complexity of the healthcare setting, as well as the complexity of the intervention, evaluation methods that are sensitive to the adaptation of interventions in different healthcare settings may be most appropriate[150, 151] , such as the use of dynamic logic models[152].

Given the complexity of the IM approach the study may have benefitted from a greater number of 'participatory planning group' meetings. At times the volume of information generated, particularly in IM stage 1, was overwhelming. Having three different teams based at different locations leading on complementary aspects of this stage (cohort study and survey: South Tees; evidence synthesis: York University; patient and stakeholder interviews and IM approach: University of Nottingham) added to the complexities of project management and facilitating greater communication between the research teams may have made the overall process easier.

11.3 Future research

Is a future clinical trial feasible?
The feasibility study demonstrated that it was possible to collect relevant data to answer the research question and that an economic analysis could be conducted alongside a future definitive trial. The OPAL study has defined and clarified the following key components for a future trial.

Population
Information collected about patients returning to work after hip and knee replacement, defined the target population for a future randomised control trial. The cohort study, structured interviews, evidence synthesis, Delphi consensus process and feasibility study provided information that allowed this population to be characterised, their needs assessed, and barriers and facilitators to return to work after surgery to be defined. The findings confirmed that this population had varied and complex needs, which supported the use of an individualised approach to managing their return to work. Information collected from key stakeholders (employers, surgeons, AHPs, nurses and GPs) generated a more complete picture of this patient group. These interviews demonstrated that healthcare teams and workplaces may not be prepared to, or understand how to, facilitate their patients/employees return to work after surgery. The information generated has supplemented the previous literature [20-49] to further define the target population which would benefit from an occupational advice intervention.

Intervention
An intervention was developed that addressed the key aspects of the commissioning brief, namely it was based in hospital, started prior to surgery, was individualised, provided target support, was proactive, and was designed in a pragmatic fashion to support delivery alongside routine care in an NHS setting. The intervention was designed using an iterative process using the IM approach[54-58] that allowed the OPAL investigators to revisit, revise and adapt the intervention as new information became available.

The intervention had a strong theoretical background and was underpinned by biopsychosocial models that supported behaviour change in the target groups (patients and stakeholders in the return to work process). It was manualised as a set of patient and staff performance objectives that defined its content, format, delivery and timing whilst maintaining pragmatism in the ability for participating sites to administer the intervention alongside standard care. Central to the intervention was the development of an interactive patient workbook that supported the self-directed development of a RTW plan, similar to other recently developed RTW interventions[153].

Implementation during the feasibility stage highlighted specific issues relating to the introduction of a complex intervention. The OPAL intervention was generally well received by patients and stakeholders: positive feedback was received throughout and the developed study materials were reported to be informative and helpful. There was good evidence from the completed patient workbooks that the intervention supported individualised care and, through the development of a return to work plan, acted as a decision aid[154-157] enabling shared decision making in line with best practice[158, 159] . The intervention also shared many of the characteristics of the occupational advice interventions identified in the rapid evidence synthesis including advice about job accommodation, mechanisms to support workplace visits and contact with the employer, education and advice, counselling and guidance through the RTWC, and involvement of the multidisciplinary team.

Furthermore, the OPAL intervention has similarities to another recently tested occupational advice intervention[153]. Grunfeld *et al* recently reported on the feasibility and acceptability of a theoretically led workbook intervention designed to support patients with cancer returning to work and confirmed the feasibility of undertaking a definitive trial in this setting.

There is some overlap between the content of the written materials developed within OPAL and those available through the Royal College of Surgeons of England (RSCEng) website (Example at https://www.rcseng.ac.uk/patients/recovering-from-surgery/total-hip-replacement/returning-to-work). The RCSEng provide generic written resources covering recovery after both hip and knee replacement. Within these are sections providing information about RTW and time lined guides for recovery after surgery. Because they are designed for all patients they do not provide the level of detail available within OPAL and cannot provide the individualised support our Phase 1 interviews suggests is needed. The structure, format and delivery of the OPAL intervention has been specifically designed to empower patients to take responsibility for their RTW and provides tools for them to develop an individualised RTW plan. It also encourages active engagement with employers and healthcare teams via the OPAL booklets and RTWC role.

Comparison

Usual care that would be the comparator in a future definitive trial was evaluated in the cohort study, patient and stakeholder interviews and survey of practice. This demonstrated a haphazard approach to the delivery of return to work information and significant variation in the way pre-operative services were configured. Most patients received little or no information about return to work from their hospital orthopaedic team or GP, and only a third of patients had access to occupational health support at work. These findings were counter to best practice as defined by NICE guideline 138[158] and NICE quality standard 15[159] (patient experience) which describe the need to ensure 'patients experience care that is tailored to their needs and personal preferences, taking into account their circumstances, their ability to access services and their coexisting conditions'. Many patients did not have workplace contact until they returned to work. Despite this, a significant proportion of patients felt current care was sufficient. This may reflect the fact they returned to work (if they returned to work this was seen as success) rather than any indication of the quality or timing of their return to work.

Outcome

The measurement of return to work is complex and the evidence synthesis demonstrated that there is currently no standardised method for recording it. Different approaches to measuring return to work were explored during the Delphi process and suggested a number of complimentary measures are needed. Dichotomous recording of work status is blunt and does not address important aspects of behaviour such as how patients return, use of phased and adapted returns, timing of return to work and secondary sickness absence. Measures such as the Workplace Limitation Questionnaire[125,

[141-143] and Readiness to Return to Work Scale[144] were assessed during the feasibility stage. They provided useful information about time lost at work and information about where patients felt they were in their return to work process.

Study delivery and design

Approximately a quarter of patients approached for the cohort and feasibility studies were eligible for inclusion and consent rates for eligible patients were greater than 80%. This suggests that there are substantial numbers of patients willing to participate in research examining return to work after hip and knee replacement. The response rates for the questionnaires, which reduced with extended follow up as participants returned to work, highlight a need to put additional efforts into improving the proportion of participants who return questionnaires.

The utility and resource use measures that were included in the questionnaires appear to have been appropriate for the purpose of collecting the health-related quality of life and cost data that fed into the economic analysis. The responses to such resource use and EQ-5D questions can be used to inform and improve the design of questionnaires in future research. For instance, participants reported that they had minimal or zero resource use for some items, which could be considered for removal from future questionnaires in order to reduce questionnaire completion burden for participants. Mean utility scores and EQ VAS scores increased over time, in line with what would be expected, which supports the face validity of using the EQ-5D measure.

Health care resource use was broadly similar for the cohort and feasibility participants, with common key cost drivers; the most notable cost difference was for knee replacement participants over the period of baseline to 8 weeks, where the costs associated with inpatient stay and day case visits were higher for cohort participants versus those in the feasibility study (who received the intervention). The cost associated with productivity loss following surgery was lower for the feasibility participants (£5,929 per feasibility participant versus £7,983 per cohort participant). This cost saving has the potential to offset the cost associated with the intervention and the difference in health care resource utilisation. It should be noted that, due to there being only a small number of participants in the feasibility element, and the feasibility and cohort groups not being randomised to facilitate meaningful comparisons, firm conclusions could not be drawn here. However, a definitive l trial would enable robust conclusions to be made regarding the cost-effectiveness of the RTW intervention.

The cost of training, which fed into the intervention cost (as part of the feasibility study), was based on the time spent by the RTWCs at the participating sites. It is acknowledged that this is a simplification of the costs involved, but due to the variation in training across the sites and additional data not being available, the RTWC time was the focus for the training cost. As part of a definitive trial, more detailed information could be collected in order to estimate the training cost more accurately.

Other research recommendations

There are a number of opportunities for further research. Further research to define the optimal method of implementing the OPAL intervention would be essential, before the intervention is formally tested in a randomised controlled trial (*see further discussion in section 11.4)*.

Additional research could focus on how the intervention might integrate with primary care. This could allow RTW planning to start earlier and may provide support to additional patients seeking to remain in work who have symptomatic osteoarthritis below the threshold requiring joint replacement. If proven to be effective in a definitive trial there is also the potential to investigate

how the OPAL intervention could be implemented in other elective orthopaedic surgery and other surgical specialities undertaking planned surgical procedures. A significant proportion of the developed intervention has transferable content and the needs assessment performed within OPAL is likely to be generalizable more widely to other specialties and settings, making this an important area for future research.

11.4 Strengths and limitations

IM stages 1 to 4

Due to our evidence synthesis following rapid review methodology, there was a restriction on the range of databases that were searched. However, our searches were undertaken by an experienced Information specialist in order to capture the most relevant databases, given this restriction. Preliminary results from the rapid evidence synthesis found only four papers for the elective surgery population. This finding was discussed with the Trial Steering Committee who advised including the musculoskeletal literature even though this included patients with a range of chronic musculoskeletal conditions, not representative of our target population. This approach yielded useful results that were applicable to our hip and knee replacement patients.

We were initially unable to set up the cohort study within the planned timescales in the three originally proposed sites. To mitigate issues posed by the delays, we opened an additional site that helped achieve our target recruitment and provided additional support during the feasibility study. Despite approaching all hip and knee replacement patients awaiting surgery at the study sites, we were only able to identify six patients intending to retire after surgery who were a group we intended to examine. As a consequence this part of the analysis was not performed. Interestingly 10% (n=9) of patients at the 8 week follow up stated that they no longer intended to return to work. It may be these patients that intended to retire after surgery but, for reasons that are unclear, did not state this during the baseline assessment.

The cohort study followed all patients until 16 weeks post-surgery and a subset for 24 weeks. Only 50% n=78 returned to work within the follow up period. Extended follow up studies have shown improvements in the observed rates of return to work[44, 45] , however, we were restricted by the study duration. Extended follow up would be useful as part of a larger trial as it could evaluate other complimentary aspects of return to work. These include evaluating return to work over time to understand whether it was sustained; periods of secondary sickness absence; whether patients returning to work on phased or adapted returns get back to full duties and the timeframe for this. The study participants only included a small number of black and minority ethnic patients. Their views and experiences were therefore not adequately represented within the cohort, patient interviews and feasibility testing and the findings of these elements may not be generalizable to these patient groups. Consideration needs to be given to how black and minority ethnic patient are represented within a future trial.

Follow up rates for the cohort study were 75% (n= 104) at 16 weeks and were lower at other time points. Similar issues with follow up and drop out were observed during the feasibility study. Once patients had returned to work, they disengaged with follow up procedures, instead seeming to focus on their work role. This may be a specific issue when conducting research on working patients who are possibly least likely to have time to participate in research and needs to be considered when designing a future study. We had initially hoped to use data to stratify patients into high and low risk of failed return to work as part of a tiered intervention. However, the failure to identify predictors, alongside the results from the Delphi consensus group and advice from the Trial Steering

Committee, led us to design an intervention for everyone. The advantage of this approach was that the intervention was available for all patients allowing engagement based on their individual need (described in *Chapter 9*).

The interviews demonstrated that current "usual care" was frequently not following best practice in relation to the use of workplace adjustments and partial return to work, and the use of the fit note to advise on this. This suggests there is room for improvement in how patients are supported in returning to work. Unfortunately we were only able to interview a small number of self-employed patients. This meant we were unable to provide a comprehensive commentary on the needs and behaviour of this group and to investigate whether they behave differently to those in other types of employment (lack of sick pay, pressure to get back to work sooner than employed patients, more options for workplace adaption and phased returns for employed people). Recruiting employers and GPs to interview was difficult. However, using a variety of strategies[160] we were able to achieve the recruitment required in IM stage 1, although we were unable to replicate this in the feasibility study. Whether or not interviews are conducted on a group or one-to-one basis is likely to change the dynamics of the interaction between researchers and participants. This may have influenced the nature of clinicians' contributions and the data collected, and may thus be a limitation of the study

Overall participation in the Delphi consensus process decreased from rounds 1 to 3. Attrition through the Delphi process is well recognised[139, 161], hence various strategies were employed which were known to enhance response rates[162, 163]. By round 3, fewer than 20% of our invited participants remained and employers and GPs were poorly represented in the final two rounds. Round 3 responses only included feedback from one employer and one GP. To mitigate the potential response bias introduced by a stakeholder group being not represented[164], an employer representative (UNISON) was approached who provided structured feedback on the intervention outside of the Delphi process. This information was used alongside the comments from other participants to finalise the intervention prior to feasibility testing.

IM stages 5-6

OPAL is a complex intervention that required considerable planning for its implementation and sufficient time to put in place the facilitators to embed it into practice and to remove potential barriers to its effectiveness[165]. Having developed the intervention using the IM framework, it was extremely challenging to effectively implement it within the timescale of the feasibility study. For it to be a successfully embedded at each site there was a need to involve all members of the hospital orthopaedic team. However, in reality, due to the limited time available for implementation and feasibility it was difficult to train all staff and implement the intervention as intended. Consequently, some staff had no training or did not receive the training as intended.

The feasibility study suggested that patient experience of the intervention was positive and there was high adherence with the patient performance objectives (POs). However, some of the staff POs showed lower adherence. This may reflect that data sources were unable to ascertain if these POs had taken place but also may reflect the challenges of incorporating new behaviours and procedures into current healthcare professional roles. It suggested that some of the implementation processes presented challenges and barriers to effective adoption. For future implementation and research studies these barriers to implementation could be viewed within the Consolidated Framework for Implementation Research[166] which could help with understanding and overcoming them.

Throughout OPAL, and particularly in the Delphi study, we found evidence of reluctance amongst healthcare professionals to take on the role of the provider of occupational advice, an 'anyone but

me' attitude. This reluctance suggests that sufficient time needs to be provided in order to change the attitudes, norms and behaviours necessary to embed the roles and responsibilities for occupational advice within the OPAL intervention. Disappointingly we were unable to interview GPs and therapy team members during the feasibility stage which might have provided greater detail about their attitudes toward the OPAL intervention and help to identify potential improvements. Time is also needed to prepare patient's expectations with respect to the provision of RTW advice as part of routine healthcare.

The RTWC role was not fulfilled in all settings in the way we had expected. It is a key role within the OPAL intervention, delivering or facilitating a number of the performance objectives. It would take a considerable time for someone to adapt and learn the competencies required for this role unless they had been recruited to specifically fulfil the required criteria for the role. There were contrasting experiences of the recruitment of the RTWCs. In one centre, there was uncertainty about whether funding was available to backfill posts meaning the local team found it difficult to predict how much time and resource would be required. By contrast, at another centre an experienced and enthusiastic senior nurse with a background in patient experience could be identified. Interviews suggested that some RTWCs accepted the role with reluctance. RTWCs were also required to be GCP trained because the role was in the context of a research study, causing delays in their appointment. The feasibility study, demonstrated some members of staff were not fully committed to the intervention. However, evidence from the feasibility interviews suggested that if the occupational advice intervention were to be an agreed and funded component of routine treatment, a greater level of acceptance and adherence to delivery would be expected.

During the feasibility study some of the trained staff rotated to other departments (junior doctors and AHPs) and others went on leave. This highlighted the need for on-going training if the intervention were to become embedded and sustained within a department. In addition some departments e.g. outpatients, were reluctant to take on additional duties as they were already 'over-stretched'.

The barriers described above relate to the 'Readiness for Implementations' within the inner settings constructs of the Consolidated Framework for Implementation Research[166] suggesting that increased commitment and engagement amongst staff needs to be ensured prior to implementation of the OPAL intervention. Given the timescales for implementation within the feasibility study, it is not surprising that the intervention was not fully embedded and that there were signs of a lack of commitment, resource issues, and lack of awareness in some teams. However, these are all factors about the inner setting for implementation that could be improved on for a larger trial or full adoption of the intervention within a service. There was also variation among patients in understanding and perception of the aims of the OPAL intervention, which suggests that the intervention may need to be presented more clearly. This links into the Consolidated Framework for Implementation Research[166] concept of intervention design quality and packaging and is an area for further consideration beyond the OPAL study.

In hindsight, it may have been beneficial to pause the project after IM stage 4 once the final intervention had been drafted. This would have allowed time to develop a more robust implementation strategy that provided the necessary training and support to deliver individual, organisational and cultural change within the local orthopaedic teams. However, this was not an option given the protocol and the need to make recommendations about the feasibility of a future clinical trial as per the original commissioning brief. Other studies have similarly reported difficulties applying IM stage 5. In a systematic review of interventions to prevent work disability developed

using an IM approach[62], reviewers were unable to report the IM stage 5 outcomes because they were insufficiently reported in the studies they reviewed.

It is important to consider how a future study would evaluate the cost-effectiveness of a RTW intervention, in terms of the study design and data collection considerations. The OPAL study found challenges around obtaining accurate cost information (e.g. cost of training) and achieving sufficient participant numbers which allow meaningful conclusions around the cost-effectiveness findings. Rather than the feasibility and cohort groups which were summarised here, a future definitive study should aim to randomise participants using a robust randomised controlled trial design to enable a full comparison to be made.

11.5 The final intervention

The feasibility study and Delphi Round 3 provided an opportunity for a patients and stakeholders to comment on the intervention. Based on this feedback, the intervention will be further refined and updated. However, this has not yet happened as the follow up for the feasibility study only closed on the 22nd March 2019.

In the developed intervention, all patient and staff POs were equally important. Further review of the intervention may reveal key core POs that are essential to delivery and could define the essence of OPAL with supplementary peripheral POs that could be more flexibly delivered. This approach may further support adoption and 'Scaling up' as teams have the ability to adapt the intervention so it is fit for purpose in their own clinical settings. This fits with the approach already taken not to be overly prescriptive about the intervention and to allow pragmatism in delivery.

Content and format issues have also been identified including the need to adapt the workbooks to include information for patients undergoing partial knee replacement procedures, requiring further detail on returning to driving and insurance after surgery, and further information for self-employed patients to make the workbooks more relevant for this group. The feasibility interview participants expressed some disappointment that their expectations around OPAL were not met/achieved or that they did not fully understand its purpose. This finding will also need to be addressed to provide clarity across the intervention and associated patient facing materials.

Currently a number of NHS patients are treated in the private sector. These patients are more likely to be younger, fitter and less likely to be obese [22, 23] and as such a greater proportion of patients than observed in this study could be expected to be working at the time of surgery. Furthermore, they often do not have to wait as long for surgery. While it would have been beneficial to assess this patient group it was not possible because of the challenges performing research in the private sector due to a lack of research infrastructure and research delivery support. We could not establish whether the needs or behaviours of this patient group differ from the observed NHS cohort. However, the OPAL intervention was designed to support delivery across a range of NHS settings and it is sympathetic to the variations in practice inherent within the NHS. Therefore we feel confident that it should be possible to translate the intervention to patients having surgery in the private sector once its effectiveness has been established with further research.

11.6 Conclusions

OPAL had two key objectives to 1) develop a multidisciplinary occupational advice intervention for working adults undergoing primary, elective, hip and knee replacement and 2) assess the delivery of the intervention and make recommendations about its further evaluation within a clinical trial. Both

of these objectives were met. An intervention mapping (IM) approach was used to develop the RTW intervention and a series of methodologies were employed to underpin the development of the intervention and to tests its feasibility clinically.

The OPAL intervention developed is an individualised return to work plan that is tailored to patients' needs and involves them in decisions about their care, which supports best practice[158, 159]. It was feasible to deliver the OPAL intervention with high levels of fidelity within current NHS care settings although further preparatory research on implementation is still required. The effectiveness and cost-effectiveness of the OPAL intervention then needs to be formally tested in a definitive multi-centre pragmatic randomised controlled trial. Further research is warranted given the fact that there are currently between 40,000 to 50,000 patients that might be eligible for a return to work intervention every year in the UK[18, 167] who could potentially benefit from the OPAL intervention.

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Data sharing statement

All data requests should be submitted to the corresponding author for consideration. Access to anonymised data may be granted following review.

Contributions of authors

- Paul Baker: Contributed to the conception, design and delivery of the overall project. Supervised the project as chief investigator and had specific responsibility for the cohort study, survey of practice, intervention development and feasibility study. Drafted the report.
- Carol Coole: Contributed to the conception, design and delivery of the overall project. Led the intervention mapping process and on the collection and analysis of qualitative data throughout the study. Drafted the report.
- Avril Drummond: Contributed to the conception, design and delivery of the overall project. Had specific responsibility for the patient and stakeholder interviews and Delphi consensus process. Commented on drafts of the report.
- Sayeed Khan: Contributed to the conception, design and delivery of the overall project. Had specific responsibility for employer engagement. Commented on drafts of the report.
- Catriona McDaid: Contributed to the conception, design and delivery of the overall project. Supervised the rapid evidence synthesis. Commented on drafts of the report.
- Catherine Hewitt: Contributed to the conception, design and delivery of the overall project. Supervised the statistical analysis of the cohort study and feasibility study. Commented on drafts of the report.
- Lucksy Kottam: Contributed to the design and delivery of the overall project. Supervised all ethics requests and PPI engagement. Contributed to the cohort study, Delphi consensus process, survey of practice, intervention development and feasibility study. Drafted the report.
- Sarah Ronaldson: Contributed to the design and delivery of the overall project. Performed the health economic evaluation, rapid evidence synthesis and contributed to the statistical analyses for the cohort study. Drafted the report.
- Elizabeth Coleman: Contributed to the delivery of the overall project. Performed the statistical analyses for the cohort study and feasibility study. Drafted the report.
- David McDonald: Contributed to the design and delivery of the overall project. Contributed to the cohort study, survey of practice and feasibility study. Commented on drafts of the report.
- Fiona Nouri: Contributed to the delivery of the overall project. Contributed to intervention mapping process and the collection and analysis of qualitative data throughout the study. Commented on drafts of the report.
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- Gerry Richardson: Contributed to the design and delivery of the overall project. Supervised the health economic evaluation. Commented on drafts of the report.
- Amar Rangan: Contributed to the conception, design and delivery of the overall project. Supervised the Delphi consensus process and contributed to the intervention development. Drafted the report.

Publications

Baker P, Coole C, Drummond A, McDaid C, Khan S, Thomson L, Hewitt C, McNamara I, McDonald D, Fitch J, Rangan A. Protocol paper: Occupational advice for Patients undergoing Arthroplasty of the Lower limb (OPAL). BMC Health Services Research 2018 18:504[140]

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Appendices and table legends

Appendix 1: Protocol version history

- **Section 1: Protocol version history**

Appendix 2: Supporting information for the rapid evidence synthesis (IM stage 1)

- **Section 1: Search strategies for the rapid evidence synthesis**
- **Section 2: Data extraction form templates**
- **Section 3: List of the 50 full text systematic reviews screened for eligibility**
  - Table 23: Excluded systematic reviews (from full paper screening)
- **Section 4: Details of the 17 included systematic reviews**
  - Table 24: Key details of the included systematic reviews
  - Table 25: Methodological quality summary of systematic reviews using AMSTAR
- **Section 5: Summary of relevant studies from included reviews, for work-related outcomes**
  - Table 26: Summary of relevant studies from the included reviews, regarding work-related outcomes
- **Section 6: Interventions with evidence of benefit from relevant studies (included systematic reviews)**
  - Table 27: Details of interventions with evidence of benefit featured in relevant studies from the included systematic reviews
- **Section 7: Outcome measures in relevant studies from the systematic reviews**
  - Table 28: Outcome measures used in relevant studies from the systematic reviews
- **Section 8: List of the 140 full text primary studies screened for eligibility**
  - Table 29: Excluded primary studies (from full paper screening)
- **Section 9: Details of the 4 included primary studies**
  - Table 30: Study characteristics of the included primary studies
  - Table 31: Methodological quality summary of qualitative studies using CASP tool
  - Table 32: Methodological quality summary for quantitative studies using Cochrane Collaboration's tool
- **Section 10: Intervention characteristics of the included primary studies**
  - Table 33: Intervention characteristics of the included primary studies of surgical populations
- **Section 11: Data extraction for qualitative studies**

Appendix 3: Supporting information for the cohort study, health economic analysis and national survey of practice (IM stage 1)

- **Section 1: Patient information sheet for OPAL cohort study**
- **Section 2: Supplementary information for cohort study analyses**
  - Table 34: List of jobs given by participants in the cohort study, 145 responses
  - Table 35: Baseline health measures (PHQ-9, GAD-2, OH/KS and BRS) for the cohort, detailed by operation type and overall
  - Table 36: Details on the cohort participants' work habits pre-surgery, by type of operation and overall information provided at baseline
  - Table 37: Work Design Questionnaire at baseline for the cohort study, details given for each answer and overall average score, given for each arm and overall information provided at baseline

- Table 38: Advice given and expectations before the operation, for each operation type and overall for the cohort participants
- Table 39: Oxford Hip & Knee Score in categorised form and descriptively for the cohort study at each time point, both by type of operation, and overall
- Table 40: Details on the Cohort returnee's first weeks back at work; data combined across the time-points
- Table 41: Use of fit notes and returning to activities for each operation type, and overall, at each follow-up time point
- Table 42: Workplace Limitations Questionnaire results for each question, and percentage of time lot, for each time point, by operation type and overall
- Table 43: Significance of factors tested for prediction of return to work for the cohort participants

➢ **Section 3: Supplementary information for health economic analyses**
- Table 44: Unit costs of resource use
- Table 45: Mean resource use, based on all available cases (in relation to 'another reason')
- Table 46: Summary of costs accrued at 8 weeks and 16 weeks (in relation to another reason)
- Table 47: Mean (SD) resource use up to 16 weeks follow-up for complete cases (in relation to your joint replacement)
- Table 48: Mean (SD) resource use up to 16 weeks follow-up for complete cases (in relation to 'another reason')
- Table 49: Summary of costs to 16 week follow up for complete cases (in relation to your joint replacement)
- Table 50: Summary of costs to 16 week follow up for complete cases (in relation to 'another reason')
- Table 51: Summary of EQ-5D utility scores at each time point (all available cases)
- Table 52: Summary of EQ-VAS scores at each time point (all available cases)
- Table 53: EQ-5D questionnaire return rates and missing data
- Table 54: Number of missing dimensions for invalid EQ-5D questionnaires
- Table 55: Proportion reporting EQ-5D-5L levels 1 to 5 by dimension and time point for *hip* replacement patients
- Table 56: Proportion reporting EQ-5D-5L levels 1 to 5 by dimension and time point for *knee* replacement patients

➢ **Section 4: Supplementary information for the survey of practice**
- Table 57: Survey responses for hospital orthopaedic team members
- Table 58: Example quotations from various interviewees from the survey of practice

Appendix 4: Supporting information for the patient interviews (IM Stage 1)

➢ **Section 1: Interview schedules**
- Table 59: Patient interview schedule

➢ **Section 2: Characteristics of patient interviewees**
- Table 60: Occupations of the patient participants

➢ **Section 3: Patient interview quotations**

Appendix 5: Supporting information for the stakeholder interviews (IM Stage 1)

➢ **Section 1: Stakeholder interview schedules**
- Table 61: Workplace representative interview schedule
- Table 62: Surgeon interview schedule

- Table 63: GP interview schedule
- Table 64: AHP/Nurse interview schedule

➢ **Section 2: Characteristics of interviewees**
- Table 65: Characteristics of employer participants
- Table 66. Characteristics of surgeon participants (*36 month practice profile 01/04/12 to 31/03/17 (NJR))
- Table 66. Characteristics of GP participants (*Indices of Multiple Deprivation (1- 10 where 1 = most deprived))
- Table 67. Characteristics of AHP/Nurse participants (*sites referred to by letter to maintain anonymity)

➢ **Section 3: Interview quotations**

Appendix 6: Supporting information for IM stages 2 and 3

➢ **Section 1: Change objectives for each of the performance objectives in the final OPAL intervention**
➢ **Section 2: Patient methods and applications**
➢ **Section 3: Staff methods and applications**

Appendix 7: Supporting information for the Delphi consensus process

➢ **Section 1: Delphi consensus participants**
➢ **Section 2: Delphi Round 1**
- Table 68: Details of stakeholders invited to participate in the Delphi consensus process
- Table 69: Responses to Section 1 of Round 1 Delphi
- Table 70: Responses to Section 1 of Round 1 Delphi ordered based on consensus (% respondents answering strongly agree or agree), second level based on % of strongly agree respondents
- Table 71: Statements for Section 1 of Round 1 Delphi ordered based on consensus (% respondents answering strongly agree or agree), second level based on % of strongly agree respondents
- Table 72: Sub-analysis and actions for 6 statements that failed to reached overall consensus from section 1 of Round 1 of Delphi
- Table 73: Additional 'Free comments' from Section 1 of Round 1 Delphi
- Table 74: Responses to Section 2 of Round 1 Delphi (IMPORTANT OUTCOME)
- Table 75: Responses to Section 2 of Round 1 Delphi (DELIVERABLE OUTCOME)
- Table 76: Summary of agreement for both importance and deliverable outcome in Section 2 of Round 1 Delphi ordered based on level of consensus: first level % respondents answering strongly agree or agree to IMPORTANT question; second level based on % respondents answering strongly agree or agree to DELIVERABLE question
- Table 77: Statements for Section 2 of Round 1 Delphi group according to whether consensus was reached for both IMPORTANT AND DELIVERABLE outcome; one of the outcomes or none of the outcomes. With groups statements are ordered based on level of consensus: first level % respondents answering strongly agree or agree to IMPORTANT question; second level based on % respondents answering strongly agree or agree to DELIVERABLE question
- Table 78: Sub-analysis and actions for 16 statements that failed to reach overall consensus from section 2 of Round 1 of Delphi
- Table 79: Additional 'Free comments' from Section 2 of Round 1 Delphi

➢ **Section 3: Delphi Round 2**

- Table 80: Responses for Round 1 statements represented to the Delphi members in Round 2 (questionnaire Section 1)
- Table 81: Responses for 'new' Round 2 statements (questionnaire Section 2)
- Table 82: Additional 'Free comments' from Delphi Round 2

➢ **Section 4: Delphi Round 3**
- Table 83: Round 3 Delphi responses

Appendix 8: OPAL study roles and responsibilities for hospital orthopaedic team members

➢ **Section 1: Roles and responsibilities**

Appendix 9: Supporting information for the implementation and feasibility assessment

➢ **Section 1: Training logs for each of the OPAL feasibility sites**
➢ **Section 2: Lists of training materials created to supplement OPAL implementation**
➢ **Section 3: Checklist for intervention fidelity against performance objectives**
- Table 84: Checklist to determine whether patient performance objectives had been achieved
- Table 85: Checklist to determine whether staff performance objectives had been achieved

➢ **Section 4: Feasibility Patient interviews**
➢ **Section 5: Assessment of intervention effectiveness**
- Table 86: Participant Characteristics for the feasibility phase
- Table 87: Details on the activities relating to participants' jobs in the feasibility phase
- Table 88: Involvement of participants with the OPAL intervention in the feasibility phase
- Table 89: The General Self-Efficacy Scale
- Table 90: Time to return to work post-surgery for the participants in the feasibility phase
- Table 91: Details of the participants return to work in the feasibility phase – combined over time points
- Table 92: Details of the participants fit note use in the feasibility phase, by time point
- Table 93: Readiness to return to work scale for the feasibility phase, each response is scored 1 (strongly disagree) to 5 (strongly agree), and responses have been grouped into agreement, neutral and disagreement with each statement
- Table 94: Returned Questionnaires for participants in the feasibility phase
- Table 95: Workplace participation questionnaire data for the feasibility participants at each time point
- Table 96: Mean resource use, based on all available cases (in relation to your joint replacement)
- Table 97: Mean resource use, based on all available cases (in relation to 'another reason')
- Table 98: Mean (SD) resource use up to 16 weeks follow-up for complete cases (in relation to your joint replacement)
- Table 99: Mean (SD) resource use up to 16 weeks follow-up for complete cases (in relation to 'another reason')
- Table 100: Summary of costs accrued at 8 weeks and 16 weeks (in relation to your joint replacement)
- Table 101: Summary of costs accrued at 8 weeks and 16 weeks (in relation to another reason)
- Table 102: Summary of costs to 16 week follow up for complete cases (in relation to your joint replacement)
- Table 103: Summary of costs to 16 week follow up for complete cases (in relation to 'another reason')

- Table 104: EQ-5D questionnaire return rates and missing data
- Table 105: Number of missing dimensions for invalid EQ-5D questionnaires
- Table 106: Summary of EQ-5D utility scores at each time point (all available cases)
- Table 107: Summary of EQ-VAS scores at each time point (all available cases)
- Table 108: Proportion reporting EQ-5D-5L levels 1 to 5 by dimension and time point for *hip* replacement patients
- Table 109: Proportion reporting EQ-5D-5L levels 1 to 5 by dimension and time point for *knee* replacement patients

Appendix 1: Protocol version history

Section 1: Protocol version history

Version	Date	Comments
1.0	1st July 2016	Project commenced with version 1.0
2.0	8th August 2016	Minor changes to the protocol prior to final ethics submission. HRA approval issued on 04 Oct 2016 (06 Oct 2016 reissued) – See ethics approvals and HRA correspondence documents
3.0	4th November 2016	Study protocol amendment relates to inclusion of nurses (involved in the care of the hip /knee replacement patient group) to be interviewed as part of the AHP (Allied health Professional) group stakeholder interviews. Amendment No./ Sponsor Ref: NSA #2 - minor changes to Protocol Amendment Date: 31/01/2017 Amendment Type: Non-substantial
4.0	4th April 2018	Protocol updated to include information relating to the Delphi process, adoption and implementation plans and feasibility testing. Change made to facilitate resubmission to HRA for approval of notified amendment prior to commencing patient recruitment for the feasibility element of the study (cohort 2). Amendment No./Sponsor Ref: 3 Amendment Date: 26 April 2018 Amendment Type: Substantial Non-CTIMP

Appendix 2: Supporting information for the rapid evidence synthesis (IM stage 1)

Section 1: Search strategies for the rapid evidence synthesis

Search strategies for systematic reviews

Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Ovid MEDLINE(R) Daily and Ovid MEDLINE(R) <1946 to Present>

1 return to work/ (1009)
2 (return* adj2 (work* or employment)).tw. (9320)
3 (resum* adj2 (work* or employment)).tw. (885)
4 (back adj2 (work* or employment)).tw. (1474)
5 ((back or return* or resum*) adj2 usual activit*).tw. (129)
6 ((back or return* or resum*) adj2 normal activit*).tw. (2039)
7 (work or workplace* or worksite*).ti. (85708)
8 Occupational Therapy/ (11378)
9 Activities of Daily Living/ (55286)
10 8 and 9 (1285)
11 (occupational adj2 (therapy or intervention$ or advice or information or guidance)).ti,ab. (8732)
12 (usual activit$ or daily activit$ or everyday activit$ or normal activit$).ti,ab. (20849)
13 (everyday life or daily life).ti,ab. (18856)
14 ((social or community or family) adj2 participat$).ti,ab. (10319)
15 12 or 13 or 14 (49033)
16 11 and 15 (325)
17 1 or 2 or 3 or 4 or 5 or 6 or 7 or 10 or 16 (97766)
18 MEDLINE.tw. (79537)
19 systematic review.tw. (78220)
20 meta analysis.pt. (70890)
21 18 or 19 or 20 (169057)
22 17 and 21 (1452)
23 limit 22 to (english language and yr="2015 -Current") (229)
24 (systematic$ adj2 review$).ti,ab. (95694)
25 meta-analysis as topic/ (15169)
26 meta-analytic$.ti,ab. (4933)
27 meta-analysis.ti,ab,pt. (106298)
28 metanalysis.ti,ab. (148)
29 metaanalysis.ti,ab. (1321)
30 meta analysis.ti,ab. (84187)
31 meta-synthesis.ti,ab. (413)
32 metasynthesis.ti,ab. (194)
33 meta synthesis.ti,ab. (413)
34 meta-regression.ti,ab. (4024)
35 metaregression.ti,ab. (414)
36 meta regression.ti,ab. (4024)
37 (synthes$ adj3 literature).ti,ab. (1971)
38 (synthes$ adj3 evidence).ti,ab. (5745)
39 integrative review.ti,ab. (1434)
40 data synthesis.ti,ab. (8609)
41 (research synthesis or narrative synthesis).ti,ab. (1353)

42 (systematic study or systematic studies).ti,ab. (9268)
43 (systematic comparison$ or systematic overview$).ti,ab. (2428)
44 evidence based review.ti,ab. (1602)
45 comprehensive review.ti,ab. (9430)
46 critical review.ti,ab. (12776)
47 quantitative review.ti,ab. (558)
48 structured review.ti,ab. (601)
49 realist review.ti,ab. (130)
50 realist synthesis.ti,ab. (101)
51 pooled analysis.ti,ab. (5483)
52 or/24-51 (224199)
53 review.pt. (2160213)
54 medline.ab. (79144)
55 pubmed.ab. (56121)
56 cochrane.ab. (49164)
57 embase.ab. (49803)
58 cinahl.ab. (16302)
59 psyc?lit.ab. (904)
60 psyc?info.ab. (13963)
61 (literature adj3 search$).ab. (37155)
62 (database$ adj3 search$).ab. (35979)
63 (bibliographic adj3 search$).ab. (1686)
64 (electronic adj3 search$).ab. (13608)
65 (electronic adj3 database$).ab. (16767)
66 (computeri?ed adj3 search$).ab. (3066)
67 (internet adj3 search$).ab. (2284)
68 included studies.ab. (12720)
69 (inclusion adj3 studies).ab. (10033)
70 inclusion criteria.ab. (52316)
71 selection criteria.ab. (27264)
72 predefined criteria.ab. (1415)
73 predetermined criteria.ab. (846)
74 (assess$ adj3 (quality or validity)).ab. (54589)
75 (select$ adj3 (study or studies)).ab. (48320)
76 (data adj3 extract$).ab. (41727)
77 extracted data.ab. (10773)
78 (data adj2 abstracted).ab. (4065)
79 (data adj3 abstraction).ab. (1159)
80 published intervention$.ab. (137)
81 ((study or studies) adj2 evaluat$).ab. (134076)
82 (intervention$ adj2 evaluat$).ab. (7948)
83 confidence interval$.ab. (293086)
84 heterogeneity.ab. (117958)
85 pooled.ab. (60403)
86 pooling.ab. (9358)
87 odds ratio$.ab. (192922)
88 (Jadad or coding).ab. (143477)
89 or/54-88 (1028147)
90 53 and 89 (163451)
91 review.ti. (329001)

92 91 and 89 (74527)
93 (review$ adj4 (papers or trials or studies or evidence or intervention$ or evaluation$)).ti,ab. (133651)
94 52 or 90 or 92 or 93 (389132)
95 letter.pt. (932159)
96 editorial.pt. (412140)
97 comment.pt. (677186)
98 95 or 96 or 97 (1513065)
99 94 not 98 (379528)
100 exp animals/ not humans/ (4276691)
101 99 not 100 (368838)
102 17 and 101 (2468)
103 limit 102 to (english language and yr="2015 -Current") (366)
104 23 or 103 (375)

Embase <1974 to 2016 Week 28>
1 work resumption/ or return to work/ (5861)
2 ((back or return* or resum*) adj2 normal activit*).tw. (2669)
3 ((back or return* or resum*) adj2 usual activit*).tw. (164)
4 ((back or return* or resum*) adj2 (work* or employment)).tw. (13816)
5 (work or workplace* or worksite*).ti. (93856)
6 Occupational Therapy/ (19333)
7 daily life activity/ (65541)
8 6 and 7 (2054)
9 (occupational adj2 (therapy or intervention$ or advice or information or guidance)).ti,ab. (12270)
10 (usual activit$ or daily activit$ or everyday activit$ or normal activit$).ti,ab. (28784)
11 (everyday life or daily life).ti,ab. (25739)
12 ((social or community or family) adj2 participat$).ti,ab. (11513)
13 10 or 11 or 12 (64544)
14 9 and 13 (529)
15 1 or 2 or 3 or 4 or 5 or 8 or 14 (111455)
16 systematic$ review$.ti,ab. (106926)
17 systematic$ literature review$.ti,ab. (7748)
18 "systematic review"/ (109866)
19 "systematic review (topic)"/ (16007)
20 meta analysis/ (111622)
21 "meta analysis (topic)"/ (27698)
22 meta-analytic$.ti,ab. (5491)
23 meta-analysis.ti,ab. (103470)
24 metanalysis.ti,ab. (367)
25 metaanalysis.ti,ab. (4993)
26 meta analysis.ti,ab. (103470)
27 meta-synthesis.ti,ab. (378)
28 metasynthesis.ti,ab. (182)
29 meta synthesis.ti,ab. (378)
30 meta-regression.ti,ab. (4754)
31 metaregression.ti,ab. (642)
32 meta regression.ti,ab. (4754)
33 (synthes$ adj3 literature).ti,ab. (2196)

34 (synthes$ adj3 evidence).ti,ab. (6216)
35 (synthes$ adj2 qualitative).ti,ab. (1079)
36 integrative review.ti,ab. (1173)
37 data synthesis.ti,ab. (10472)
38 (research synthesis or narrative synthesis).ti,ab. (1275)
39 (systematic study or systematic studies).ti,ab. (9972)
40 (systematic comparison$ or systematic overview$).ti,ab. (2576)
41 (systematic adj2 search$).ti,ab. (16572)
42 systematic$ literature research$.ti,ab. (189)
43 (review adj3 scientific literature).ti,ab. (1268)
44 (literature review adj2 side effect$).ti,ab. (12)
45 (literature review adj2 adverse effect$).ti,ab. (2)
46 (literature review adj2 adverse event$).ti,ab. (11)
47 (evidence-based adj2 review).ti,ab. (2732)
48 comprehensive review.ti,ab. (10628)
49 critical review.ti,ab. (14174)
50 critical analysis.ti,ab. (7020)
51 quantitative review.ti,ab. (617)
52 structured review.ti,ab. (752)
53 realist review.ti,ab. (119)
54 realist synthesis.ti,ab. (75)
55 (pooled adj2 analysis).ti,ab. (11998)
56 (pooled data adj6 (studies or trials)).ti,ab. (1896)
57 (medline and (inclusion adj3 criteria)).ti,ab. (15165)
58 (search adj (strateg$ or term$)).ti,ab. (24858)
59 or/16-58 (341191)
60 medline.ab. (89743)
61 pubmed.ab. (68036)
62 cochrane.ab. (55437)
63 embase.ab. (56000)
64 cinahl.ab. (16308)
65 psyc?lit.ab. (965)
66 psyc?info.ab. (12865)
67 lilacs.ab. (4553)
68 (literature adj3 search$).ab. (44951)
69 (database$ adj3 search$).ab. (42042)
70 (bibliographic adj3 search$).ab. (1882)
71 (electronic adj3 search$).ab. (14783)
72 (electronic adj3 database$).ab. (20773)
73 (computeri?ed adj3 search$).ab. (3486)
74 (internet adj3 search$).ab. (2935)
75 included studies.ab. (13776)
76 (inclusion adj3 studies).ab. (11147)
77 inclusion criteria.ab. (82127)
78 selection criteria.ab. (25286)
79 predefined criteria.ab. (1833)
80 predetermined criteria.ab. (1026)
81 (assess$ adj3 (quality or validity)).ab. (67482)
82 (select$ adj3 (study or studies)).ab. (60109)
83 (data adj3 extract$).ab. (50271)

84 extracted data.ab. (10865)
85 (data adj2 abstracted).ab. (6110)
86 (data adj3 abstraction).ab. (1567)
87 published intervention$.ab. (155)
88 ((study or studies) adj2 evaluat$).ab. (180324)
89 (intervention$ adj2 evaluat$).ab. (10236)
90 confidence interval$.ab. (326652)
91 heterogeneity.ab. (139933)
92 pooled.ab. (78503)
93 pooling.ab. (11574)
94 odds ratio$.ab. (226153)
95 (Jadad or coding).ab. (159476)
96 evidence-based.ti,ab. (94548)
97 or/60-96 (1337619)
98 review.pt. (2180899)
99 97 and 98 (164450)
100 review.ti. (376276)
101 97 and 100 (88520)
102 (review$ adj10 (papers or trials or trial data or studies or evidence or intervention$ or evaluation$ or outcome$ or findings)).ti,ab. (372964)
103 (retriev$ adj10 (papers or trials or studies or evidence or intervention$ or evaluation$ or outcome$ or findings)).ti,ab. (18949)
104 59 or 99 or 101 or 102 or 103 (693905)
105 letter.pt. (946723)
106 editorial.pt. (513729)
107 105 or 106 (1460452)
108 104 not 107 (680968)
109 (animal/ or nonhuman/) not exp human/ (5063625)
110 108 not 109 (654903)
111 "cochrane database of systematic reviews$".jn. (11204)
112 110 not 111 (644891)
113 conference abstract.pt. (2296758)
114 112 not 113 (561003)
115 15 and 114 (3328)
116 limit 115 to (english language and yr="2015 -Current") (317)

Cochrane Database of Systematic Reviews (CSDR) and DARE

#1 MeSH descriptor: [Return to Work] explode all trees
#2 (return* near/2 (work* or employment)):ti,ab,kw (Word variations have been searched)
#3 (resum* near/2 (work* or employment)):ti,ab,kw (Word variations have been searched)
#4 (back* near/2 (work* or employment)):ti,ab,kw (Word variations have been searched)
#5 ((back or return* or resum*) near/2 usual activit*):ti,ab,kw (Word variations have been searched)
#6 ((back or return* or resum*) near/2 normal activit*):ti,ab,kw (Word variations have been searched)
#7 (work or workplace* or worksite*):ti (Word variations have been searched)
#8 MeSH descriptor: [Occupational Therapy] explode all trees
#9 MeSH descriptor: [Activities of Daily Living] this term only
#10 #8 and #9

#11 (occupational near/2 (therapy or intervention* or advice or information or guidance)):ti,ab,kw (Word variations have been searched)
#12 (usual activit* or daily activit* or everyday activit* or normal activit*):ti,ab,kw (Word variations have been searched)
#13 (everyday life or daily life):ti,ab,kw (Word variations have been searched)
#14 ((social or community or family) near/2 participat*):ti,ab,kw (Word variations have been searched)
#15 #12 or #13 or #14
#16 #11 and #15
#17 #1 or #2 or #3 or #4 or #5 or #6 or #7 or #10 or #16

Search strategies for primary studies

CINAHL via EBSCO, search date of 19th August 2016, 484 records identified

S1 (MH "Surgery, Operative+") (426,382)
S2 elective N2 surgery OR elective N2 surgical OR plan* N2 surgery OR plan* N2 surgical (6,896)
S3 S1 OR S2 (428,083)
S4 (MH "Occupational Therapy+") OR (MH "Occupational Therapy Practice, Research-Based") OR (MH "Occupational Therapy Practice, Evidence-Based") OR (MH "Occupational Therapy Assessment") OR (MH "Occupational Therapy Service") OR (MH "Occupational Therapy Practice") OR (MH "Home Occupational Therapy") (21,853)
S5 occupational N3 (advice or advis* or guidance or information or intervention* or therap*) (33,360)
S6 S4 OR S5 (34,139)
S7 S3 AND S6 (551)
S8 S3 AND S6 – English (543)
S9 S3 AND S6 - Published Date: 19960101-20161231 (484)

Cochrane Central Register of Controlled Trials (CENTRAL)
Via John Wiley's Cochrane Library, search date of 23rd August 2016, 24 records identified

#1 MeSH descriptor: [Specialties, Surgical] explode all trees
#2 MeSH descriptor: [Colorectal Surgery] this term only
#3 MeSH descriptor: [General Surgery] explode all trees
#4 MeSH descriptor: [Gynecology] this term only
#5 MeSH descriptor: [Neurosurgery] this term only
#6 MeSH descriptor: [Obstetrics] this term only
#7 MeSH descriptor: [Ophthalmology] this term only
#8 MeSH descriptor: [Orthognathic Surgery] explode all trees
#9 MeSH descriptor: [Orthopedics] this term only
#10 MeSH descriptor: [Otolaryngology] this term only
#11 MeSH descriptor: [Surgery, Plastic] this term only
#12 MeSH descriptor: [Thoracic Surgery] this term only
#13 MeSH descriptor: [Traumatology] this term only
#14 MeSH descriptor: [Urology] this term only
#15 MeSH descriptor: [Sports Medicine] this term only
#16 MeSH descriptor: [Surgical Procedures, Operative] explode all trees
#17 MeSH descriptor: [Ablation Techniques] explode all trees
#18 MeSH descriptor: [Ambulatory Surgical Procedures] explode all trees
#19 MeSH descriptor: [Anastomosis, Surgical] explode all trees
#20 MeSH descriptor: [Assisted Circulation] explode all trees
#21 MeSH descriptor: [Bariatric Surgery] explode all trees
#22 MeSH descriptor: [Biopsy] explode all trees
#23 MeSH descriptor: [Bloodless Medical and Surgical Procedures] explode all trees
#24 MeSH descriptor: [Body Modification, Non-Therapeutic] explode all trees
#25 MeSH descriptor: [Cardiovascular Surgical Procedures] explode all trees
#26 MeSH descriptor: [Curettage] explode all trees
#27 MeSH descriptor: [Cytoreduction Surgical Procedures] explode all trees
#28 MeSH descriptor: [Debridement] explode all trees
#29 MeSH descriptor: [Decompression, Surgical] explode all trees

#30 MeSH descriptor: [Deep Brain Stimulation] explode all trees
#31 MeSH descriptor: [Device Removal] explode all trees
#32 MeSH descriptor: [Digestive System Surgical Procedures] explode all trees
#33 MeSH descriptor: [Dissection] explode all trees
#34 MeSH descriptor: [Drainage] explode all trees
#35 MeSH descriptor: [Elective Surgical Procedures] explode all trees
#36 MeSH descriptor: [Electrosurgery] explode all trees
#37 MeSH descriptor: [Endocrine Surgical Procedures] explode all trees
#38 MeSH descriptor: [Extracorporeal Circulation] explode all trees
#39 MeSH descriptor: [Hemostasis, Surgical] explode all trees
#40 MeSH descriptor: [Laparotomy] explode all trees
#41 MeSH descriptor: [Ligation] explode all trees
#42 MeSH descriptor: [Lymph Node Excision] explode all trees
#43 MeSH descriptor: [Mastectomy] explode all trees
#44 MeSH descriptor: [Metastasectomy] explode all trees
#45 MeSH descriptor: [Microsurgery] explode all trees
#46 MeSH descriptor: [Minimally Invasive Surgical Procedures] explode all trees
#47 MeSH descriptor: [Minor Surgical Procedures] explode all trees
#48 MeSH descriptor: [Monitoring, Intraoperative] explode all trees
#49 MeSH descriptor: [Obstetric Surgical Procedures] explode all trees
#50 MeSH descriptor: [Neurosurgical Procedures] explode all trees
#51 MeSH descriptor: [Ophthalmologic Surgical Procedures] explode all trees
#52 MeSH descriptor: [Filtering Surgery] explode all trees
#53 MeSH descriptor: [Light Coagulation] explode all trees
#54 MeSH descriptor: [Refractive Surgical Procedures] explode all trees
#55 MeSH descriptor: [Oral Surgical Procedures] explode all trees
#56 MeSH descriptor: [Orthopedic Procedures] explode all trees
#57 MeSH descriptor: [Ostomy] explode all trees
#58 MeSH descriptor: [Otorhinolaryngologic Surgical Procedures] explode all trees
#59 MeSH descriptor: [Pelvic Exenteration] explode all trees
#60 MeSH descriptor: [Perioperative Care] explode all trees
#61 MeSH descriptor: [Perioperative Period] explode all trees
#62 MeSH descriptor: [Prophylactic Surgical Procedures] explode all trees
#63 MeSH descriptor: [Prosthesis Implantation] explode all trees
#64 MeSH descriptor: [Punctures] explode all trees
#65 MeSH descriptor: [Reconstructive Surgical Procedures] explode all trees
#66 MeSH descriptor: [Reoperation] explode all trees
#67 MeSH descriptor: [Second-Look Surgery] explode all trees
#68 MeSH descriptor: [Splenectomy] explode all trees
#69 MeSH descriptor: [Surgery, Computer-Assisted] explode all trees
#70 MeSH descriptor: [Symphysiotomy] explode all trees
#71 MeSH descriptor: [Thoracic Surgical Procedures] explode all trees
#72 MeSH descriptor: [Transplantation] explode all trees
#73 MeSH descriptor: [Ultrasonic Surgical Procedures] explode all trees
#74 MeSH descriptor: [Urogenital Surgical Procedures] explode all trees
#75 MeSH descriptor: [Wound Closure Techniques] explode all trees
#76 #1 or #2 or #3 or #4 or #5 or #6 or #7 or #8 or #9 or #10
#77 #11 or #12 or #13 or #14 or #15 or #16 or #17 or #18 or #19 or #20
#78 #21 or #22 or #23 or #24 or #25 or #26 or #27 or #28 or #29 or #30
#79 #31 or #32 or #33 or #34 or #35 or #36 or #37 or #38 or #39 or #40

#80 #41 or #42 or #43 or #44 or #45 or #46 or #47 or #48 or #49 or #50
#81 #51 or #52 or #53 or #54 or #55 or #56 or #57 or #58 or #59 or #60
#82 #61 or #62 or #63 or #64 or #65 or #66 or #67 or #68 or #69 or #70
#83 #71 or #72 or #73 or #74 or #75
#84 #76 or #77 or #78 or #79 or #80 or #81 or #82 or #83
#85 (elective or plan*) near/2 (surgery or surgical):ti,ab,kw (Word variations have been searched)
#86 #84 or #85
#87 MeSH descriptor: [Occupational Therapy] explode all trees
#88 occupational near/3 (advice or advis* or guidance or information or intervention* or therap*):ti,ab,kw (Word variations have been searched)
#89 #87 or #88
#90 #86 and #88

EMBASE via OVID <1974 to 2016 August 18>, 209 records identified

1 *surgery/ or exp *abdominal surgery/ or exp *ambulatory surgery/ or exp *breast surgery/ or exp *cancer surgery/ or exp *cardiovascular surgery/ or exp *ear nose throat surgery/ or exp *elective surgery/ or exp *endocrine surgery/ or exp *eye surgery/ or exp *general surgery/ or exp *"head and neck surgery"/ or exp *major surgery/ or exp *minimally invasive surgery/ or exp *nanosurgery/ or exp *neurosurgery/ or exp *orthopedic surgery/ or exp *pelvis surgery/ or exp *plastic surgery/ or exp *postoperative period/ or exp *prophylactic surgical procedure/ or exp *thorax surgery/ or exp *transplantation/ or exp *urologic surgery/ (1842495)
2 ((elective or plan$) adj2 (surgery or surgical)).ti,ab. (36275)
3 1 or 2 (1864768)
4 occupational therapy/ or occupational therapist/ (22937)
5 (occupational adj3 (advice or advis$ or guidance or information or intervention$ or therap$)).ti,ab. (18412)
6 4 or 5 (28298)
7 3 and 6 (651)
8 limit 7 to (english language and yr="1996 -Current") (432)
9 limit 8 to embase (384)
10 (conference or conference paper or conference proceeding or conference proceeding article or conference proceeding conference paper or conference proceeding editorial or conference proceeding note or "conference proceeding review" or journal conference abstract or journal conference paper or "journal conference review").pt. (3065391)
11 9 not 10 (279)
12 (editorial or letter).pt. (1471286)
13 11 not 12 (269)
14 case report/ (2125490)
15 13 not 14 (209)
16 (animal or animals or cat or cats or dog or dogs or mouse or mice or rat or rats or pig or pigs or porcine or horse or horses or equine or sheep or goat or goats or ovine or cow or cows or cattle or bovine or rabbit$ or bird or birds).ti. (2171080)
17 15 not 16 (209)

MEDLINE Via OVID, search date of 23rd August 2016, 319 records identified
Database: Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Ovid MEDLINE(R) Daily and Ovid MEDLINE(R) <1946 to Present>
Search Strategy:

1 exp surgical procedures, operative/ or ablation techniques/ or exp ambulatory surgical procedures/ or exp anastomosis, surgical/ or exp assisted circulation/ or exp bariatric surgery/ or exp biopsy/ or "bloodless medical and surgical procedures"/ or exp body modification, non-therapeutic/ or exp cardiovascular surgical procedures/ or exp curettage/ or cytoreduction surgical procedures/ or debridement/ or exp decompression, surgical/ or deep brain stimulation/ or device removal/ or exp digestive system surgical procedures/ or dissection/ or exp drainage/ or elective surgical procedures/ or electrosurgery/ or exp endocrine surgical procedures/ or exp extracorporeal circulation/ or exp hemostasis, surgical/ or laparotomy/ or ligation/ or exp lymph node excision/ or exp mastectomy/ or metastasectomy/ or exp microsurgery/ or exp minimally invasive surgical procedures/ or minor surgical procedures/ or exp monitoring, intraoperative/ or exp obstetric surgical procedures/ or exp neurosurgical procedures/ or exp ophthalmologic surgical procedures/ or exp filtering surgery/ or exp light coagulation/ or exp refractive surgical procedures/ or exp oral surgical procedures/ or exp orthopedic procedures/ or exp ostomy/ or exp otorhinolaryngologic surgical procedures/ or exp pelvic exenteration/ or exp perioperative care/ or exp perioperative period/ or prophylactic surgical procedures/ or exp prosthesis implantation/ or exp punctures/ or exp reconstructive surgical procedures/ or reoperation/ or second-look surgery/ or splenectomy/ or exp surgery, computer-assisted/ or symphysiotomy/ or exp thoracic surgical procedures/ or exp transplantation/ or exp ultrasonic surgical procedures/ or exp urogenital surgical procedures/ or exp wound closure techniques/ (2723809)
2 exp specialties, surgical/ or exp colorectal surgery/ or exp general surgery/ or exp gynecology/ or exp neurosurgery/ or exp obstetrics/ or exp ophthalmology/ or exp orthognathic surgery/ or exp orthopedics/ or exp otolaryngology/ or exp surgery, plastic/ or exp thoracic surgery/ or exp traumatology/ or exp urology/ or exp sports medicine/ (192168)
3 ((elective or plan$) adj2 (surgery or surgical)).ti,ab. (27370)
4 1 or 2 or 3 (2872395)
5 Occupational Therapy/ (11460)
6 (occupational adj3 (advice or advis$ or guidance or information or intervention$ or therap$)).ti,ab. (12732)
7 5 or 6 (17965)
8 4 and 7 (612)
9 limit 8 to (English language and yr="1996 -Current") (319)

OTseeker via http://www.otseeker.com/
Title/Abstract] like ‘surgery’ OR [Title/Abstract] like ‘surgical’ 162
143 records after limiting to 1996 onwards

Section 2: Data extraction form templates

Data Extraction Form (Systematic Reviews)

Source	
Author: Year:	
Confirm eligibility for review	
Reason:	
Review methods	
Objective of review: <u>Search strategies</u> Searched databases: Literature search end date: Search strategies available? Languages: Types of studies included: Setting: Population: Type of interventions: Work-related outcomes: Other outcomes: Quality assessment tools used: Type of analysis (meta-analysis/narrative synthesis:	
Surgical procedure type/musculoskeletal condition	
Summary of results	
No. studies included: Total no. of participants/ sample sizes: Did any of the studies: - include an occupational advice component? - report a work-related outcome? What measures were used? Were any data reported on barriers and facilitators?	

Key authors' conclusions	
Risk of bias	
Use separate tool	
Miscellaneous	
Reference to other relevant studies: Correspondence required: Misc. comments by review authors: Misc. comments from data extractor:	

Data Extraction Form (Primary Studies)

Source	
Author: Year:	
Confirm eligibility for review	
Reason:	
Participants	
Total number: Country: Setting: % male: Mean or median age: Any age restrictions: Ethnicity: Co-morbidities (yes/no) Socio-demographic details of relevance: Date of pts entering study:	
Study methods	
Study objective: Study design: Outcome measurement (outcomes relevant to us): (other outcomes): Follow-up duration: Blinding:	
Surgical procedure type	
Intervention details	
Total no. groups: *For each intervention & comparison group of interest:* Intervention name: <u>Description</u> Content of intervention: Methods/ tools used for delivery Who delivered intervention: Setting: Description of theoretical basis (e.g. behavioural change theory): Intervention manual available from another source?	

Comparator name: Description Content of intervention: Methods/ tools used for delivery Who delivered intervention: Setting: Description of theoretical basis:	
Process measures related to delivery of interventions	
Barriers & facilitators: Stakeholder perspectives (patients, healthcare professionals,employers):	
Outcomes e.g. outcome measures used to assess return to work, return to normal activities & social participation.	
For each outcome of interest: Outcome name: Time points measured: Time points reported: Outcome definition: Unit of measurement: For scales: upper & lower limits, whether low or high score is good:	
Results	
No. participants allocated to each intervention group: *For each outcome of interest:* No. participants: No. missing participants: Summary data for each intervention group* Estimate of effect (with CI, p value) Subgroup analyses:	
Risk of bias	
Use separate tool	
Miscellaneous	
Misc. comments from	

study authors: Reference to other relevant studies: Correspondence required: Misc. comments from data extractor:	

* e.g. 2X2 table for dichotomous data, means and SDs for continuous data

Data Extraction Form (Qualitative Studies)

Source	
Author: Year:	
Confirm eligibility for review	
Reason:	
Participants	
Participants (number, description): Country: Setting: % male: Study conducted during:	
Study objective	
Surgical procedure type	
Method of evaluation and underpinning methodology	
Views and experiences (related to return to work/normal activities/social participation)	
Process measures related to delivery of interventions	
Barriers & facilitators: Stakeholder perspectives (patients, healthcare professionals,employers):	
Risk of bias	
Use separate 'Risk of bias' tool	
Miscellaneous	
Misc. comments from study authors: Reference to other relevant studies: Correspondence required:	

Misc. comments from data extractor:	

* e.g. 2X2 table for dichotomous data, means and SDs for continuous data

Section 3: List of the 50 full text systematic reviews screened for eligibility

List of included systematic reviews

Oosterhuis T, Costa LO, Maher CG, et al. Rehabilitation after lumbar disc surgery. *Cochrane Database of Systematic Reviews* 2014;3 doi: 10.1002/14651858.CD003007.pub3[169]

Aas RW, Tuntland H, Holte KA, et al. Workplace interventions for neck pain in workers. *Cochrane Database of Systematic Reviews* 2011;4 doi: 10.1002/14651858.CD008160.pub2[83]

Carroll C, Rick J, Pilgrim H, et al. Workplace involvement improves return to work rates among employees with back pain on long-term sick leave: a systematic review of the effectiveness and cost-effectiveness of interventions (Structured abstract). *Disability and Rehabilitation* 2010;32(8):607-21.[84]

Désiron HA, de Rijk A, Van Hoof E, et al. Occupational therapy and return to work: a systematic literature review. *BMC Public Health* 2011;11(1):615. doi: 10.1186/1471-2458-11-615[85]

Elders LA, Beek AJ, Burdorf A. Return to work after sickness absence due to back disorders: a systematic review on intervention strategies (Structured abstract). *International Archives of Occupational and Environmental Health* 2000;73(5):339-48.[86]

Franche RL, Cullen K, Clarke J, et al. Workplace-based return-to-work interventions: a systematic review of the quantitative literature (Structured abstract). *Journal of Occupational Rehabilitation* 2005;15(4):607-31.[87]

Kamper SJ, Apeldoorn AT, Chiarotto A, et al. Multidisciplinary biopsychosocial rehabilitation for chronic low back pain. *Cochrane Database of Systematic Reviews* 2014;9 doi: 10.1002/14651858.CD000963.pub3[88]

Karjalainen KA, Malmivaara A, van TMW, et al. Multidisciplinary rehabilitation for fibromyalgia and musculoskeletal pain in working age adults. *Cochrane Database of Systematic Reviews* 1999;3 doi: 10.1002/14651858.cd001984[89]

Karjalainen KA, Malmivaara AO, Tulder MW, et al. Biopsychosocial rehabilitation for repetitive-strain injuries among working-age adults (Structured abstract). *Scandinavian Journal of Work, Environment and Health* 2000;26(5):373-81.[90]

Karjalainen KA, Malmivaara A, van TMW, et al. Multidisciplinary biopsychosocial rehabilitation for neck and shoulder pain among working age adults. *Cochrane Database of Systematic Reviews* 2003;2 doi: 10.1002/14651858.cd002194[99]

Meijer EM, Sluiter JK, Frings-Dresen MH. Evaluation of effective return-to-work treatment programs for sick-listed patients with non-specific musculoskeletal complaints: a systematic review (Provisional abstract). *International Archives of Occupational and Environmental Health* 2005;78(7):523-32.[92]

Nevala N, Pehkonen I, Koskela I, et al. Workplace accommodation among persons with disabilities: a systematic review of its effectiveness and barriers or facilitators (Provisional abstract). *Database of Abstracts of Reviews of Effects* 2014(2):epub.[93]

Norlund A, Ropponen A, Alexanderson K. Multidisciplinary interventions: review of studies of return to work after rehabilitation for low back pain (Structured abstract). *Journal of Rehabilitation Medicine* 2009;41(3):115-21.[94]

Palmer KT, Harris EC, Linaker C, et al. Effectiveness of community- and workplace-based interventions to manage musculoskeletal-related sickness absence and job loss: a systematic review (Provisional abstract). *Rheumatology* 2012;51(2):230-42.[95]

Schaafsma FG, Whelan K, van dBAJ, et al. Physical conditioning as part of a return to work strategy to reduce sickness absence for workers with back pain. *Cochrane Database of Systematic Reviews* 2013;8 doi: 10.1002/14651858.CD001822.pub3 [96]

Vargas-Prada S, Demou E, Lalloo D, et al. Effectiveness of very early workplace interventions to reduce sickness absence: a systematic review of the literature and meta-analysis. *Scand J Work Environ Health* 2016;42(4):261-72. doi: http://dx.doi.org/10.5271/sjweh.3576 [97]

Williams RM, Westmorland MG, Lin CA, et al. Effectiveness of workplace rehabilitation interventions in the treatment of work-related low back pain: a systematic review (Structured abstract). *Disability and Rehabilitation* 2007;29(8):607-24.[98]

List of excluded systematic reviews with reason for exclusion

Table 23: Excluded systematic reviews (from full paper screening)

Aas RW, Tuntland H, Holte KA, Røe C, Labriola M. Workplace interventions for low-back pain in workers. Cochrane Database Syst Rev 2009;4 doi: 10.1002/14651858.cd008159 [170]	Insufficient information (protocol only)
Aberg F. From prolonging life to prolonging working life: Tackling unemployment among liver-transplant recipients. World J Gastroenterol 2016;22(14):3701-11 doi: http://dx.doi.org/10.3748/wjg.v22.i14.3701[171]	Not occupational advice
Bigos SJ, Holland J, Holland C, Webster JS, Battie M, Malmgren JA. High-quality controlled trials on preventing episodes of back problems: systematic literature review in working-age adults (Structured abstract). Spine Journal 2009;9(2):147-68 [172]	Not occupational advice
Bond-Smith G, Belgaumkar AP, Davidson BR, Gurusamy KS. Enhanced recovery protocols for major upper gastrointestinal, liver and pancreatic surgery. Cochrane Database Syst Rev 2016;2:CD011382 doi: http://dx.doi.org/10.1002/14651858.CD011382.pub2 [173]	Not occupational advice
Brown HE, Gilson ND, Burton NW, Brown WJ. Does physical activity impact on presenteeism and other indicators of workplace well-being? (Provisional abstract). Sports Med 2011;41(3):249-62 [174]	Not occupational advice
Corbiere M, Shen J. A systematic review of psychological return-to-work interventions for people with mental health problems and/or physical injuries (Structured abstract). Can J Commun Ment Health 2006;25(2):261-88 [175]	Not for relevant population
Ebrahim S, Malachowski C, Kamal El Din M, et al. Measures of patients' expectations about recovery: a systematic review. J Occup Rehabil 2015;25(1):240-55 doi: http://dx.doi.org/10.1007/s10926-014-9535-4[176]	Not occupational advice
Ellis DJ, Mallozzi SS, Mathews JE, et al. The Relationship between Preoperative Expectations and the Short-Term Postoperative Satisfaction and Functional Outcome in Lumbar Spine Surgery: A Systematic Review. Global spine j 2015;5(5):436-52 doi: http://dx.doi.org/10.1055/s-0035-1551650 [177]	Not occupational advice
Engers AJ, Jellema P, Wensing M, van dWDA, Grol R, van TMW. Individual patient education for low back pain. Cochrane Database Syst Rev 2008;1 doi: 10.1002/14651858.CD004057.pub3 [178]	Not occupational advice
Euler U, Wegewitz UE, Schmitt J, Adams J, van DJL, Seidler A. Interventions to support return-to-work for patients with coronary heart disease. Cochrane Database Syst Rev 2013;9 doi: 10.1002/14651858.cd010748[179]	Insufficient information (protocol only)
Faber E, Kuiper JI, Burdorf A, Miedema HS, Verhaar JA. Treatment of impingement syndrome: a systematic review of the effects on functional limitations and return to work (Provisional abstract). J Occup Rehabil 2006;16(1):7-25 [180]	Not occupational advice
Handoll HH, Elliott J. Rehabilitation for distal radial fractures in adults. Cochrane Database Syst Rev 2015;9 doi: 10.1002/14651858.CD003324.pub3 [181]	Not for relevant population
Heymans MW, van TMW, Esmail R, Bombardier C, Koes BW. Back schools for non-specific low-back pain. Cochrane Database Syst Rev	Not occupational advice

2004;4 doi: 10.1002/14651858.CD000261.pub2 [182]	
Hlobil H, Staal JB, Spoelstra M, Ariens GA, Smid T, Mechelen W. Effectiveness of a return-to-work intervention for subacute low-back pain (Provisional abstract). Scand J Work Environ Health 2005;31(4):249-57 [183]	Not for relevant population
Hou W-H, Chi C-C, Lo H-LD, Kuo KN, Chuang H-Y. Vocational rehabilitation for enhancing return-to-work in workers with traumatic upper limb injuries. Cochrane Database Syst Rev 2013;10 doi: 10.1002/14651858.CD010002.pub2 [184]	Not for relevant population
Huda A, Newcomer R, Harrington C, Keeffe EB, Esquivel CO. Employment after liver transplantation: a review. Transplant Proc 2015;47(2):233-9 doi: http://dx.doi.org/10.1016/j.transproceed.2014.10.022 [185]	Not occupational advice
Karjalainen, K., Malmivaara A, Tulder M, et al. "Multidisciplinary biopsychosocial rehabilitation for neck and shoulder pain among working age adults: a systematic review within the framework of the Cochrane Collaboration Back Review Group (Structured abstract)." Spine 2001; 26(2): 174-181.[100]	Superseded by a more updated version (Karjalainen 2003)
Karjalainen K, Malmivaara A, Tulder M, et al. Multidisciplinary biopsychosocial rehabilitation for subacute low back pain in working-age adults: a systematic review within the framework of the Cochrane Collaboration Back Review Group (Structured abstract). Spine 2001;26(3):262-69 [186]	Not for relevant population
Karjalainen KA, Malmivaara A, van TMW, et al. Multidisciplinary biopsychosocial rehabilitation for subacute low-back pain among working age adults. Cochrane Database Syst Rev 2003;2 doi: 10.1002/14651858.cd002193 [99]	Not for relevant population
Krause N, Dasinger LK, Neuhauser F. Modified work and return to work: a review of the literature (Structured abstract). J Occup Rehabil 1998;8(2):113-39 [187]	Not occupational advice
Kuijer PPF, de Beer MJP, Houdijk JHP, Frings-Dresen MHW. Beneficial and limiting factors affecting return to work after total knee and hip arthroplasty: a systematic review. J Occup Rehabil 2009;19(4):375-81 doi: 10.1007/s10926-009-9192-1[21]	Not occupational advice
Lin C-WC, Donkers NA, Refshauge KM, Beckenkamp PR, Khera K, Moseley AM. Rehabilitation for ankle fractures in adults. Cochrane Database Syst Rev 2012;11 doi: 10.1002/14651858.CD005595.pub3.[188]	Not for relevant population
Lurati AR. Management of Acute Lumbar Injuries in the Workplace. Orthop Nurs 2016;35(3):152-8 doi: http://dx.doi.org/10.1097/NOR.0000000000000244 [189]	Not occupational advice
Ostelo RWJG, Vet HCWD, Waddell G, Kerckhoffs MR, Leffers P, Van Tulder M. Rehabilitation following first-time lumbar disc surgery: A systematic review within the framework of the Cochrane collaboration. Spine. 2003; 28(3): 209-218. [190]	Superseded by a more updated version (Oosterhuis 2014)
Parreira P, Heymans MW, van Tulder MW, et al. Back schools for chronic non-specific low back pain. Cochrane Database Syst Rev 2015;5 doi: 10.1002/14651858.cd011674 [191]	Not occupational advice
Petit A, Rozenberg S, Fassier JB, Rousseau S, Mairiaux P, Roquelaure Y. Pre-return-to-work medical consultation for low back pain workers.	Study type (not a systematic review)

Good practice recommendations based on systematic review and expert consensus. Ann Phys Rehabil Med 2015;58(5):298-304 doi: http://dx.doi.org/10.1016/j.rehab.2015.08.001 [192]	
Poquet N, Lin C-WC, Heymans MW, et al. Back schools for acute and subacute non-specific low-back pain. Cochrane Database Syst Rev 2016;4 doi: 10.1002/14651858.CD008325.pub2 [193]	Not occupational advice
Schwarz B, Neuderth S, Gutenbrunner C, Bethge M. Multiprofessional teamwork in work-related medical rehabilitation for patients with chronic musculoskeletal disorders. J Rehabil Med 2015;47(1):58-65 doi: http://dx.doi.org/10.2340/16501977-1893 [194]	Not occupational advice
Smith TO, Jepson P, Beswick A, et al. Assistive devices, hip precautions, environmental modifications and training to prevent dislocation and improve function after hip arthroplasty. Cochrane Database Syst Rev 2016;7 doi: 10.1002/14651858.CD010815.pub2 [195]	Not occupational advice
Tilbury C, Schaasberg W, Plevier JW, Fiocco M, Nelissen RG, Vliet VTP. Return to work after total hip and knee arthroplasty: a systematic review (Provisional abstract). Database of Abstracts of Reviews of Effects 2014(2):512-25 [20]	Not occupational advice
Vogel N, Schandelmaier S, Zumbrunn T, et al. Return to work coordination programmes for improving return to work in workers on sick leave. Cochrane Database Syst Rev 2015;3 doi: 10.1002/14651858.cd011618[196]	Insufficient information (protocol only)
Vooijs M, Leensen MC, Hoving JL, Wind H, Frings-Dresen MH. Interventions to enhance work participation of workers with a chronic disease: a systematic review of reviews. Occup Environ Med 2015;72(11):820-6 doi: http://dx.doi.org/10.1136/oemed-2015-103062 [197]	Study type (review of reviews)
Young AE, Besen E, Choi Y. The importance, measurement and practical implications of worker's expectations for return to work. Disabil Rehabil 2015;37(20):1808-16 doi: http://dx.doi.org/10.3109/09638288.2014.979299 [198]	Not occupational advice

Section 4: Details of the 17 included systematic reviews

Table 24: Key details of the included systematic reviews

Review	Population characteristics, sample size, total # participants and intervention type	Work-related outcomes	Summary of results in relation to RTW (based on authors summaries)
Surgical:			
Oosterhuis 2014 [82] Search[a]: 2013 #included studies: 22 #relevant studies: 1 Meta-analysis: no AMSTAR 9	**Population:** Adults aged 18-65 years who had first time lumbar disc surgery due to lumbar disc prolapse. # total participants: 2503 ***Intervention:*** active rehabilitation programs, including exercise therapy, strength and mobility training, physiotherapy and multidisciplinary programs.	Return to work (RTW status, days off work).	The authors note that no firm conclusion can be drawn relating to the program effectiveness due to lack of high- or moderate-quality evidence. No evidence was found to suggest that individuals need to restrict their activities following first-time lumbar disc surgery.
Musculoskeletal:			
Aas 2011 [83] Search[a]: 2009 #included studies: 10 #relevant studies: 0 Meta-analysis: yes AMSTAR 9	***Population:*** Adults (aged 18-67 years) with neck pain (acute, sub-acute or chronic), at work or absent from work (on sick leave, early retirement or disability pension) but still connected to workplace by employment agreements. # total participants: 2745 ***Intervention:*** group-based and individual interventions conducted at the workplace	Work absenteeism: time on benefits, sick leave, proportion RTW, employment status, shift in employment status, disability pension, early retirement.	Moderate quality evidence of a reduction in sickness absence in the intermediate term from a multiple-component intervention, although not sustained over time. The review authors highlight the need for high quality RCTs which feature well designed workplace interventions.
Carroll 2010 [84] Search[a]: 2009 #included studies: 13 #relevant studies: 1 Meta-analysis: no AMSTAR 6	***Population:*** Employees (full- or part-time) on long-term sick leave (≥2 weeks) with back pain. # total participants: 3134 ***Intervention:*** workplace (full or partial involvement)	Return to work.	Interventions encompassing consultation and consensus between stakeholders and subsequent work modifications "appear to be more effective" in terms of RTW, compared to interventions that do not contain those elements.
Desiron 2011 [85] Search[a]: 2010 #included studies: 6 #relevant studies: 4 Meta-analysis: no AMSTAR 6	***Population:*** Adults (aged 18-65 years) that had participated in rehabilitation program, with non-congenital disorders. # total participants: 899 ***Intervention:*** multidisciplinary rehabilitation program aiming at RTW	Work-related outcomes such as RTW, sick leave or employment status.	Sufficient evidence was found for rehabilitation programs which included occupational therapy interventions contributing to RTW. However, it was noted that it is not clear regarding which are the effective components, except for workplace interventions.
Elders 2000 [86] Search[a]: 1999 #included	***Population:*** Working adults with non-specific back pain or back disorders (acute, sub-acute or	Return to work, compliance, compliance	Back school type interventions were more effective, irrespective of

studies: 12 #relevant studies: 0 Meta-analysis: no AMSTAR 3	chronic). # total participants: 3939 ***Intervention:*** secondary type of non-medical prevention regarding non-specific back pain.	sustainability, effect sustainability.	their program and heterogeneity, after 60 days of sickness absence than other non back school interventions.
Franche 2005 [87] Search[a]: 2003 #included studies: 10 #relevant studies: 1 Meta-analysis: no AMSTAR 7	***Population:*** Working age adults off work due to musculoskeletal and other pain-related conditions. # total participants: 58406 ***Intervention:*** planned intervention programs aimed at reducing work disability burden.	Work disability duration: self-reported time to RTW, time on benefits, duration of lost time recurrences, point prevalence of status (back at work vs. not back at work).	Evidence was found to support workplace-based RTW interventions reducing work disability duration and associated cost. Strong evidence demonstrated work disability being significantly reduced via work accommodation offers and contact between healthcare provider and workplace. There was moderate evidence that it reduced through interventions including early contact with worker by the workplace, ergonomic work site visits and presence of a RTW coordinator.
Kamper 2014 [88] Search[a]: 2014 #included studies: 41 #relevant studies: 13 Meta-analysis: yes AMSTAR 8	***Population:*** Adults over age 18 years with non-specific chronic (≥12 weeks) low back pain. # total participants: 6858 ***Intervention:*** multidisciplinary biopsychosocial rehabilitation (MBR).	Work status: return to work, sick leave.	MBR positively influences work status when compared to physical treatment, although effects were found to be modest in size and should be balanced against the resource and time requirements of MBR programs.
Karjalainen 1999 [89] Search[a]: 1998 #included studies: 7 #relevant studies: 1 Meta-analysis: no AMSTAR 7	***Population:*** Adults (aged 18-65 years) with fibrimyalgia or widespread musculoskeletal pain. # total participants: 1050 ***Intervention:*** multidisciplinary rehabilitation, either inpatient or outpatient.	Ability to work (e.g. sickness absence, return to work, number of days off work)	Little scientific evidence was found for the effectiveness of multidisciplinary rehabilitation for the musculoskeletal disorders under consideration.
Karjalainen 2000 [90] Search[a]: 1998 #included studies: 2 #relevant studies: 0 Meta-analysis: no AMSTAR 8	***Population:*** Adults (aged 18-65 years) with upper extremity repetitive strain injuries. # total participants: 80 ***Intervention:*** biopsychosocial rehabilitation program, either inpatient or outpatient.	Ability to work (e.g. sickness absence, return to work, number of days off work)	The review found little scientific evidence for the effectiveness of biopsychosocial rehabilitation on repetitive strain injuries.
Karjalainen 2003	***Population:*** Adults (aged 18-65	Ability to work (e.g.	There appeared to be little

[99] Search[a]: 2002 #included studies: 2 #relevant studies: 0 Meta-analysis: no AMSTAR 8	years) with neck or shoulder pain. # total participants: 177 ***Intervention:*** multidisciplinary biopsychosocial rehabilitation program, either inpatient or outpatient.	sickness absence, return to work, number of days off work)	scientific evidence for the effectiveness of MBR on neck and shoulder pain compared to other rehabilitation methods.
Meijer 2005 [92] Search[a]: 2004 #included studies: 22 #relevant studies: 11 Meta-analysis: no AMSTAR 4	***Population:*** Sick listed adults (aged 18-65 years) with chronic non-specific musculoskeletal disorders. # total participants: 3579 ***Intervention:*** RTW intervention focusing on 5 categories of conditioning: knowledge, physical, psychological, social or work.	Return to work: defined as the difference in sick leave after treatment compared to sick leave preceding entry into treatment program.	Inconsistent findings regarding the effectiveness of treatment programs in terms of RTW. With the exception of low back pain, no studies explicitly itemised the program's RTW effects according to regional musculoskeletal disorders (e.g. upper extremity musculoskeletal disorders).
Nevala 2015 [93] Search[a]: 2012 #included studies: 11 #relevant studies: 1 plus qualitative studies Meta-analysis: no AMSTAR 5	***Population:*** Adults (aged 18-68 years) with permanent disability (physical cognitive or mental disability; visual or hearing impairment,). # total participants: 1060 ***Intervention:*** workplace accommodation, occupational or vocational rehabilitation, assistive technology interventions.	Employment (getting and maintaining employment, return to work), work ability (functioning, sick leave).	Moderate evidence was found for specific forms of workplace accommodation promoting employment and reducing costs among those with physical disabilities. There was low evidence regarding workplace accommodation coordinated by case-managers increasing RTW and being cost-effective among those with physical or cognitive disabilities.
Norlund 2009 [94] Search[a]: 2006 #included studies: 7 #relevant studies: 4 Meta-analysis: yes AMSTAR 6	***Population:*** Adults (aged 19-64 years) with low back pain (sub-acute or chronic). # total participants: 1450 Sample size range: ***Intervention:*** multidisciplinary interventions involving 2 or more health disciplines.	Return to work, measured either directly or indirectly as sick leave days, with the opportunity to turn sick leave into RTW.	Meta-analysis of all studies indicated limited effect, but with possible publication bias, therefore the evidence is questionable. When limited to studies undertaken in similar Scandinavian settings for individuals with low back pain on sick leave for at least 4 weeks, evidence of multi-disciplinary interventions having a significant effect on RTW was found.
Palmer 2012 [95] Search[a]: 2010 #included studies: 42 #relevant studies: 11	***Population:*** Working adults with musculoskeletal disorder (MSD) and/or were on sick leave with an MSD at entry, or taken sick leave in past 12 months. # total participants: 10547	Return to work, avoidance of health-related job loss and mean days sick leave per month over follow-up.	Most interventions appeared effective, although less benefit was shown by larger and better quality studies, indicating publication bias. For the

Meta-analysis: no AMSTAR 6	***Intervention:*** delivered in primary care or workplace setting, or conducted in collaboration with employers or primary care providers.		better conducted studies, a median benefit of 10% improved chance of returning to work or avoidance of 0.3-0.5 days per month of sickness absence were demonstrated.
Schaafsma 2013 [96] Search[a]: 2012 #included studies: 25 #relevant studies: 12 Meta-analysis: yes AMSTAR 8	***Population:*** Adults (aged >16 years) with work disability related to back pain (acute, sub-acute or chronic), involved in physical conditioning programs. # total participants: 4404 ***Intervention:*** physical conditioning programs that comprised exercises designed for restoration of systemic, neurological, musculoskeletal or cardiopulmonary function; with an intended improvement in work status; the intervention is related to the job demands.	Work status outcomes: time between intervention and RTW; RTW status in terms of 'at work' or 'off work'; time on light or modified duties.	The effectiveness of physical conditioning compared to usual care or exercise therapy remains unclear. For individuals with chronic back pain, physical conditioning has a small effect on reducing sick leave when compared to usual care after 12 months follow-up. The extent to which physical conditioning as part of integrated care management might affect sick leave for workers with chronic back pain requires further research.
Vargas-Prada 2016 [97] Search[a]: 2014 #included studies: 3 #relevant studies: 0 Meta-analysis: yes AMSTAR 6	***Population:*** Workers on sick leave ≤15 days # total participants: 419 ***Intervention:*** workplace interventions – carried out at workplace before day 15 of sickness absence, implemented by employer, including involvement from internal/external occupational health services.	Rates of and time until RTW, productivity loss and days lost, duration of sick leave, recurrences of sickness absence episodes (primary outcomes). Satisfaction with intervention, either of employees, line managers or employers (secondary outcomes).	There was limited evidence regarding the benefits of very early workplace interventions regarding RTW compared to usual care, with no significant differences in terms of productivity loss. The positive RTW impact of intervention within the first two weeks of sickness absence is stronger for workers with musculoskeletal disorders and less for those with mental health problems.
Williams 2007 [98] Search[a]: 2005 #included studies: 10 #relevant studies: 1 Meta-analysis: no AMSTAR 5	***Population:*** Injured workers with musculoskeletal work-related low back pain. # total participants: 2909 ***Intervention:*** interventions conducted at the workplace, or secondary prevention interventions for the condition.	Return to work status, duration of work absence/sick leave, time lost.	The review identified that there is some evidence on the effectiveness of workplace rehabilitation interventions for injured workers with low back pain.

[a] search end date

Note: total number of participants was seldom reported and hence derived from the individual sample sizes reported for the included studies.

Note: broad conclusions from the review in relation to RTW have been included in the table, rather than more specific detail, since all reviews include some irrelevant studies. The table including the individual relevant studies (Table 3) shows more detail in terms of whether work-related outcomes were significant etc.

Table 25: Methodological quality summary of systematic reviews using AMSTAR[78]

AMSTAR criteria	**Aas 2011**	**Carroll 2010**	**Desiron 2011**	**Elders 2000**	**Franche 2005**	**Kamper 2014**	**Karjalainen 1999**	**Karjalainen 2000**	**Karjalainen 2003**
1. Was an 'a priori' design provided?	Yes	CA	CA	CA	CA	CA[a]	CA[b]	No	CA
2. Was there duplicate study selection and data extraction?	Yes	No	No	CA	Yes	No	Yes	Yes	Yes
3. Was a comprehensive literature search performed?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4. Was the status of publication (i.e. grey literature) used as an inclusion criterion?	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
5. Was a list of studies (included and excluded) provided?	Yes	No	No	No	No	Yes	CA	Yes	Yes
6. Were the characteristics of the included studies provided?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
7. Was the scientific quality of the included studies assessed and documented?	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
8. Was the scientific quality of the included studies used appropriately in formulating conclusions?	Yes	Yes	Yes	NA	Yes	Yes	Yes	Yes	Yes
9. Were the methods used to combine the findings of studies appropriate?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10. Was the likelihood of publication bias assessed?	No	No	No	No	No	Yes	No	No	No
11. Was the conflict of interest included? (for review and each of the included studies)	No	No	No	No	No	No	No	No	No
Total score (out of 11)	9	6	6	3	7	8	7	8	8

[a] Article makes reference to a protocol and author correspondence confirms a protocol was used but could not be found on Cochrane website; b report makes reference to an a priori decision but protocol not found; CA can't answer; NA not applicable

AMSTAR criteria	Meijer 2005	Nevala 2015	Norlund 2009	Oosterhuis 2014	Palmer 2012	Schaafsma 2013	Vargas-Prada 2016	Williams 2007
1. Was an 'a priori' design provided?	CA	CA	CA	Yes	CA	CA[b]	CA	CA
2. Was there duplicate study selection and data extraction?	No	CA	CA	Yes	No	Yes	Yes	Yes
3. Was a comprehensive literature search performed?	Yes	Yes	No	Yes	Yes	Yes	Yes	No
4. Was the status of publication (i.e. grey literature) used as an inclusion criterion?	No	No	No	Yes	No	Yes	No	No
5. Was a list of studies (included and excluded) provided?	No	No	Yes	Yes	No	Yes	No	No
6. Were the characteristics of the included studies provided?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
7. Was the scientific quality of the included studies assessed and documented?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
8. Was the scientific quality of the included studies used appropriately in formulating conclusions?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
9. Were the methods used to combine the findings of studies appropriate?	NA	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10. Was the likelihood of publication bias assessed?	No	No	Yes	No	Yes	No	No	No
11. Was the conflict of interest included? (for review and each of the included studies)	No	No	No	No	No	No	No	No
Total score (out of 11)	4	5	6	9	6	8	6	5

CA can't answer; NA not applicable

Section 5: Summary of relevant studies from included reviews, for work-related outcomes

Table 26: Summary of relevant studies from the included reviews, regarding work-related outcomes

Study	Title of study	Population	Intervention details	Work-related findings
Surgical:				
Donceel 1999 [117] [From review by: Oosterhuis 2014]	Cluster RCT comparing rehabilitation-oriented approach focused on early mobilisation and early resumption of professional activities for lumbar disc herniation surgery with usual claim-based practice.	Workers who had surgery for herniated lumbar disc.	Medical advisors asked to base their medical practice on 3 rehabilitation guidelines: involving contact with patients, the treating physicians and fellow medical advisors. Comparator: medical advisors asked to undertake medical practice as did in the past, i.e. usual claim based practice.	A statistically significant difference was found between the groups regarding return to work; the intervention group had a higher RTW rate (log-rank test: P<0.001).
Musculoskeletal:				
Allaire 2003 [111] [From review by: Nevala 2014]	Reduction of Job Loss in Persons With Rheumatic Diseases Receiving Vocational Rehabilitation. A Randomised Controlled Trial.	Employed (aged 18-65), with a rheumatic disease and at risk for job loss.	Job retention vocational rehabilitation intervention consisting of: job accommodation; vocational counselling and guidance; and education and self-advocacy. Comparator: control group received same pamphlets/flyers on management of health-related employment problems and available resources as the intervention group.	Intervention was effective at preventing job loss when provided to those at risk for job loss but are still employed: job loss was delayed and reduced in incidence.
Altmaier 1992 [199] [From review by Meijer 2005, Schaafsma 2013]	The effectiveness of psychological interventions for the rehabilitation of low back pain: a randomized controlled trial evaluation.	Patients with low back pain, not currently working due to pain (lasting between 3 and 30 months).	Standard inpatient rehabilitation program (multidisciplinary approach, involving physical therapy, education classes and vocational rehabilitation) with additional psychological components. Comparator: control group received same standard treatment program as intervention group.	Based on the conservative RTW measure, the difference between the control group (67%) and psychological group (48%) was not significant. Results were also non-significant when the liberal measure was used.
Arnetz 2003 [112] [From review by: Franche 2005, Meijer 2005,	Early Workplace Intervention for Employees With Musculoskeletal-Related Absenteeism: A Prospective	Patients with physician-diagnosed musculoskeletal disorders.	Early workplace intervention comprising a more proactive role for insurance case managers and workplace ergonomic interventions (which involved employee,	The number of sick days was significantly reduced in the intervention group compared to the comparator, for all three

Palmer 2012, Kamper 2014]	Controlled Intervention Study.		case manager, occupational therapist/ergonomist and employer). An interview was undertaken covering several topics/foci, a workplace visit and vocational training. Comparator: traditional case management, i.e. received same study information and questionnaires as intervention group, but not the interview or worksite visits.	assessment periods (0-6months, 6-12 months, 0-12 months).
Bendix 1996/ 1998 [101, 102] [From review by: Kamper 2014, Schaafsma 2013]	1998: A prospective, randomized 5-year follow-up study of functional restoration in chronic low back pain patients. 1996: Multidisciplinary intensive treatment for chronic low back pain: a randomized, prospective study.	Chronic low back pain patients.	Functional restoration intervention: aerobics, weight training, work simulation, work hardening, relaxation, psychological group, stretching, theoretical class, recreation. Comparator: participants were not treated by the study team but could go elsewhere for treatment.	There was a significant difference (P<0.001) between the intervention and control groups in terms of the number of patients able to work at 4-month follow-up.
Bendix 1995/ 1998 [101, 200] [From review by: Kamper 2014, Meijer 2005]	1995: Active treatment programs for patients with chronic low back pain: a prospective, randomized, observer-blinded study.	Chronic low back pain patients.	Functional restoration intervention: aerobics, weight training, work simulation, work hardening, relaxation, psychological group, stretching, theoretical class, recreation. Comparator A: active physical training. Comparator B: active combined with psychophysical program.	Regarding sick leave days, a significant difference was found between comparator group B and the other two groups (p=0.005). There was no difference between intervention group and comparator group A (p=0.5).
Bendix 2000 [201] [From review by: Kamper 2014, Norlund 2009, Scaafsma 2013]	Functional restoration versus outpatient physical training in chronic low back pain. A randomized comparative study.	Chronic low back pain patients	Functional restoration program: focused on self-responsibility, activity and a multidisciplinary approach, including work-hardening as part of occupational therapy. Comparator: outpatient intensive physical training.	No difference in work-related variables was found between the two programs.
Bethge 2011 [202] [From review by: Schaafsma 2013]	Work status and health-related quality of life following multimodal work hardening: a cluster randomised trial	Patients with musculoskeletal disorders (with at least 12 weeks sick leave in the year	Multimodal work hardening: a work-related extension of conventional MSK rehabilitation program. It comprised 6 modules on: work and health; occupational	The odds of having a positive work status (working with ≤6 weeks sick leave) were approximately 2.4 times higher

		before rehabilitation, or subjective expectation of long-term restrictions affecting occupational duties, or health-related unemployment)	competence; two exercise modules; functional capacity training; relaxation. Comparator: conventional musculoskeletal rehabilitation.	in the MWH group than the control, being statistically significant, at 6 months. At 12 months however, the between group effect (OR 1.914) was not significant.
Bultmann 2009 [113] [From review by: Palmer 2012]	Coordinated and Tailored Work Rehabilitation: A Randomized Controlled Trial with Economic Evaluation Undertaken with Workers on Sick Leave Due to Musculoskeletal Disorders	Workers on sick leave for back pain or musculoskeletal disorders	Coordinated and tailored work rehabilitation intervention, comprising: 1) work disability screening; 2) formulation and implementation of a coordinated, tailored and action-oriented work rehabilitation plan, developed in collaboration by an interdisciplinary team using a feedback guided approach. Comparator: conventional case management.	For all three follow-up points, a higher proportion of participants returned to work in the intervention group compared to the control group.
Coole 2013 [119] [From review by: Kamper 2014]	Individual work support for employed patients with low back pain: a randomized controlled pilot trial	Employed individuals who expressed concern over ability to work due to back pain.	Targeted vocational sessions in collaboration with group multidisciplinary rehabilitation for low back pain: group rehabilitation on self-management of back pain comprising education and physical conditioning; and individual work support from occupational therapist. Comparator: the same group multidisciplinary back pain rehabilitation as the intervention group.	The effectiveness of the intervention on work ability was equivocal. According to the Work Ability Index, a better outcome was reported for the intervention group compared to the control group. However, this was not the case according to the Graded Reduced Work Ability Scale.
Corey 1996 [116] [From review by: Meijer 2005, Schaafsma 2013]	A limited functional restoration program for injured workers: a randomized trial	Soft tissue injuries (majority related to back pain, and also shoulders, lower extremity, neck and thoracic); workers compensation board claimants.	Interdisciplinary program emphasising a functional restoration approach to rehabilitation: focus on active physical therapy, work hardening, education in posture and body mechanics, group education and counselling, and active pain management strategies. Comparator: referred back to family doctors for usual care.	A significant effect was found in terms of the number of individuals in the intervention group reporting that they were back at work (p=0.02).
Durand 2001 [109]	Therapeutic Return to Work:	Work-related thoracic or	Therapeutic return to work (TRW): work	The TRW group had a

[From review by: Carroll 2010, Palmer 2012, Williams 2007]	Rehabilitation in the workplace	lumbar pain (>90 days).	rehabilitation program is proposed; an agreement between occupational therapist and work supervisor on the expectations of worker; injured worker placed in a supplemental position and helps a co-worker do partial tasks of job; injured worker progressively increases duties. Comparator 1: functional restoration therapy (no TRW) Comparator 2: community services (excluded any rehabilitation) Comparator 3: no treatment (workers referred for program but denied it by Compensation Board).	significantly higher RTW rate only when compared to functional rehabilitation control and the no treatment control groups raw scores.
Feuerstein 1993 [110] [From review by: Palmer 2012]	Multidisciplinary rehabilitation of chronic work-related upper extremity disorders. Long-term effects.	Chronic work-related musculoskeletal disorders of the upper extremeties; work-disabled for minimum of 3 months.	Multidisciplinary work re-entry rehabilitation program: exercises, physical conditioning, work conditioning/simulation, job-related pain and stress management, ergonomic consultation, and vocational counselling/placement. Comparator: usual care - did not receive the multidisciplinary rehabilitation.	The percentage who returned to work in the intervention group was significantly higher than those in the usual care control group.
Haldorsen 1998 [120] [From review by: Meijer 2005, Palmer 2012]	Multimodal cognitive behavioral treatment of patients sicklisted for musculoskeletal pain. A randomized controlled study.	Patients sick-listed for musculoskeletal pain (for 8 weeks).	Multidisciplinary rehabilitation program: physical treatment, cognitive behavioural modification, education, and workplace-based interventions. Comparator: control group were followed up by GPs without any feedback or advice on therapy.	There were no significant differences in terms of RTW rates for the two groups. However, improvements in the intervention group occurred in terms of ergonomic behaviour, work potential, life quality and psychological health.
Haldorsen 2002 [114] [From review by: Meijer 2005, Palmer 2012]	Is there a right treatment for a particular patient group? Comparison of ordinary treatment, light multidisciplinary treatment, and extensive multidisciplinary	Sick-listed workers with musculoskeletal pain	Intervention A: light multidisciplinary treatment with follow-ups Intervention B: extensive multidisciplinary treatment program with follow-ups	Both light and extensive multidisciplinary treatment is associated with an increase in the possibility of returning to work, with the effects found to be statistically significant.

	treatment for long-term sick-listed employees with musculoskeletal pain.		Comparator: ordinary treatment – patients referred back to their GP after visit at outpatient spine clinic.	For patients with good prognosis, extensive multidisciplinary treatment does not result in higher RTW.
Henchoz 2010 [203] [From review by: Kamper 2014]	Functional multidisciplinary rehabilitation (FMR) versus outpatient physiotherapy for non-specific low back pain: randomised controlled trial.	Low back pain (either sub-acute or chronic).	FMR in ambulatory setting, involving: intensive physical and ergonomic training, psychological pain management, back school, instruction in social and work-related issues and a functional evaluation to increase self responsibility. Each patient received individually tailored pharmacotherapy and regular follow-up by a medical doctor. Comparator: outpatient physiotherapy.	Regarding the between group difference for the FMR versus the comparator group in terms of return to full work, the difference was not significant at 6 months (p=0.16), significant at 9 months (p=0.038) and "tended to be significant" at 12 months (p=0.087).
Johansson 1998 [204] [From review by: Meijer 2005]	Effects of a cognitive-behavioural pain-management program.	Chronic musculoskeletal pain which significantly disrupted patients lives.	Cognitive behavioural inpatient program: mostly in group format, involving multidisciplinary team delivering: education sessions, goal setting, graded activity training, exercise and individually tailored muscle training programs, pacing of activities, relaxation, cognitive techniques, social skills training, drug reduction methods, contingent management of pain behaviours and planning of the work return. A meeting with employer, work leader and insurance representative was organised for every patient, plus occupational training. Comparator: waiting list control group.	No significant differences were found regarding sick leave between the groups.
Jousset 2004 [103] [From review by: Desiron 2011, Kamper 2014, Norlund 2009]	Effects of functional restoration versus 3 hours per week physical therapy: a randomized controlled study.	Chronic low back pain.	Functional restoration program: exercises/ aerobic activities, occupational therapy including work simulation, endurance training, balneotherapy, and individual interventions. Comparator: active individual therapy.	A trend towards shorter sick leaves was demonstrated by the functional restoration program; however, this difference (of 20 days) was not statistically significant.

Kool 2007 [104] [From review by: Kamper 2014]	Function-Centered Rehabilitation Increases Work Days in Patients With Nonacute Nonspecific Low Back Pain: 1-Year Results From a Randomized Controlled Trial.	Non-acute non-specific low back pain.	Function-centred treatment: work hardening and functional restoration programs with a multidisciplinary team. Treatment was based on the patient's job demands, revealed in a work-related assessment. Comparator: pain-centred treatment.	The number of work days accounting for time-reduced work was significantly higher in the function-centred rehabilitation group.
Lambeek 2010a [106] [From review by: Desiron 2011, Kamper 2014, Palmer 2012]	Randomised controlled trial of integrated care to reduce disability from chronic low back pain in working and private life	Low back pain > 12 weeks, and were absent or partially absent from work.	Integrated care: workplace intervention based on participatory ergonomics and a graded activity program, given by multidisciplinary team. Comparator: usual care, from range of health professionals.	A significantly shorter RTW was found for the intervention group, with a beneficial effect on disability.
Lambeek 2010b [105] [From review by: Desiron 2011, Kamper 2014, Schaafsma 2013]	Effect of integrated care for sick listed patients with chronic low back pain: economic evaluation alongside a randomised controlled trial	Low back pain > 12 weeks, and were absent or partially absent from work.	Same as above	In terms of return to work, the intervention was found to be cost-effective compared with usual care, and also for QALYs gained.
Lindh 1997 [205] [From review by: Karjalainen 1999, Palmer 2012]	A randomized prospective study of vocational outcome in rehabilitation of patients with non-specific musculoskeletal pain: a multidisciplinary approach to patients identified after 90 days of sick leave.	"Non-specific" diagnoses, i.e. chronic musculoskeletal pain, fibromyalgia, neck and shoulder pain, back pain and similar conditions; reaching a continuous sick leave of 90 days.	Outpatient multidisciplinary rehabilitation: physiotherapy sessions, psychologist sessions with a cognitive behavioural approach, social worker involvement (e.g. family counselling, social support), and intervention from occupational therapist and vocational counseller to offer professional support in patients' contact with employers/organisers of the work, preparations, outlines and follow-ups of vocational training in the workplace. Comparator group description not provided - possibly treatment in primary care.	Note: study presented results according to 'Swedes' and 'immigrants'. Among Swedes, the percentage of work-returners was similar in the long-run (5-years) in the rehabilitation group and control group, although there was a faster initial rate of work return in the control group. This finding was similar for the 'immigrants' group, although there was a lower RTW rate at 5 years for the control group compared to the rehabilitation group.
Marhold 2001 [206]	A cognitive behavioral return-	Women with	Cognitive behavioural treatment:	The number of sick days were

[From review by: Meijer 2005, Palmer 2012]	to-work program: effects on pain patients with a history of long-term versus short-term sick leave.	musculoskeletal pain. One group of patients had a history of long-term sick leave (12 months) at the start of the program and the other had a history of short-term sick leave (2-6 months).	Goal setting (regarding work and leisure time), graded activity and training , pacing of activities; relaxation; cognitive techniques; social skills training; stress management; problem solving; planning of the return to work; how to generalise coping skills to occupational risk factors; handling difficulties at the beginning of return to work; individual maintenance programs. The group also had free access to treatment-as-usual. Comparator: treatment as usual, which did not include cognitive behavioural interventions.	reduced for the intervention group for those on short-term sick leave, but not for those on long-term sick leave.
Meijer 2006 [207] [From review by: Palmer 2012]	Cost-effectiveness of multidisciplinary treatment in sick-listed patients with upper extremity musculoskeletal disorders: a randomized, controlled trial with one-year follow-up.	Non-specific upper extremity musculoskeletal disorders. Employment on a contract of at least 50% of fulltime working hours and sick leave for over 50% of the contractual hours during a period between 4 and 20 weeks.	Multidisciplinary treatment program: return to work sessions; physical sessions aimed at restoring muscle strength and endurance, as well as aerobic fitness, using graded activity training, education, sports activities; psychological sessions aimed at 'demedicalizing'', setting (and achieving) goals and improving coping strategies using cognitive techniques and education. The other psychological session prepared the participants to return-to-work, or to discuss work experiences. A workplace visit could be arranged. Comparator: usual care.	There were no significant differences demonstrated for return to work over time.
Meyer 2005 [208] [From review by Schaafsma 2013]	Feasibility and results of a randomised pilot-study of a work rehabilitation programme.	Individuals with an inability to work due to chronic non-specific pain of more than 3 months with musculoskeletal disorders.	Work rehabilitation program: work-specific exercises, progressive exercise therapy with training devices, education in ergonomics, learning strategies to cope with pain and to increase self-efficacy, a group intervention with the psychologist, sports activities for recreation and a workplace visit to develop appropriate	Improvements overall were seen for the ability to work and work status; however, the differences were not found to be significant between the groups.

			workload-related exercises for the program. Comparator: progressive exercise therapy.	
Mitchell 1994 [209] [From review by: Kamper 2014, Meijer 2005, Palmer 2012, Schaafsma 2013]	The functional restoration approach to the treatment of chronic pain in patients with soft tissue and back injuries.	Injured workers who were experiencing continuing chronic pain from soft tissue or back injuries (who had not recovered within 90 days of injury and remained off work).	Functional restoration program: active exercise program and functional simulation program, with behavioural support; goal setting; occupational gymnasium where undertook tasks commonly required in the workplace; behavioural or psychosocial support. Comparator: control group referred to primary care provider for further treatment supervision.	In terms of the difference in percentage of injured workers in full time work at 12 month follow-up for the intervention vs. control groups, no statistically significant findings were reported. The intervention group had fewer days off work after the injury, on average, than the control group.
Nordstrom-Bjorverud 1998 [115] [From review by: Meijer 2005]	Interdisciplinary rehabilitation of hospital employees with musculoskeletal disorders.	Musculoskeletal pain from the neck/ shoulder region, elbow, thoracic/ lumbar region or pelvic/ hip region, age between 20 and 60 years and consecutive sick-listing for 2 months or repeated sick-listing during the previous 12 months.	Interdisciplinary rehabilitation program: admission as day patients at rehabilitation clinic and contact with/visits to the workplace. Intervention involved the employee, physiotherapist, occupational therapist, workplace supervisors and sometimes workmates. Comparator: received a questionnaire two years after referral to Personnel dept, and a request for a pain drawing.	A significant difference in return to work was demonstrated in favour of the intervention group.
Roche 2007 [107] [From review by: Kamper 2014, Schaafsma 2013] **Roche 2011** [108] [From review by: Kamper 2014]	2007: Comparison of a Functional Restoration Program With Active Individual Physical Therapy for Patients With Chronic Low Back Pain: A Randomized Controlled Trial [6 month results] 2011: Multidisciplinary Intensive Functional Restoration Versus Outpatient Active	Chronic low back pain	Functional restoration program: exercises, work simulations during occupational therapy sessions, clinic visits with specialist in physical medicine and rehabilitation, dietary advice. Comparator: active individual therapy.	RTW improved after treatment at 6-month follow-up. At 12-month follow-up, the number of sick-leave days in the post-treatment year reduced significantly compared with the pre-treatment year. The reduction was higher in the intervention group than in the comparator group ($p<0.001$).

	Physio in Chronic Low Back Pain. [12 month results]			
Skouen[a] **2002** [210] [From review by: Kamper 2014, Meijer 2005, Norlund 2009, Schaafsma 2013]	Relative cost-effectiveness of extensive and light multidisciplinary treatment programs versus treatment as usual for patients with chronic low back pain on long-term sick leave.	Chronic low back pain	Intervention A: light multidisciplinary treatment Intervention B: extensive multidisciplinary treatment, including occasional workplace interventions and education sessions including mental coping strategies applied at work. Comparator: treatment as usual.	Results split according to males and females: male patients return to work more often after light multidisciplinary treatment than the comparator. Female patients do not seem to benefit from either light or multidisciplinary treatment vs. the comparator.
Strand 2001 [211] [From review by: Kamper 2014]	The impact of physical function and pain on work status at 1-year follow-up in patients with back pain.	Patients on long-term sick leave (>8 weeks) due to musculoskeletal pain.	Multidisciplinary rehabilitation program: included physical treatment, education, cognitive and behavioural modification, and workplace-based interventions. Recommendations concerning return to work were not a routine. Comparator: treated in the community and did not follow a pre-defined treatment course.	Fewer participants returned to work fully after one year in the intervention group (47%) compared to the control group (58%); this difference was not statistically significant.

[a] this study includes participants who were part of a larger study by Haldorsen 2002

Section 6: Interventions with evidence of benefit from relevant studies (included systematic reviews)

Table 27: Details of interventions with evidence of benefit featured in relevant studies from the included systematic reviews

Study	Condition	Content of intervention	Duration and timing	Setting	Mode of delivery
Surgical:					
Donceel 1999 [117]	Surgery for herniated lumbar disc	Rehabilitation-oriented approach used by medical advisors to motivate patients and treating physicians towards social and professional reintegration: Medical advisors asked to base medical practice on 3 rehabilitation guidelines. - Contact with patients comprised: consultations, functional evaluation (Oswestry Disability Scale), information about medicolegal aspects, professional rehabilitation measures, natural history and expected work incapacity duration. Also encouragement and stimulation of personal activities, advice on medical advisor's expectations of patients and early recognition of medical and psychosocial stressors leading to enhancement of disability. - Contact with physicians: ask for sufficient and correct information about diagnosis, treatment and further therapeutic planning; encourage professional rehabilitation measures in therapeutic planning; promote a multidisciplinary approach. - Daily contact with colleagues (medical advisors): case discussion. Guidelines that the intervention protocol is based on are referenced in the study.	Patients office visits: first visit at 6 weeks after operation, with monthly follow-up consultations	Office of medical advisors for a social security fund (Belgium)	Face-to-face
Musculoskeletal:					
Allaire 2003 [111]	Rheumatic disease	Job retention vocational rehabilitation intervention consisting of: job accommodation; vocational counselling and guidance; and education and self-advocacy.	Two 1.5 hour sessions of rehabilitation. Most participants completed intervention within 5 months of randomisation, but took longer in a few cases (maximum 9 months).	Local office of state vocational rehabilitation program at participant's home, or in a public area (e.g. library). (Massachusetts)	Face-to-face by rehabilitation counsellors
Arnetz 2003	Musculoskelet	Early workplace intervention comprising a more proactive role for	Within 1 week: visited	Local branch	Face-to-face

[112]	al disorders	insurance case managers and workplace ergonomic interventions (which involved employee, case manager, occupational therapist/ergonomist and employer). An interview was undertaken covering several topics/foci, a workplace visit and vocational training.	local branch of FK for interview. 1 week later: meeting with patient and professionals.	offices of Swedish National Insurance Agency Forsakringskassan (FK) (Sweden)	
Bendix 1996/1998 [101, 102]	Chronic low back pain patients.	Functional restoration intervention: aerobics, weight training, work simulation, work hardening, relaxation, psychological group, stretching, theoretical class, recreation.	All participants were on sick leave at entry to the program. 39 hours per week (i.e. full time) for 3 successive weeks. After graduating from the program, underwent a follow-up program of 6 hours, once a week for 3 weeks.	Copenhagen Back Centre (Denmark)	Face-to-face (training provided in groups of 7 or 8). Group structure essential – each week, 2 or 3 new pts enter the group, and can be inspired by the "third-weekers".
Bultmann 2009 [113]	Musculoskeletal disorders	Coordinated and tailored work rehabilitation intervention, comprising: 1) work disability screening; 2) formulation and implementation of a coordinated, tailored and action-oriented work rehabilitation plan, developed in collaboration by an interdisciplinary team using a feedback guided approach.	The intervention began after 4-12 weeks of sick leave with a systematic work disability screening and identification of barriers for RTW. Screening is 1 week after inclusion (takes 2.5h) plus interdisciplinary team conference (0.5h). Intervention is no longer than 3 months.	Department of development and Labout Market (Denmark)	Face-to-face
Corey 1996 [116]	Soft tissue	Interdisciplinary program emphasising a functional restoration	Participants were	Those receiving	Face-to-face

	injuries (majority related to back pain, and also shoulders, lower extremity, neck and thoracic)	approach to rehabilitation: focus on active physical therapy, work hardening, education in posture and body mechanics, group education and counselling, and active pain management strategies.	referred from 3-6 months post-injury for the program. Treatment sessions were limited to 6.5 hours per day for a maximum of 35 days (average 32.9 days, median 35 days, range 3-35 days).	workers compensation board (Toronto, Canada)	
Durand 2001 [109]	Work-related thoracic or lumbar pain	Therapeutic return to work (TRW): work rehabilitation program is proposed; an agreement between occupational therapist and work supervisor on the expectations of worker; injured worker placed in a supplemental position and helps a co-worker do partial tasks of job; injured worker progressively increases duties.	Intervention was administered at a mean of 7.1 months after back injury.	University hospital based work rehabilitation facility (Quebec, Canada)	Face-to-face
Feuerstein 1993 [110]	Chronic work-related musculoskeletal disorders of the upper extremeties	Multidisciplinary work re-entry rehabilitation program: exercises, physical conditioning, work conditioning/simulation, job-related pain and stress management, ergonomic consultation, and vocational counselling/placement.	Daily treatment over a 4-6 week period, for those work disabled for more than 3 months.	Centre for Occupational Rehabilitation, University of Rochester Medical Centre (USA)	Face-to-face (combination of group and individual sessions)
Haldorsen 2002 [114]	Sick-listed workers with musculoskeletal pain	Intervention A: light multidisciplinary treatment with follow-ups Intervention B: extensive multidisciplinary treatment with follow-ups	A: 1h session plus feedback provided after. A maximum of 12 additional sessions were recommended (on average, received 3 individual follow-ups). B: Program lasted for 4 weeks, with 6h sessions 5 days per week.	Outpatient clinic (Norway)	Face-to-face (combination of group and individual sessions)
Jousset 2004 [103]	Chronic low back pain	Functional restoration program: exercises/ aerobic activities, occupational therapy including work simulation, endurance training,	6 hours a day, 5 days a week, for 5 weeks.	Rehabilitation centres (France)	Face-to-face (group)

		balneotherapy, and individual interventions.			
Kool 2007 [104]	Non-acute non-specific low back pain	Function-centred treatment: work hardening and functional restoration programs with a multidisciplinary team. Treatment was based on the patient's job demands, revealed in a work-related assessment.	4 hours per day for 3 weeks.	Inpatient rehabilitation centre (Switzerland)	Face-to-face
Lambeek 2010a [106]	Low back pain	Integrated care: workplace intervention based on participatory ergonomics and a graded activity program, given by multidisciplinary team.	Integrated care management by clinical occupational physician: from week 1 to full sustainable RTW, or week 12. Workplace intervention: week 3 to week 12. Graded activity: week 2 to full sustainable RTW or after 26 sessions (within maximum 12 weeks).	Primary care and secondary care (UK)	Face-to-face
Lambeek 2010b [105]	Low back pain	Same as above	Same as above	Same as above	Same as above
Nordstrom-Bjorverud 1998 [115]	Musculoskeletal pain from the neck/ shoulder region, elbow, thoracic/ lumbar region or pelvic/ hip region	Interdisciplinary rehabilitation program: admission as day patients at rehabilitation clinic and contact with/visits to the workplace. Intervention involved the employee, physiotherapist, occupational therapist, workplace supervisors and sometimes workmates.	Six weeks admission as "day patients" at rehabilitation clinic, with activity 4 days per week (9am-4pm). Contact with workplace recommended on fifth day. Rehabilitation physician saw patients within 2 weeks after referral and were admitted within 6 weeks.	Rehabilitation clinic and occupational health service unit, at Lund University Hospital (Sweden)	Face-to-face (groups of 3 people)
Roche 2007 [107] Roche 2011	Chronic low back pain	Functional restoration program: exercises, work simulations during occupational therapy sessions, clinic visits with specialist in physical medicine and rehabilitation, dietary advice.	For five weeks, involving 6 hours per day for 5 days a week.	Rehabilitation centres and private	Face-to-face (groups of 6-8 people)

108				ambulatory physiotherapy facilities (France)	

Section 7: Outcome measures in relevant studies from the systematic reviews

Table 28: Outcome measures used in relevant studies from the systematic reviews

	OUTCOMES:					
Study	**Return to work (i.e. non standardised measures)**	**Standardised scales for return to work or return to usual activities or social participation**	**Musculoskeletal symptoms**	**Quality of life**	**Psychological**	**Other**
Surgical studies						
Donceel 1999 [117] **[From review by: Oosterhuis 2014]**	Return to work over 12 month follow-up period					Patterns of practice (study-specific questionnaire)
Musculoskeletal studies						
Allaire 2003 [111] **[From review by: Nevala 2014]**	Time to first job loss (permanent or temporary); time to permanent job loss alone					
Altmaier 1992 [199] **[From review by Meijer 2005, Schaafsma 2013]**	Return to employment (conservative, i.e. full employment at same job; and liberal measures, i.e. if full time on light duties or part-time work or training)		Low Back Pain Rating Scale (Lehmann et al. 1983) to assess disability; McGill Pain Questionnaire (MPQ) (Melzack 1975) for self-reported pain;		Confidence assessed using a 20-item self-efficacy measure & by the 2-item self-control subscale of the West Haven-Yale Multidimensional Pain Inventory (WHYMPI) (Kerns et al. 1985). Negative Mood and Interference	

			OUTCOMES:			
Study	**Return to work (i.e. non standardised measures)**	**Standardised scales for return to work or return to usual activities or social participation**	**Musculoskeletal symptoms**	**Quality of life**	**Psychological**	**Other**
					subscales of the WHYMPI (Kerns et al. 1985)	
Arnetz 2003 [112] **[From review by: Franche 2005, Meijer 2005, Palmer 2012, Kamper 2014]**	Number of sick days (at 6 and 12 months); Working hours of participant	Self-rated health (using 5-graded response scale (Cott et al. 1999))	Musculoskeletal symptoms (rated on 4-point graded scale and Standardized Nordic Questionnaire (Kuorinka et al. 1987))			Cost for purchasing of vocational equipment; Rehab costs (costs for purchase of rehab services); Medical diagnosis
Bendix 1996/ 1998 [101, 102] **[From review by: Kamper 2014, Schaafsma 2013]**	Working or able to return to work/ ability to work (5 categories); Number of sick leave days [outcomes assessed at 12 months]	Function: 15 questions about how much the back problem interfered with activities of daily living (Manniche et al. 1994)	Back pain (NRS scale of 0-10); Leg pain (NRS scale 0-10) (no reference provided, hence assume study specific scales).			Health care utilisation (contacts with health care system, admission to hospital due to LBP, LBP surgery); Medication (amount and type of prescription)
Bendix 1995/ 1998 [101, 200] **[From review by: Kamper 2014, Meijer 2005]**	Working or able to return to work; Days of sick leave.	Function: 15 questions about how much the back problem interfered with activities of daily living (Manniche et al. 1994)	Back pain (NRS scale of 0-10); Leg pain (NRS scale 0-10) (no reference provided, hence assume study specific scales).			Utilisation (contacts with health care system, admission to hospital due to LBP, LBP surgery); Medication (amount and type of prescription

	OUTCOMES:					
Study	**Return to work (i.e. non standardised measures)**	**Standardised scales for return to work or return to usual activities or social participation**	**Musculoskeletal symptoms**	**Quality of life**	**Psychological**	**Other**
						medication)
Bendix 2000 [201] **[From review by: Kamper 2014, Norlund 2009, Scaafsma 2013]**	Work capability (working or able to return to work); Number of sick leave days [measurement at 1 year after treatment]	Assessment for activities of daily living using the Manniche Rating Scale (15 questions) (Manniche et al 1994);	Back pain (NRS of 0-10); Leg pain (NRS of 0-10) (study specific).	Overall assessment of quality of life (1-5) (study specific);		Utilisation (contacts with health care system, admission to hospital due to LBP, LBP surgery)
Bethge 2011 [202] **[From review by: Schaafsma 2013]**	Work status at 6 and 12 months (defined as positive if patient was working and had <6 or <12 (after 12 months) weeks of sick leave.		Pain Management Questionnaire (PMQ) (Geissner 2001);	SF-36 Short Form Health Survey of the Medical Outcomes Study (Ware & Sherbourne 1992)	Hospital Anxiety & Depression Scale (HADS) (Snaith 2003)	
Bultmann 2009 [113] **[From review by: Palmer 2012]**	Cumulative sickness absence hours (from Danish National Health Insurance Service Registry); Work status (RTW, full-time sick leave or part-time sick leave)	Functional disability (using Danish version of Oswestry Low Back Pain Disability Questionnaire, with 10 sections referring to activities of daily living) (Lauridsen et al 2006 (part 1); Lauridsen et al 2006 (part 2))	Pain intensity (by two items from OMPSQ on 10-point rating scale) (Linton & Boersma 2003)			Health care costs
Coole 2013 [119]		Perceived work	Self-efficacy: Pain Self-		HADS to measure	

			OUTCOMES:			
Study	**Return to work (i.e. non standardised measures)**	**Standardised scales for return to work or return to usual activities or social participation**	**Musculoskeletal symptoms**	**Quality of life**	**Psychological**	**Other**
[From review by: Kamper 2014]		ability: one question from Work Ability Index (Tuami et al 1998; Ahlstrom et al 2010), and the Graded Reduced Work Ability Scale (Haldorsen et al 1998). Disability: Roland & Morris Disability Questionnaire (Roland & Morris 1983);	Efficacy Questionnaire (Nicholas 1989). Pain VAS (Jensen & Karoly 2001);		mood (Zigmond & Snaith 1983); Fear avoidance related to work: Fear Avoidance Beliefs Questionnaire – work (Waddell et al 1993).	
Corey 1996 [116] **[From review by: Meijer 2005, Schaafsma 2013]**	Self-reported work status (dichotomous, 2 versions, %). [outcomes assessed at 18 months]		Pain rating (scale 0-10 nonvisual analogue scale (Murphy et al 1988));			Medication use: mean reported narcotic intake (pills/week) Sleep quality rating (scale 1-3) (study specific)
Durand 2001 [109] **[From review by: Carroll 2010, Palmer 2012, Williams 2007]**	Work status (defined as working or not at regular job tasks, assessed using a questionnaire that was constructed)	Spitzer diagnostic scale for classification of workers.	Specific back disability (using Quebec Back Pain Disability questionnaire) (Durand et al 1994, Kopec et al 1995); Pain intensity (using		Fear and Avoidance Beliefs questionnaire (Waddell et al 1993).	

			OUTCOMES:			
Study	**Return to work (i.e. non standardised measures)**	**Standardised scales for return to work or return to usual activities or social participation**	**Musculoskeletal symptoms**	**Quality of life**	**Psychological**	**Other**
			VAS) (Durand et al 1998, Huskisson 1979);			
Feuerstein 1993 [110] **[From review by: Palmer 2012]**	Vocational outcome (employed full-time/ part-time/ actively enrolled in state-supported vocational training/retraining program/ currently unemployed); Duration of work disability (in months, from medical records);	Perception of most recent work environment (using Work Environment Scale) (Moos 1986); Expectation of return to work (VAS, 0-10 rating, completed as part of a Work ReEntry Questionnaire) (Feuerstein & Papciak 1998)	Pain severity (VAS, 0-10 rating) (study specific).		Measures of anxiety; Psychological state and personality style (using Millon Clinical Multiaxial Inventory-II) (Millon 1987); Fear of reinjury (VAS, 0-10 rating) (study specific).	
Haldorsen 1998 [120] **[From review by: Meijer 2005, Palmer 2012]**	Return to work	Subjective work ability (Graded Work Ability scale, GRWA); Daily activities (Norwegian version of the Activity Discomfort Scale (ADS) (Turner & McCreary 1983);	Pain drawing test (Ransford et al 1976, Spangfort 1994); Pain VAS (Carlson 1983)	Health locus of control (measured by Multidimensional Health Locus of Control questionnaire, MHLC – converted to Norwegian (Aaro 1986))	Subjective health (Ursin's Health Inventory, regarding common somatic and psychological complaints) (Ursin et al 1988); Anxiety (Spielberger State Trait anxiety Scale, STAI I-II) (Spielberger 1983	

			OUTCOMES:			
Study	**Return to work (i.e. non standardised measures)**	**Standardised scales for return to work or return to usual activities or social participation**	**Musculoskeletal symptoms**	**Quality of life**	**Psychological**	**Other**
					(Norwegian version – Haseth et al 1990 & 1993); Psychological distress (Hopkins Symptom Check List, HSCL-23) (Derogatis et al 1974), Norwegian version – Central Bureau of Statistics of Norway 1987); Personality (Eysenck Personality Inventory (EPI –Form A) (Eysenck & Eysenck 1964), Norwegian version (Haseth 1969)	
Haldorsen 2002 [114] **[From review by: Meijer 2005, Palmer 2012]**	% returned to work					Economic outcomes – costs and benefits of treatment.
Henchoz 2010 [203] **[From review by: Kamper 2014]**	Work status (% working)	Back-related functional disability: Oswestry Disability Index (Fairbank et al 1980, Fairbank &				Physical assessments: Lifting capacity – Spinal Function Sort (SFS) (Matheson et al

			OUTCOMES:			
Study	**Return to work (i.e. non standardised measures)**	**Standardised scales for return to work or return to usual activities or social participation**	**Musculoskeletal symptoms**	**Quality of life**	**Psychological**	**Other**
		Pynsent 2000).				1989), Progressive Isoinertial Lifting Evaluation (PILE) test (Mayer et al 1988); Lumbar range-of-motion: modified Schober (Williams et al 1993) & fingertip-to-floor tests (Perret et al 2001); Muscle endurance: Shirado & Biering-Sorensen tests (Ito et al 1996, Latimer et al 1999); Aerobic capacity: modified Bruce test (Bruce et al 1973, McInnes et al 1992).
Johansson 1998 [204] **[From review by: Meijer 2005]**	% sick leave; Hours of occupational training per day	Third section of multidimensional pain inventory (MPI) used to measure 'activity grade in the leisure time' (Kerns et al 1985);		Ability to cope with pain (using Coping Strategies Questionnaire, CSQ) (Rosenstiel & Keefe 1983, Jenson & Linton 1993); Daily ratings of pain intensity and interference (using		

			OUTCOMES:			
Study	**Return to work (i.e. non standardised measures)**	**Standardised scales for return to work or return to usual activities or social participation**	**Musculoskeletal symptoms**	**Quality of life**	**Psychological**	**Other**
				VAS) (Wewers & Lowe 1990)		
Jousset 2004 [103] **[From review by: Desiron 2011, Kamper 2014, Norlund 2009]**	% return to work, days off sick leave, ability to work)	Back pain disability: Quebec Disability Scale (Kopec et al 1995);	Pain (VAS) (Huskisson 1982); Quality of life and functional indexes: French version of Dallas Pain Questionnaire (Lawlis et al 1989, Marty et al 1998)		Anxiety/Depression (HAD, Dallas)	Use of prescription medication
Kool 2007 [104] **[From review by: Kamper 2014]**	Return to work, work days (% at work), rate of patients receiving unemployment benefits or permanent disability allowances.		Pain intensity (10-point NRS)			Medication (% taking medication); Health care utilisation.
Lambeek 2010a [106] **[From review by: Desiron 2011, Kamper 2014, Palmer 2012]**	Return to work: duration of time off work (work disability) due to low back pain until full sustainable RTW.	Functional status: Roland Disability Questionnaire (Roland 1983)	Intensity of pain on VAS (Carlsson 1983);			
Lambeek 2010b [105] **[From review by: Desiron**	Return to work (defined as duration of sick leave due to low back pain in			EuroQol EQ-5D (Dutch tariff) to generate quality adjusted life years		Health care resource use.

				OUTCOMES:		
Study	**Return to work (i.e. non standardised measures)**	**Standardised scales for return to work or return to usual activities or social participation**	**Musculoskeletal symptoms**	**Quality of life**	**Psychological**	**Other**
2011, Kamper 2014, Schaafsma 2013]	calendar days from day of randomisation until full RTW in own or other work with equal earnings for at least 4 weeks without recurrence, partial or full. [measured at 3,6, 9 and 12 months]			(Lamers et al 2005)		
Lindh 1997 [205] **[From review by: Karjalainen 1999, Palmer 2012]**	Return to work (i.e. the actual, part-time or full-time return to work during the follow-up period from 90th day of sick leave, regardless of work stability), working status.					
Marhold 2001 [206] **[From review by: Meijer 2005, Palmer 2012]**	Sick leave (number of days on sick leave over periods of 2 months)	Disability Rating Index (DRI) (Salen et al 1994).	Multidimensional Pain Inventory (MPI) (Kerns et al 1985); Pain And Impairment Rating Scale (PAIRS) (Riley et al 1988);	Coping Strategies Questionnaire (CSQ) (Rosenstiel & Keefe 1983);	Beck Depression Inventory (BDI) (Becks et al 1979).	
Meijer 2006 [207] **[From review**	Return to work (defined as mean %		Physical disability (using Dutch version of	Physical functioning (using Dutch version		Complaints assessed as pain and other

	OUTCOMES:					
Study	**Return to work (i.e. non standardised measures)**	**Standardised scales for return to work or return to usual activities or social participation**	**Musculoskeletal symptoms**	**Quality of life**	**Psychological**	**Other**
by: Palmer 2012]	of return to work, where 100 was total return to regular work at the original number of hours. This was based on four questions regarding RTW information).		Disability Arm Shoulder Hand questionnaire (DASH) (Hudak et al 1996); Hand grip strength (using Jamar hand dynamometer) (Sammons Preston, Bollingbrook 2005, Boadella et al 2005); Kinesiphobia (using Dutch version of Tampa Scale for kinesiphobia) (Kori et al 1990, Vlaeyen et al 1995).	of SF-36 Health Survey) (Ware & Sherbourne 1992, Aaronson et al 1998);		complaints; Also cost outcomes (e.g. costs of loss of free time, cost of productivity loss).
Meyer 2005 [208] **[From review by Schaafsma 2013]**	Ability to work in % of a full-time job, and the actual performed work status in % of a full-time job [measured at 8-weeks post-rehabilitation]		Functional capacity, measured by 3 standardised lifting tests; Self-estimation of physical performance using Performance Assessment of Capacity Testing (PACT) (Matheson et al 1993); Perceived pain using NRS; Condition-specific questionnaire: Spinal	SF-36 (Ware et al 1997)		

	OUTCOMES:					
Study	**Return to work (i.e. non standardised measures)**	**Standardised scales for return to work or return to usual activities or social participation**	**Musculoskeletal symptoms**	**Quality of life**	**Psychological**	**Other**
			Function Sort of the North American Spine Society (NASS) (Schochat et al 2000).			
Mitchell 1994 [209] **[From review by: Kamper 2014, Meijer 2005, Palmer 2012, Schaafsma 2013]**	Return to full time work; Days lost from work [measurement at 12 months after treatment]					Cost per workers' compensation claim
Nordstrom-Bjorverud 1998 [115] **[From review by: Meijer 2005]**	% return to work (work status, full-time working, part-time working, or not working, at follow-up)	Physical disability: using Disability Rating Index (Salen et al 1994);	Pain: using VAS (Scott & Huskisson 1976) and pain drawing (Persson & Moritz 1994, Uden et al 1998); Questionnaire regarding working conditions.	Health-related quality of life: using Nottingham Health Profile, NHP (Hunt et al 1980, Hunt et al 1981, Wiklund et al 1988));		Claims for work injury compensation, health insurance status and current health status.
Roche 2007 [107] **[From review by: Kamper 2014, Schaafsma 2013]** Roche 2011 [108]	% self perceived ability to return to work; % return to work; % full-time return to work [measurement		Severity of low back pain on VAS 0-10 (Jensen et al 1986, Huskisson 1982); Dallas Pain Questionnaire – impact of pain on quality of life (Lawlis et al 1989, Marty			Trunk flexibility: fingertip-to-floor distance (Gauvin et al 1990); Trunk muscle endurance: Sorensen test (Biering-Sorensen 1984), Ito

			OUTCOMES:			
Study	**Return to work (i.e. non standardised measures)**	**Standardised scales for return to work or return to usual activities or social participation**	**Musculoskeletal symptoms**	**Quality of life**	**Psychological**	**Other**
[From review by: Kamper 2014]	directly after treatment]		et al 1998).			test (Ito et al 1996); General endurance – by cyclo-ergometer test; Treatment costs.
Skouen 2002 [210] **[From review by: Kamper 2014, Meijer 2005, Norlund 2009, Schaafsma 2013]**	% return to work; information on sick leave status via National Health Insurance [measurement after 12, 18 and 24 months after treatment]					
Strand 2001 [211] **[From review by: Kamper 2014]**	Work (% return to work)	Assessment of perceived functioning (Disability Rating Index) (Salen et al 1994);	Pain: Norwegian Pain Questionnaire (NPQ) (Strand & Wisnes 1991), and VAS (Gracely 1994); Physical performance (5 performance tests used): Pick-up test (Strand & Ljunggren – in press in 2001), Sock test (Strand & Wie 1999), Roll-up test (Sundsvold et al 1982, Sundsvold & Vaglum 1985), Fingertip-to-floor test (Frost et al			

			OUTCOMES:			
Study	**Return to work (i.e. non standardised measures)**	**Standardised scales for return to work or return to usual activities or social participation**	**Musculoskeletal symptoms**	**Quality of life**	**Psychological**	**Other**
			1982), Lift test (Wie 1996).			

Section 8: List of the 140 full text primary studies screened for eligibility

List of included primary studies

Bardgett M, Lally J, Malviya A, et al. Return to work after knee replacement: a qualitative study of patient experiences. *BMJ Open* 2016;6(2):e007912. doi: 10.1136/bmjopen-2015-007912[122]

Donceel P, M. BD, \par DL. Return to work after surgery for lumbar disc herniation - A rehabilitation-oriented approach in insurance medicine\par. *Spine 1999; 24(9 (May 1)): 872-876 \par* 1999[117]

Hinman MR. Factors Influencing Work Disability for Women Who Have Undergone Mastectomy. *Women & Health* 2001;34(2):45-60. doi: 10.1300/J013v34n02_04[123]

Vonk Noordegraaf A, Anema JR, van Mechelen W, et al. A personalised eHealth programme reduces the duration until return to work after gynaecological surgery: results of a multicentre randomised trial. *BJOG : an international journal of obstetrics and gynaecology* 2014;121(9):1127-35; discussion 36. doi: 10.1111/1471-0528.12661 [published Online First: 2014/02/12][124]

List of excluded primary studies

Table 29: Excluded primary studies (from full paper screening)

Focus on Research. Br J Occup Ther 1997;60(2):86-89 [212]	Not occupational advice intervention
Allen L. Embracing a new lifestyle after gastric bypass: a multidisciplinary approach to post-operative exercise program in acute care setting...Combined sections meeting: CSM2007: history repeats itself, Boston, February 14-18. Acute Care Perspectives 2006;15(4):19-20 [213]	No comparator
Aquilina R, Baldacchino D. An exploratory study of Maltese patients' perceptions of their preparation for total joint replacement at the pre-admission clinic. Journal of Orthopaedic Nursing 2007;11(3/4):194-203 [214]	No outcomes of interest
Arthur H, Daniels C, McKelvie R, Hirsh J. Effect of a preoperative intervention on preoperative and postoperative outcomes in low-risk patients awaiting elective coronary artery bypass graft surgery. A randomized, controlled trial. Annals of Internal Medicine. 2000; 133(4): 253-62. [215]	Not occupational advice intervention
Bitterli R, Sieben J, Hartmann M. Pre-surgical sensorimotor training for patients undergoing total hip replacement: A randomised controlled trial. International Journal of Sports Medicine. 2011; 32(9): 725-32. [216]	Not occupational advice intervention
Bondoc S. Rehabilitation of distal radius fractures: a primer for the OT generalist. OT Practice 2005;10(21):17-22[217]	Comparator
Bottomley M. An evidence based evaluation of the types and benefits of total hip replacement preoperative education programs used within Australian health districts...Occupational Therapy Australia, 24th National Conference and Exhibition, 29 June - 1 July 2011. Aust Occup Ther J 2011;58:49-49 doi: 10.1111/j.1440-1630.2011.00937.[218]	Full text unavailable
Budge G. An Evaluation of the Occupational Therapy for Spinal Fusion Hip Spica Patients. Br J Occup Ther 1997;60(8):365-69 [219]	Not occupational advice intervention
Burger H, Marincek C. Return to work after lower limb amputation. Disability & Rehabilitation 2007;29(17):1323-2 [220]	Not occupational advice intervention
Burton JH, Marshall JM, Munro P, Moule W, Snell GI, Westall GP. Rehabilitation and transition after lung transplantation in children. Transplant Proc 2009;41(1):296-9 doi: http://dx.doi.org/10.1016/j.transproceed.2008.10.047.[221]	Study type
Butler GS, Hurley CA, Buchanan KL, Smith-VanHorne J. Prehospital education: effectiveness with total hip replacement surgery patients. Patient Education & Counseling 1996;29(2):189-97 [222]	No outcomes of interest
Chisholm D, Dolhi C, Schreiber J. Creating occupation-based opportunities in a medical model clinical practice setting. OT Practice 2000;5(1):CE-1[223]	No comparator
Clayton M, Verow P. Advice given to patients about return to work and driving following surgery. Occupational Medicine. 2007;57(7):488-91.[52]	No comparator
Cohen M, DiLeonardo M, Zaccariello J. Video education: a new approach to improving patient comprehension. OT Practice 2009;14(16):7-8 [224]	Not occupational advice intervention
Conyers D, Prigge P. The first 12 months after upper-limb amputation. InMotion 2011;21(1):23-24 [225]	Study type
Coudeyre E, Jardin C, Givron P, Ribinik P, Revel M, Rannou F. Could	Not occupational advice

preoperative rehabilitation modify postoperative outcomes after total hip and knee arthroplasty? Elaboration of French clinical practice guidelines. Ann Readapt Med Phys 2007;50(3):189-97 [226]	intervention
Cowie JG, Turnbull GS, Ker AM, Breusch SJ. Return to work and sports after total hip replacement. Archives of orthopaedic and trauma surgery. 2013;133(5):695-700.[39]	Not occupational advice intervention
Criss M, Takacs S. Rehabilitation of Hip Fractures Across the Continuum of Care. Topics in Geriatric Rehabilitation 2013;29(4):281-93 doi: 10.1097/TGR.0b013e318292e904.[227]	Study type
Crowe J, Henderson J. Pre-arthroplasty rehabilitation is effective in reducing hospital stay. Canadian Journal of Occupational Therapy 2003;70(2):88-96 [228]	Not occupational advice intervention
Crum KR. Readiness for discharge: occupation-based treatment in the orthopedic setting. OT Practice 2011;16(14):14-23 [229]	Study type
Dalury DF, Tucker KK, Kelley TC. When can I drive?: brake response times after contemporary total knee arthroplasty. Clin Orthop Relat Res 2011;469(1):82-6 doi: http://dx.doi.org/10.1007/s11999-010-1507-1.[230]	No comparator
Davidson T. Total Hip Replacement: An Audit of the Provision and Use of Equipment. Br J Occup Ther 1999;62(6):283-87 [231]	No outcomes of interest
Dawson-Bowling SJ, Jha S, Chettiar KK, East DJ, Gould GC, Apthorp HD. A multidisciplinary enhanced recovery programme allows discharge within two days of total hip replacement; three- to five-year results of 100 patients. Hip int 2014;24(2):167-74 doi: http://dx.doi.org/10.5301/hipint.5000100.[232]	No comparator
Doe A. HIP REPLACEMENT: WHAT YOU REALLY NEED TO KNOW. Br J Occup Ther 2004;67(5):234-35 [233]	Study type
Donohue K, Hoevenaars R, McEachern J, Zeman E, Mehta S. Home-Based Multidisciplinary Rehabilitation following Hip Fracture Surgery: What Is the Evidence? Rehabilitation Research & Practice 2013:1-10 doi: 2013/875968.[234]	Not for relevant population
Dronkers J, Lamberts H, Reutelingsperger I, et al. Preoperative therapeutic programme for elderly patients scheduled for elective abdominal oncological surgery: a randomized controlled pilot study. Clinical Rehabilitation. 2010; 24(7): 614-22. [235]	Not occupational advice intervention
Drummond A, Coole C, Brewin C, Sinclair E. Hip precautions following primary total hip replacement: a national survey of current occupational therapy practice. Br J Occup Ther 2012;75(4):164-70 doi: 10.4276/030802212x13336366278059.[236]	No outcomes of interest
Drummond A, Edwards C, Coole C, Brewin C. What do we tell patients about elective total hip replacement in the UK? An analysis of patient literature. BMC Musculoskelet Disord 2013;14:152 doi: http://dx.doi.org/10.1186/1471-2474-14-152[237]	No outcomes of interest
Engblom E, Korpilahti K, Hamalainen H, Ronnemaa T. Quality of life and return to work 5 years after coronary artery bypass surgery. Long-term results of cardiac rehabilitation. Journal of Cardiopulmonary Rehabilitation. 1997; 17(1): 29-36. [238]	Not occupational advice intervention
Filiz M, Cakmak A. The effectiveness of exercise programmes after lumbar disc surgery: A randomized controlled study. Clinical Rehabilitation. 2005; 19(1): 4-11. [239]	Not occupational advice intervention
Fletchall S. Occupational therapy from the onset: immediate	Full text not available

therapeutic intervention accelerates recovery for new amputees. InMotion 2006;16(5):34-36.[240]	
Foote JA, Smith HK, Jonas SC, Greenwood R, Weale AE. Return to work following knee arthroplasty. The Knee. 2010;17(1):19-22.[41]	Not occupational advice intervention
Fredericks S, par TY. Educational Intervention Reduces Complications and Rehospitalizations After Heart Surgery. Western Journal of Nursing Research. 2013; 35(10): 1251-1265. [241]	No outcomes of interest
Ganjiwale D, Ganjiwale J. Occupational Therapy Rehabilitation of Post Operative Hand Injury Cases using Modified Low Cost Splints and Home Based Exercises: A Rural Indian Experience. Indian Journal of Physiotherapy & Occupational Therapy 2014;8(3):208-13 doi: 10.5958/0973-5674.2014.00383.9.[242]	Comparator
Gaudry E, Booth J. UsingPparticipatory Action Research (PAR) to develop a 'my trip to hospital' DVD with remote first Australian communities...Occupational Therapy Australia, 24th National Conference and Exhibition, 29 June - 1 July 2011. Aust Occup Ther J 2011;58:11-11 doi: 10.1111/j.1440-1630.2011.00937.x[243]	Not occupational advice intervention
Gignac MA, Badley EM, Lacaille D, Cott CC, Adam P, Anis AH. Managing arthritis and employment: making arthritis-related work changes as a means of adaptation. Arthritis and rheumatism. 2004;51(6):909-16.[10]	Not occupational advice intervention
Gill SD. Does Exercise Reduce Pain and Improve Physical Function Before Hip or Knee Replacement Surgery? A Systematic Review and Meta-Analysis of Randomized Controlled Trials. Archives of Physical Medicine & Rehabilitation. 2013; 94(1): 164-76.[244]	Not occupational advice intervention
Gill SD, McBurney H, Schulz DL. Land-based versus pool-based exercise for people awaiting joint replacement surgery of the hip or knee: results of a randomized controlled trial. Arch Phys Med Rehabil 2009;90(3):388-94 doi: http://dx.doi.org/10.1016/j.apmr.2008.09.561.[245]	Not occupational advice intervention
Gillen G, Berger SM, Lotia S, Morreale J, Siber MI, Trudo WJ. Improving community skills after lower extremity joint replacement. Physical & Occupational Therapy in Geriatrics 2007;25(4):41-54 [246]	Comparator
Giraudet Le Quintrec JS, Coste J, Vastel L, et al. Positive effect of patient education for hip surgery: a randomized trial. Clinical Orthopaedics & Related Research. 2003; 414(): 112-20. [247]	Not occupational advice intervention
Grotle M, Garratt AM, Klokkerud M, Lochting I, Uhlig T, Hagen KB. What's in team rehabilitation care after arthroplasty for osteoarthritis? Results from a multicenter, longitudinal study assessing structure, process, and outcome. Phys Ther 2010;90(1):121-31 doi: http://dx.doi.org/10.2522/ptj.20080295.[248]	Comparator
Guo P. Preoperative education interventions to reduce anxiety and improve recovery among cardiac surgery patients: A review of randomised controlled trials\par. Journal of Clinical Nursing. 2015; 24(1-2): 34-46. \par 2015 [249]	No outcomes of interest
Hagsten B, Svensson O, Gardulf A. Early individualized postoperative occupational therapy training in 100 patients improves ADL after hip fracture: a randomized trial. Acta Orthop Scand 2004;75(2):177-83 [250]	Not occupational advice intervention
Hauer K, Specht N, Schuler M, Bartsch P. Intensive physical training in geriatric patients after severe falls and hip surgery. Age & Ageing. 2002; 31(1): 49-57.[251]	Not occupational advice intervention
Heaton J, McMurray R, Sloper P, Nettleton S. Rehabilitation and total	Not occupational advice

hip replacement: patients' perspectives on provision. Int J Rehabil Res 2000;23(4):253-59 [252]	intervention
Herbold JA, Bonistall K, Blackburn M. Effectiveness of continuous passive motion in an inpatient rehabilitation hospital after total knee replacement: a matched cohort study. Pm R 2012;4(10):719-25 doi: http://dx.doi.org/10.1016/j.pmrj.2012.07.004.[253]	Not occupational advice intervention
Herbold JA, Bonistall K, Walsh MB. Rehabilitation Following Total Knee Replacement, Total Hip Replacement, and Hip Fracture: A Case-Controlled Comparison. Journal of Geriatric Physical Therapy 2011;34(4):155-60 doi: 10.1519/JPT.0b013e318216db81.[254]	Not occupational advice intervention
Hoffmann T, Russell T. Pre-admission orthopaedic occupational therapy home visits conducted using the Internet. Journal of Telemedicine & Telecare 2008;14(2):83-87 [255]	Not occupational advice intervention
Howell SM, Rogers SL. Method for quantifying patient expectations and early recovery after total knee arthroplasty. Orthopedics 2009;32(12):884 doi: http://dx.doi.org/10.3928/01477447-20091020-10.[256]	Not occupational advice intervention
Ibrahim M, Alazzawi S, Nizam I. An evidence-based review of enhanced recovery interventions in knee replacement surgery. Review. Annals of the Royal College of Surgeons of England. 2013; 95(6): 386-9. [257]	Study type
Jame Bozorgi AA, Ghamkhar L, Kahlaee AH, Sabouri H. The Effectiveness of Occupational Therapy Supervised Usage of Adaptive Devices on Functional Outcomes and Independence after Total Hip Replacement in Iranian Elderly: A Randomized Controlled Trial. Occup Ther Int 2016;23(2):143-53 doi: 10.1002/oti.1419.[258]	Not occupational advice intervention
Jepson P, Sands G, Beswick AD, Davis ET, Blom AW, Sackley CM. A feasibility randomised controlled trial of pre-operative occupational therapy to optimise recovery for patients undergoing primary total hip replacement for osteoarthritis (PROOF-THR). Clin Rehabil 2016;30(2):156-66 doi: 10.1177/0269215515576811.[259]	Not occupational advice intervention
Johanson MA, Cohen BA, Snyder KH, McKinley AJ, Scott ML. Outcomes for aging adults following total hip arthroplasty in an acute rehabilitation facility versus a subacute rehabilitation facility: a pilot study [corrected] [published erratum appears in J GERIATR PHYS THER 2009;32(3):110]. Journal of Geriatric Physical Therapy 2009;32(2):29-34 [260]	Not occupational advice intervention
Kaiser GL, Bodell LS, Berger RA. Functional outcomes after arthroplasty of the distal radioulnar joint and hand therapy: a case series. J Hand Ther 2008;21(4):398-409 [261]	Not occupational advice intervention
Kiefer DE, Emery LJ. Functional performance and grip strength after total hip replacement. Occup Ther Health Care 2005;18(4):41-56 [262]	Comparator
Kirk-Sanchez NJ, Roach KE. Relationship between duration of therapy services in a comprehensive rehabilitation program and mobility at discharge in patients with orthopedic problems. Phys Ther 2001;81(3):888-95 [263]	Comparator
Koval KJ, Cooley MR. Clinical pathway after hip fracture. Disability & Rehabilitation 2005;27(18/19):1053-60 [264]	No outcomes of interest
Kuijer PPF, de Beer MJP, Houdijk JHP, Frings-Dresen MHW. Beneficial and limiting factors affecting return to work after total knee and hip arthroplasty: a systematic review. J Occup Rehabil 2009;19(4):375-81 doi: 10.1007/s10926-009-9192-1.[21]	Not occupational advice intervention

Lenze EJ, Munin MC, Quear T, et al. Significance of poor patient participation in physical and occupational therapy for functional outcome and length of stay. Arch Phys Med Rehabil 2004;85(10):1599-601 [265]	Not for relevant population
Lucas B, Cox C, Perry L, Bridges J. Pre-operative preparation of patients for total knee replacement: An action research study. International Journal of Orthopaedic & Trauma Nursing 2013;17(2):79-90 doi: 10.1016/j.ijotn.2012.08.005.[266]	Not occupational advice intervention
MacKay C, Davis AM, Mahomed N, Badley EM. Expanding roles in orthopaedic care: A comparison of physiotherapist and orthopaedic surgeon recommendations for triage. J Eval Clin Pract 2009;15(1):178-83 doi: http://dx.doi.org/10.1111/j.1365-2753.2008.00979.x[267]	Not occupational advice intervention
Maillette PM, Coutu MF, Gaudreault NG. Workers' perspectives on the return to work after total knee arthroplasty. Conference: Work Disability Prevention and Integration (Amsterdam, September 2016). 2016.[268]	Not occupational advice intervention
Mallinson TR, Bateman J, Tseng H-Y, et al. A Comparison of Discharge Functional Status After Rehabilitation in Skilled Nursing, Home Health, and Medical Rehabilitation Settings for Patients After Lower-Extremity Joint Replacement Surgery. Arch Phys Med Rehabil 2011;92(5):712-20 doi: 10.1016/j.apmr.2010.12.007[published Online First: Epub Date].[269]	Not occupational advice intervention
Mata H, Mikkola A, Loveland J, Hallowell PT. Occupational Therapy and Bariatric Surgery. OT Practice 2015;20(1):11-15 [270]	Not occupational advice intervention
McCormick L. The Role of Occupational Therapy in the Adult Bone Marrow Transplant Process. Physical Disabilities Special Interest Section Quarterly 2014;37(4):1-4 [271]	Not for relevant population
McGregor AH, Probyn K, Cro S, et al. Rehabilitation following surgery for lumbar spinal stenosis: a cochrane review. Spine. 2014; 39(13): 1044-1054. [272]	Not occupational advice intervention
McMurray R, Heaton J, Sloper P, Nettleton S. Variations in the Provision of Occupational Therapy for Patients undergoing Primary Elective Total Hip Replacement in the United Kingdom. Br J Occup Ther 2000;63(9):451-55 [273]	Study type
McQuaid L, Cope J, Fenech A. Occupational therapy in orthopaedics: An alternative to hip precautions? International Journal of Therapy & Rehabilitation 2014;21(11):508-10 [274]	No outcomes of interest
McQueen J, Nivison C, Ballance F, Fairbairn P, Clyde D, Murray E. Hip precautions following hemiarthroplasty: a UK study of occupational therapists. International Journal of Therapy & Rehabilitation 2009;16(3):147-53 [275]	Not occupational advice intervention
Merle C, Brendle S, Wang H, Streit MR, Gotterbarm T, Schiltenwolf M. Multidisciplinary treatment in patients with persistent pain following total hip and knee arthroplasty. J Arthroplasty 2014;29(1):28-32 doi: http://dx.doi.org/10.1016/j.arth.2013.05.004.[276]	Comparator
Messecar D. 'Hospital at home' care was generally as effective as routine hospital care for older adults [commentary on Shepperd S, Harwood D, Jenkinson C, et al. Randomised controlled trial comparing hospital at home care with inpatient hospital care. I: three month follow up of health outcomes. BR MED J 1998;316(7147):1786-91 and Shepperd S, Harwood D, Gray A, et al. Randomised controlled trial comparing hospital at home care with inpatient hospital care. II: cost	Not occupational advice intervention

minimisation analysis. BR MED J 1998 Jun 13;316:1791-6]. Evid Based Nurs 1999:50-51 [277]	
Millet R. Occupational therapists set out their stall. Frontline (20454910) 2012;18(21):13-13 [278]	Study type
Miro J, \par RMR. Effects of a brief and economical intervention in preparing patients for surgery: does coping style matter?\par. Pain. 1999; 83(3): 471-5. \par 1999 [279]	Not occupational advice intervention
Mirza SK, Deyo RA, Heagerty PJ, Turner JA, Martin BI, Comstock BA. One-year outcomes of surgical versus nonsurgical treatments for discogenic back pain: A community-based prospective cohort study. Spine Journal 2013;13(11):1421-33 doi: http://dx.doi.org/10.1016/j.spinee.2013.05.047.[280]	Comparator
Moore S. Effects of interventions to promote recovery in coronary artery bypass surgical patients. Journal of Cardiovascular Nursing. 1997; 12(1 (Oct)): 59-70. [281]	Not occupational advice intervention
Mulcahey MJ, Betz RR, Kozin SH, Smith BT, Hutchinson D, Lutz C. Implantation of the FREEHAND SYSTEM during initial rehabilitation using minimally invasive techniques. Spinal Cord 2004;42(3):146-55 [282]	Not occupational advice intervention
Munin MC, Putman K, Hsieh CH, et al. Analysis of rehabilitation activities within skilled nursing and inpatient rehabilitation facilities after hip replacement for acute hip fracture. Am J Phys Med Rehabil 2010;89(7):530-40 doi: http://dx.doi.org/10.1097/PHM.0b013e3181e29f54.[283]	Not occupational advice intervention
Munin MC, Rudy TE, Glynn NW, Crossett LS, Rubash HE. Early inpatient rehabilitation after elective hip and knee arthroplasty. JAMA 1998;279(11):847-52 [284]	Comparator
Naglie G, Tansey C, Kirkland JL, et al. Interdisciplinary inpatient care for elderly people with hip fracture: a randomized controlled trial. CMAJ Canadian Medical Association Journal 2002;167(1):25-32 [285]	Not for relevant population
Naville J, Volz T, Curry J. A multidisciplinary approach to total joint replacement. Home Health Care Management & Practice 2009;21(6):415-18 [286]	Comparator
Nazzal MI, Bashaireh KH, Alomari MA, Nazzal MS, Maayah MF, Mesmar M. Relationship between improvements in physical measures and patient satisfaction in rehabilitation after total knee arthroplasty. Int J Rehabil Res 2012;35(2):94-101 [287]	Comparator
Neville-Smith M, Trujillo L, Ammundson R. Special feature: consistency in postoperative education programs following total hip replacement. Topics in Geriatric Rehabilitation 2000;15(4):68-76 [288]	No outcomes of interest
Newport ML, Tucker RL. New perspectives on extensor tendon repair and implications for rehabilitation. J Hand Ther 2005;18(2):175-81 [289]	Not for relevant population
Nilsson I, Rogmark C. Hemiarthroplasty for displaced femoral neck fracture: good clinical outcome but uneven distribution of occupational therapy. Disability & Rehabilitation 2011;33(23-24):2329-32 doi: http://dx.doi.org/10.3109/09638288.2011.570412.[290]	No outcomes of interest
Novalis SD, Messenger MF, Morris L. Occupational therapy benchmarks within orthopedic (hip) critical pathways. Am J Occup Ther 2000;54(2):155-8 [291]	No absence
Oberg T, Oberg U, Sviden G, Nordwall Persson A. Functional capacity after hip arthroplasty: a comparison between evaluation with three standard instruments and a personal interview. Scand J Occup Ther	Not occupational advice intervention

2005;12(1):18-28 [292]	
O'Brien L, McKeough C, Abbasi R. Pre-surgery education for elective cardiac surgery patients: a survey from the patient's perspective. Aust Occup Ther J 2013;60(6):404-9 doi: http://dx.doi.org/10.1111/1440-1630.12068.[293]	No outcomes of interest
O'Donnell S, Kennedy D, MacLeod AM, Kilroy C, Gollish J. Achieving team consensus on best practice rehabilitation guidelines following primary total hip replacement (THR) surgery. Healthcare Quarterly 2006;9(4):60-64 [294]	Not occupational advice intervention
Oldmeadow, Edwards E, Kimmel L, Kipen E, Robertson V, \par MB. No rest for the wounded: Early ambulation after hip surgery accelerates recovery\par. ANZ Journal of Surgery. 2006; 76(7): 607-611. [295]	Not occupational advice intervention
Oosterhuis T, Costa LO, Maher CG, Vet HCd, Tulder MWv, \par RWO. Rehabilitation after lumbar disc surgery\par. Cochrane Database of Systematic Reviews. 2014; (3): Art. No.: CD003007. DOI: 10.1002/14651858.CD003007.pub3.[169]	Reviewed in Systematic Review library already
Orpen N, Harris J. Patients' perceptions of preoperative home-based occupational therapy and/or physiotherapy interventions prior to total hip replacement. Br J Occup Ther 2010;73(10):461-69 doi: 10.4276/030802210x12865330218267.[296]	No outcomes of interest
Ostelo RWJG, Vet HCWD, Waddell G, Kerckhoffs MR, Leffers P. Rehabilitation following first-time lumbar disc surgery: A systematic review within the framework of the Cochrane collaboration\par. Spine. 2003; 28(3): 209-218.[190]	Reviewed in Systematic Review library already
Pace M, Maguire K. Hand and upper extremity transplantation: a rehabilitation process. OT Practice 2011;16(8):17-22 [297]	Not occupational advice intervention
Peiris CL, Taylor NF, Shields N. Additional Saturday allied health services increase habitual physical activity among patients receiving inpatient rehabilitation for lower limb orthopedic conditions: a randomized controlled trial. Arch Phys Med Rehabil 2012;93(8):1365-70 doi: http://dx.doi.org/10.1016/j.apmr.2012.03.004.[298]	No outcomes of interest
Pfund A, Pütz J, Wendland G, et al. [Coronary intervention and occupational rehabilitation--a prospective, randomized intervention study]. Z Kardiol 2001;90(9):655-60[299]	Full text unavailable
Piva SR, Moore CG, Schneider M, Gil AB, Almeida GJ, Irrgang JJ. A randomized trial to compare exercise treatment methods for patients after total knee replacement: Protocol paper Rehabilitation, physical therapy and occupational health. BMC Musculoskelet Disord 2015;16 (1) (no pagination)(303) doi: http://dx.doi.org/10.1186/s12891-015-0761-5.[300]	Not occupational advice intervention
Pomerance J. Outcomes of carpal tunnel surgery with and without supervised postoperative therapy. Journal Of Hand Surgery. 2007; 32(8): 1159-1163. [301]	Not occupational advice intervention
Poole JL, Walenta MH, Alonzo V, Coe A, Moneim M. A Pilot Study Comparing of Two Therapy Regimens Following Carpometacarpal Joint Arthroplasty. Physical & Occupational Therapy in Geriatrics 2011;29(4):327-36 doi: 10.3109/02703181.2011.613530.[302]	Not occupational advice intervention
Prouty A, Cooper M, Thomas P, et al. Multidisciplinary patient education for total joint replacement surgery patients. Orthop Nurs 2006;25(4):257-61; quiz 62-3 [303]	No outcomes of interest
Provinciali, Giattini A, Splendiani G. Usefulness of hand rehabilitation	Not occupational advice

after carpal tunnel surgery. Muscle & Nerve. 2000; 23(2 (Feb)): 211-6.[304]	intervention
Rannou F, Coudeyre E, Ribinik P, Mace Y, Poiraudeau S, Revel M. Establishing recommendations for physical medicine and rehabilitation: the SOFMER methodology. Ann Readapt Med Phys 2007;50(2):100-10 [305]	Study type
Rapado A. General management of vertebral fractures. Bone 1996;18(3 Suppl):191S-96S	Study type
Ribinik P, Le Moine F, de Korvin G, et al. Physical and Rehabilitation Medicine (PRM) care pathways: "Patients after total knee arthroplasty". Annals of Physical and Rehabilitation Medicine 2012;55(8):533-39 doi: http://dx.doi.org/10.1016/j.rehab.2012.02.001.[306]	Study type
Riddell J. Occupational therapy for adults undergoing total hip replacement. Br J Occup Ther 2013;76(6):291-91 [307]	Study type
Rivard A, Warren S, Voaklander D, Jones A. The efficacy of pre-operative home visits for total hip replacement clients. Canadian Journal of Occupational Therapy - Revue Canadienne d Ergotherapie 2003;70(4):226-32 [308]	No outcomes of interest
Roberts K. Video review. Occupational therapy postoperative management: total hip joint replacement. Aust Occup Ther J 2003;50(3):191-91 [309]	Study type
Roddey TS, Olson SL, Gartsman GM, Hanten WP,. A randomized controlled trial comparing 2 instructional approaches to home exercise instruction following arthroscopic full-thickness rotator cuff repair surgery\par. Journal of Orthopaedic & Sports Physical Therapy. 2002; 32(11): 548-59. [310]	Not occupational advice intervention
Ronco M, Iona L, Fabbro C, Bulfone G. Patient education outcomes in surgery: a systematic review from 2004 to 2010. International Journal of Evidence-Based Healthcare. 2012; 10(4): 309-323. [311]	Not occupational advice intervention
Rucco V, Visentini A, Pellegrini E. The rehabilitation project in hip arthroplasty patients. Eura Medicophys 2003;39(1):45-57 [312]	Study type
Safdar S. Wide-Awake Flexor Tendon Repair. OT Practice 2015;20(8):7-16 [313]	Comparator
Sameem M, Wood T, Ignacy T, Thoma A. A systematic review of rehabilitation protocols after surgical repair of the extensor tendons in zones V-VIII of the hand\par. Journal of Hand Therapy. 2011; 24(4): 365-72; quiz 373. [314]	Not for relevant population
Sandell C. A multidisciplinary assessment and intervention for patients awaiting total hip replacement to improve their quality of life. Journal of Orthopaedic Nursing 2008;12(1):26-34 [315]	Not occupational advice intervention
Sawatzky JAV, Kehler DS, Ready AE, et al. Prehabilitation program for elective coronary artery bypass graft surgery patients: a pilot randomized controlled study\par. Clinical Rehabilitation. 2014; 28(7): 648-657. [316]	Not occupational advice intervention
Schneider M, Kawahara I, Ballantyne G, et al. Predictive factors influencing fast track rehabilitation following primary total hip and knee arthroplasty. Arch Orthop Trauma Surg 2009;129(12):1585-91 doi: http://dx.doi.org/10.1007/s00402-009-0825-9.[317]	No outcomes of interest
Scott PJ. Occupational therapy services to enable liver patients to thrive following transplantation. Occup Ther Health Care	Study type

2011;25(4):240-56 doi: http://dx.doi.org/10.3109/07380577.2011.600427.[318]	
Shahmansouri N, Janghorbani M, Omran AS, et al. Effects of a psychoeducation intervention on fear and anxiety about surgery: Randomized trial in patients undergoing coronary artery bypass grafting. Psychology, Health & Medicine. 2014; 19(4): 375-383. [319]	No outcomes of interest
Sheehan MM, Wilson SF, Vaz AM. Ambulatory rehabilitation for hip and knee arthroplasty. Nursing Monograph 2007:16-19 [320]	Not occupational advice intervention
Shuldham CM, Fleming S. The impact of pre-operative education on recovery following coronary artery bypass surgery. A randomized controlled clinical trial\par. European Heart Journal. 2002; 23(8): 666-74.[321]	Not occupational advice intervention
Siebens HC, Sharkey P, Aronow HU, et al. Variation in Rehabilitation Treatment Patterns for Hip Fracture Treated With Arthroplasty. PM and R 2016;8(3):191-207 doi: http://dx.doi.org/10.1016/j.pmrj.2015.07.005.[322]	Comparator
Smith TO, Jepson P, Beswick A, et al. Assistive devices, hip precautions, environmental modifications and training to prevent dislocation and improve function after hip arthroplasty. Cochrane Database Syst Rev 2016;2016 (7) (no pagination)(CD010815) doi: http://dx.doi.org/10.1002/14651858.CD010815.pub2.[323]	Study type; reviewed in systematic review library already
Spalding N. Health promotion and the role of occupational therapy. British Journal of Therapy & Rehabilitation 1996;3(3):143-47 [324]	No outcomes of interest
Spalding NJ. Reducing anxiety by pre-operative education: make the future familiar. Occup Ther Int 2003;10(4):278-93 [325]	No outcomes of interest
Spalding NJ. Using vignettes to assist reflection within an action research study on a preoperative education programme. Br J Occup Ther 2004;67(9):388-95 [326]	No outcomes of interest
Spalevic M, Lazovic M, Kocic M, Dimitrijevic L, Stankovic I, Savic D. The effects of preoperative physical therapy in total hip replacement surgery...Proceedings of the 10th Congress of the European Federation for Research in Rehabilitation, Riga, Latvia, 09-12 September 2009. Int J Rehabil Res 2009;32:S102-S02[327]	Full text not available
Spiliotopoulou G, Atwal A. Is occupational therapy practice for older adults with lower limb amputations evidence-based? A systematic review. Prosthetics & Orthotics International 2012;36(1):7-14 doi: http://dx.doi.org/10.1177/0309364611428662[328]	No outcomes of interest
Stambough JB, Beaule PE, Nunley RM, Clohisy J. Contemporary Strategies for Rapid Recovery Total Hip Arthroplasty. Instr Course Lect 2016;65:211-24 [329]	Study type
Stinnett KA. Occupational therapy intervention for the geriatric client receiving acute and subacute services following total hip replacement and femoral fracture repair. Topics in Geriatric Rehabilitation 1996:23-31 [330]	Study type
Svendsen SW, Christiansen DH, Haahr JP, Andrea LC, Frost P. Shoulder function and work disability after decompression surgery for subacromial impingement syndrome: a randomised controlled trial of physiotherapy exercises and occupational medical assistance. BMC Musculoskelet Disord 2014;15:215 doi: http://dx.doi.org/10.1186/1471-2474-15-215.[331]	Insufficient information available – protocol only.
Szekeres M, King GJW. Total Elbow Arthroplasty. J Hand Ther	Study type

2006;19(2):245-54 doi: http://dx.doi.org/10.1197/j.jht.2006.02.010.[332]	
Thien T, Becker J. Rehabilitation after surgery for flexor tendon injuries in the hand\par. Cochrane Database of Systematic Reviews. 2004; (4): Art. No.: CD003979. DOI: 10.1002/14651858.CD003979.[333]	Not occupational advice intervention
Tian W, DeJong G, Munin MC, Smout R. Patterns of rehabilitation after hip arthroplasty and the association with outcomes: an episode of care view. Am J Phys Med Rehabil 2010;89(11):905-18 doi: http://dx.doi.org/10.1097/PHM.0b013e3181f1c6d8.[334]	Full text unavailable
Walker J. CARE OF PATIENTS UNDERGOING JOINT REPLACEMENT. Nursing Older People 2012;24(1):14-20 [335]	Study type
Wang X, Emery LJ. Cognitive status after hip replacement. Physical & Occupational Therapy in Geriatrics 2002;21(1):51-64 [336]	Study type
Wasserman BR, Egol KA, Zuckerman JD. Managing hip fractures in older patients: perioperative decision making. Journal of Musculoskeletal Medicine 2008;25(7):326-34 [337]	Study type
Westby MD. Rehabilitation and Total Joint Arthroplasty. Clin Geriatr Med 2012;28(3):489-508 doi: http://dx.doi.org/10.1016/j.cger.2012.05.005.[338]	Study type
Yea-Ing S, Jersey L, Ming-Yueh T, et al. Comprehensive and subacute care interventions improve health-related quality of life for older patients after surgery for hip fracture: A randomised controlled trial\par. International Journal of Nursing Studies. 2013; 50(8): 1013-1024. [339]	Not occupational advice intervention

Section 9: Details of the 4 included primary studies

Table 30: Study characteristics of the included primary studies

Study	Country	Surgery	Design	Number	Intervention(s)	Control
Quantitative:						
Donceel 1999 [117]	Belgium	Herniated lumbar disc	Cluster RCT	345 vs. 365	Rehabilitation-oriented approach focused on early mobilisation and resumption of professional activities	Usual claim-based practice: medical advisors performing their usual medical practice
Vonk Noordegraaf 2014 [124]	Netherlands	Hysterectomy and/or laparoscopic adnexal surgery for benign indication	RCT	110 vs. 105	Personalised eHealth intervention comprising advice and instructions, online feedback from gynaecologist, videos, patient forum, website links and glossary. Involvement from health care professionals and employer.	Control eHealth intervention, plus usual care from gynaecologists, occupational physicians and GPs. Website provided hospital contact numbers and patient leaflets.
Qualitative:						
Bardgett 2016 [122]	England	Total knee replacement (TKR)	Qualitative: interviews	10 patients	Exploration of factors affecting RTW from patient perspective following TKR	NA
Hinman 2001 [123]	Texas, USA	Modified radical mastectomy	Qualitative: surveys and interviews	31 patients, 18 therapists, 5 employers	Exploration of factors influencing work disability following mastectomy, via experiences of advice or education or rehabilitation received regarding RTW.	NA

RCT randomised controlled trial; GPs general practitioners; TKR total knee replacement; RTW return to work; NA not applicable.

Risk of bias assessment for review of primary studies

Table 31: Methodological quality summary of qualitative studies using CASP tool

	Hinman (2001) [123]	**Bardgett et al. (2016)** [122]
1. Was there a clear statement of the aims of the research?	Yes	Yes
2. Is a qualitative methodology appropriate?	Yes	Yes
Is it worth continuing?	Yes	Yes
3. Was the research design appropriate to address the aims of the research?	Yes	Yes
4. Was the recruitment strategy appropriate to the aims of the research?	Yes	Yes
5. Was the data collected in a way that addressed the research issue?	Can't tell	Yes
6. Has the relationship between researcher and participants been adequately considered?	Can't tell	Can't tell
7. Have ethical issues been taken into consideration?	Can't tell	Yes
8. Was the data analysis sufficiently rigorous?	No	Yes
9. Is there a clear statement of findings?	Yes	Yes
10. How valuable is the research?	The study highlights the need for further research and states what the study adds to the existing knowledge on the topic.	Discusses the study findings in relation to existing evidence, and also highlights where there is an absence of evidence in the literature. Suggests improvements in delivery of patient care via a future high quality trial to evaluate the effect on work participation following joint replacement.
Comments	3. Yes, although no clear rationale as to why 'employer group' were interviewed and other groups surveyed. 5. Methods and setting for data collection not justified, form of data is not clear, no discussion of saturation of data (for interviews). 8. No details of analysis of qualitative data provided.	

Table 32: Methodological quality summary for quantitative studies using Cochrane Collaboration's tool

	Donceel 1999 [117]	Vonk Noordegraaf 2014 [124]
Adequate sequence generation?	?	+
Allocation concealment?	?	?
Blinding of participants?	-	+
Blinding of providers?	-	-
Blinding of outcome assessors?	?	-
Incomplete outcome data addressed? (All outcomes – dropouts?)	?	+
Incomplete outcome data addressed? (All outcomes – ITT analysis?)	?	+
Free of selective reporting?	?	+
Similarity of at baseline characteristics?	+	+

Key

+	Low risk of bias
-	High risk of bias
?	Unclear risk of bias

Criteria for Reporting the Development and Evaluation of Complex Interventions in Healthcare, for included primary studies[340]

Donceel 1999[117]		Reported on page or in publication
First stage: Development		
1	Description of the intervention's underlying theoretical basis	No
2	Description of all intervention components, including the reasons for their selection as well as their aims / essential functions	No, p.873 lists intervention components only; no additional detail.
3	Illustration of any intended interactions between different components	No
4	Description and consideration of the context's characteristics in intervention modelling	No
Second stage: Feasibility and piloting		
5	Description of the pilot test and its impact on the definite intervention	No
Third stage: Evaluation		
6	Description of the control condition (comparator) and reasons for the selection	(Yes) p.873 provides brief detail, no reason
7	Description of the strategy for delivering the intervention within the study context	No
8	Description of all materials or tools used delivery the intervention	No
9	Description of fidelity of the delivery process compared the study protocol	No
10	Description of a process evaluation and its underlying theoretical basis	No
11	Description of internal facilitators and barriers potentially influencing the delivery of the intervention as revealed by the process evaluation	No
12	Description of external conditions or factors occurring during the study which might have influenced the delivery of the intervention or mode of action (how it works)	No
13	Description of costs or required resources for the delivery of the intervention	No

Vonk Noordegraaf 2014 [124]		Reported on page or in publication
First stage: Development		
1	Description of the intervention's underlying theoretical basis	No
2	Description of all intervention components, including the reasons for their selection as well as their aims / essential functions	(Yes), p.1128-1129 lists/describes the intervention components. Detailed description of the intervention has been published elsewhere.
3	Illustration of any intended interactions between different components	No
4	Description and consideration of the context's characteristics in intervention modelling	No
Second stage: Feasibility and piloting		
5	Description of the pilot test and its impact on the definite intervention	No
Third stage: Evaluation		
6	Description of the control condition (comparator) and reasons for the selection	(Yes) p.1128, no reason
7	Description of the strategy for delivering the intervention within the study context	Yes, p.1129
8	Description of all materials or tools used delivery the intervention	Yes, p.1129
9	Description of fidelity of the delivery process compared the study protocol	(Yes), p.1129-1130 described compliance
10	Description of a process evaluation and its underlying theoretical basis	No
11	Description of internal facilitators and barriers potentially influencing the delivery of the intervention as revealed by the process evaluation	No
12	Description of external conditions or factors occurring during the study which might have influenced the delivery of the intervention or mode of action (how it works)	Yes, p.1133
13	Description of costs or required resources for the delivery of the intervention	No

Section 10: Intervention characteristics of the included primary studies

Table 33: Intervention characteristics of the included primary studies of surgical populations

Study	Surgery type	Content of intervention	Duration and timing	Setting	Mode of delivery
Donceel 1999 [117]	Lumbar disc herniation surgery.	Rehabilitation-oriented approach used by medical advisors to motivate patients and treating physicians towards social and professional reintegration: Medical advisors asked to base medical practice on 3 rehabilitation guidelines. - Contact with patients comprised: consultations, functional evaluation (Oswestry Disability Scale), information about medicolegal aspects, professional rehabilitation measures, natural history and expected work incapacity duration. Also encouragement and stimulation of personal activities, advice on medical advisor's expectations of patients and early recognition of medical and psychosocial stressors leading to enhancement of disability. - Contact with physicians: ask for sufficient and correct information about diagnosis, treatment and further therapeutic planning; encourage professional rehabilitation measures in therapeutic planning; promote a multidisciplinary approach. - Daily contact with colleagues (medical advisors): case discussion. Guidelines that the intervention protocol is based on are referenced in the study.	Patients office visits: first visit at 6 weeks after operation, with monthly follow-up consultations.	Medical advisors of a social security fund (Belgium)	Face-to-face.
Vonk Noordegraaf 2014 [124]	Hysterectomy and/or laparoscopic adnexal surgery for a benign indication.	Personalised eHealth intervention: Tailored pre- and post-operative instructions regarding resumption of work and daily activities; advice for employer and employee about a successful work reintegration; evaluation of recovery and advice on which care provider/s to approach in case of problems; evaluation of complications, with individualised online feedback if needed; instructional video for employer and employee to illustrate common pitfalls during perioperative and reintegration period; patient forum; website links and glossary; extensive list of answers to frequently asked questions about surgical procedure and practical issues with pictures; involvement from health care professionals and employer. An intervention manual was not reported as being available, although a reference was provided for a more detailed description of the intervention.	Delivered from 4 weeks before surgery to 7 weeks after surgery.	Home-based (Netherlands)	Online, via logging onto website.

Section 11: Data extraction for qualitative studies

Source	
Author:	Bardgett, Lally, Malviya, and Deehan[122]
Year:	2016
Confirm eligibility for review	
Reason:	Qualitative study exploring the patient's perspective regarding return to work after knee replacement surgery
Participants	
Participants:	10 employed patients who had undergone total knee replacement (TKR) and who were all under the age of 60 at the time of surgery
Country:	England
Setting:	Secondary care: large teaching hospital in the north of England.
% male:	50%
Study conducted during:	December 2013-March 2014
Study objective	
Study objective:	To gain a greater insight into the factors influencing return to work from the patient's perspective, potential deficiencies in the delivery of care directly pertinent to return to work, and to identify key themes to inform future research in respect to optimising return to work outcomes. Focus was on the preoperative and early postoperative phases of the patient's journey.
Surgical procedure type	
	Total knee replacement surgery
Method of evaluation and underpinning methodology	
	Participants were selected from a cohort of 50 total knee replacement patients recruited into a population-based postal questionnaire study investigating barriers and facilitators to return to work after joint replacement carried out at the same institution. From the cohort of 50, 37 were in employment preoperatively and consented to be approached. From these, purposive sampling was used to select patients with a range of characteristics known to influence rates of return to work. Using semi-structured interviews, patients were asked to discuss the impact of their knee symptoms and surgery on work participation incorporating both preoperative and postoperative experiences during the interview. Interviews were audio recorded and transcribed verbatim. The process used for analysis was based on thematic analysis as described by Braun and Clarke (2006). Researcher coding was checked by a second experienced qualitative researcher who verified initial codes and subsequent analytical themes to ensure internal validity in relation to the data set. Resulting themes and supporting data were also reported and discussed at regular meetings of the research team as a process of member validation.
Views and experiences (related to return to work/normal activities/social participation)	
	Three themes influencing the patient's experience of return to work following TKR were identified: **Theme 1: delays in surgical intervention (and the impact on work participation preoperatively)** The majority of patients perceived age to be a barrier to referral for surgical intervention for knee OA. Patients described how they used coping mechanisms and adaption to counteract deteriorating physical function and mobility.

	As symptoms persisted and increased in severity, patients discussed the subsequent impact on work participation in terms of reduced productivity in the workplace as well as patients reporting no choice but to take sick leave due to the inability to cope. Patients perceived that their individual circumstances and the need to remain in employment were not given due consideration in the decision-making process. Patients reported the physical and psychological impact of delayed intervention as well as the resulting lost working days, financial implications, and the negative impact on their sickness record and future employability. **Theme 2: limited and inconsistent advice between healthcare providers to optimise return to work** Advice received focused on the elderly, retired population and related to the inpatient episode and immediate post-operative recovery. Longer-term outcomes, such as return to work, were not routinely discussed. Patients stated that preoperative education reinforced the perception of joint replacement surgery as a procedure for the older retired population. Returning to work was not routinely discussed preoperatively. Patients were therefore unsure of the processes involved. They often looked to healthcare professionals postoperatively for guidance. Many patients waited until their routine postoperative hospital review for advice and permission to return to work. When advice was given it did not appear to be tailored to the individual. Generic advice sometimes delayed return to work even when patients felt able to return. Some patients reported their belief that they should not return to work until the clinician gave permission for insurance or health and safety reasons. Patients acknowledged the potential benefits of tailored work-related advice, or the involvement of an occupational health worker to discuss the individual's requirements and facilitate the process of return to work. **Theme 3: the provision of rehabilitation to optimise recovery and return to work** Patients described a large variation in the provision of postoperative rehabilitation. Rehabilitation goals were limited to general mobility and knee range of movement. Patients felt that they would have benefitted from rehabilitation tailored to their individual needs. Although the rehabilitation they did receive was not tailored to their return to work requirements, patients reported that the interaction and feedback they did receive from rehabilitation staff gave them the reassurance and confidence to progress in their physical and psychological recovery. A small number of patients took the decision to seek additional rehabilitation, and reported the positive impact that the rehabilitation had on their physical function and ability to return to work.
Process measures related to delivery of interventions	
Barriers & facilitators:	Facilitators: - Where occupational health team were involved, their role in facilitating how they returned to work was described by patients. - Although most patients stated that they made the decision about when to return to work, they also described how this decision as influenced by the advice from health professionals. Some patients believed they should not return to work until advised for insurance and health and safety reasons.

	- Interaction and feedback received from rehabilitation staff which gave patients the reassurance and confidence to progress in their physical and psychological recovery. - "The majority of patients discussed the potential benefits of more tailored work-related advice, or the involvement of an occupational health worker to discuss the individual's requirements and facilitate the process of return to work." Those that did have an occupational health worker described their role in facilitating how they returned to work, but they did not advise on when they should return to work. - A small number of participants took the decision to seek additional rehabilitation, and reported the positive impact of this on their physical function and ability to return to work. - Patients reported that the advice they received from health professionals focussed on the needs of the elderly retired population. Barriers: - The topic of duration of absence due to sickness and return to work not being routinely discussed preoperatively. - Preoperative education focussed on the inpatient stay and immediate postoperative period but longer-term outcomes such as return to work were not routinely discussed. - "Patients perceived that their individual circumstances and the need to remain in employment were not given due consideration in the decision-making process." i.e. the advice not being tailored to the individual. - Age was perceived by patients to be a major barrier to referral for surgical intervention for knee osteoarthritis. Surgery was delayed due to age influencing the treatment options available, with frustrations around being told that they were too young to have a joint replacement. - "Patients described that rehabilitation was limited to the needs of the elderly population, and their individual requirements and circumstances for return to work were not considered."
Stakeholder perspectives (patients, healthcare professionals,employers):	The patient's perspectives are presented in the study; it does not report the perspectives of the healthcare professional or the employer but does identify their involvement in the process.

Source	
Author:	Hinman[123]
Year:	2001
Confirm eligibility for review	
Reason:	Qualitative study exploring the work status, rehabilitation practices and barriers to work re-entry for mastectomy patients, from perspective of the patient, occupational therapist and employer.
Participants	
Participants:	31 patients who were post-modified radical mastectomy, 18 physical/occupational therapists working in cancer centres, and 5 employers who represented a diverse group of businesses.
Country:	Texas, USA
Setting:	Cancer centre at University of Texas (patients), rehabilitation medical centres specialising in cancer care (therapists), and public/private companies and businesses
Study conducted during:	located in East and Southeast Texas (employers)
Study objective	
Study objective:	To describe and examine the relationship between the factors that interfere with women's ability to return to work from the perspectives of patients, therapists, and employers.
Surgical procedure type	
	Modified radical mastectomy (MRM) surgery
Method of evaluation and underpinning methodology	
	Survey methods were used to solicit information from three independent sources including: 1) Women who had undergone MRM surgery; 2) Physical and occupational therapists who commonly treat these patients; 3) A diverse group of employers. Quantitative and qualitative data were collected from each group of participants. Patients: A survey of ten items related to patient's cancer diagnosis, surgery and rehabilitation, pre- and post-operative work status, was mailed out to patients. The survey included items related to patient demographics, pre and post-operative employment status, length of hospital stay, type and length of post-operative rehabilitation program (if any) and whether the physical requirements of their job were addressed in their rehabilitation. Physical and occupational therapists: A survey consisting of ten items related to their own clinical experience, number of referrals received in previous year for post-MRM patients, types of physical impairments frequently demonstrated by these patients, work-related treatment goals, types of therapeutic interventions used, and average length of rehabilitation program. Employers: Personal interviews structured around an established list of seven open-ended questions addressing their past experiences with employees who had undergone mastectomy surgery. Common factors that affect a woman's ability to return to work following MRM surgery were identified and classified as either physical limitations, psychological

	limitations, or both.
Views and experiences (related to return to work/normal activities/social participation)	
	The patients' responses did not reference interventions relating to occupational advice. They referred more to information regarding exercises/physical job requirements. The only references to occupation were: • "only one patient reported that she had been asked about the physical requirements of her job" • "many women described specific physical impairments that interfered with their ability to work" • "only the comments from two women hinted at any job discrimination, and one of these clearly had physical limitations". Therapists' responses covered topics such as the timing of referrals to therapy, descriptions of a typical treatment program and the proportion achieving their treatment goals. All interviewed employers reported having written policies or procedures that would allow employees to return to work following MRM surgery. The paper references accommodations such as changing work schedule, modifying job role, job reassignment, assistive devices and ergonomic changes to work stations). "All of the businesses reported that guidelines for the employee's return to work and information regarding the employee's work abilities or post-operative restrictions were determined by written documentation from the employee's physician."
Process measures related to delivery of interventions	
Barriers & facilitators:	*Facilitators:* When asked what health care professionals could do to facilitate an employee's return to work following MRM surgery, employers' requests included: 1) Appropriate and specific information to employers about the employee's physical restrictions 2) Better patient education regarding the expectations for recovery and the rehabilitation process 3) Counselling services 4) Better timing of clinic appointments (for follow-up treatment) to cause less disruption of work schedules. Barriers: Only a small percentage of the women who had MRM surgery were referred to physical therapy or were visited by a recovery volunteer. *Barriers: perceived barriers to work re-entry and recommendations:* "A common theme that surfaced from all three groups was their perceived dependence on physicians to direct the recovery process." "Based upon the comments of the patients - **patient education is often insufficient"** There were three reasons for this

	1) Timing of information is important and information related to employment is not as useful if it is delivered 1-2 days after surgery 2) Information providedcan be difficult to understand or remember. Consideration should be given to how information is presented 3) Patients are often not given information and responsibility for this could be delegated from doctors to other HCPs. **"**Rehabilitation programs should focus on prophylactic interventions to minimize physical impairments and functional training to facilitate work reintegration." A further potential barrier is the timing of referrals to therapy. In some cases referral was not routine and was only instigated 'when patients got into trouble'.

Appendix 3: Supporting information for the cohort study, health economic analysis and national survey of practice (IM stage 1)

Section 1: Patient information sheet for OPAL cohort study (Contact details removed)

OPAL PHASE 1 - PARTICIPANT INFORMATION SHEET

We would like to invite you to take part in a research study aimed at helping people return to work following their hip or knee replacement surgery.

As part of this study we are interested in collecting information from you and hearing your views and experiences about your recovery and return to work following your joint replacement.

Before you decide whether to take part in the research study, it is important for you to understand why this is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Please feel free to ask us if there is anything you are not sure about.

Why are we doing this research study?
Hip and knee arthritis causes pain that limits physical function and can affect ability to work. Hip and knee replacements are proven to relieve pain and improve function, and can help many patients of working age to continue working or get back to work.

However, currently there is much we do not know about patients returning to usual activities and work following hip and knee replacement. We therefore need to better understand what is currently being done and how we might improve current care. Once we understand the issues patients have when returning to work after hip and knee replacement we will develop advice to help people return work. This advice will be in the form of a manual that will provide support to help patients return to usual activities including work following their operation.

How long will the study last?
This research has two separate parts and will take 27 months overall - however you will not be involved for the whole study.

The first part will collect information about work roles and return to work from a variety of sources including patients using questionnaires and interviews and will run during the first 12 months of the study. In the second part we will use this information to develop the manual to help patients return to usual activities including work. We are currently inviting patients to help us with the first part of the study (questionnaires and interviews) but may later contact you again to request your help with the second part of the study.

Why have I been invited?
You have been invited because you are about to receive or have recently had a hip or knee replacement at one of the hospitals participating in this research. You have also been in work at some point during the last 6 months.

Why are we performing questionnaires and interviews?
The purpose of these is to gather information about your general health, employment and work. Information is also requested about when and how you return to work after your operation or, for those patients that do not return to work, why this was. By collecting this information we will be able to understand what issues prevent people returning to work after their operation. All patients

who agree to take part will complete questionnaires but only some will be asked to undertake an interview.

What will happen to me if I take part in the questionnaires and interviews?
If you decide to take part in the questionnaire part of the study, you will be asked to complete the initial questionnaire while in hospital and then follow up questionnaires at 8 & 16 weeks after your operation. Some patients will also receive a follow up questionnaire at 24 weeks. These questionnaires can be completed either at the hospital if you have a hospital visit or they can be sent to you by post. You will be contacted about completing these questionnaires by a member of the research team. If necessary they can also be completed over the telephone. Questionnaires will take approximately 30-40 minutes of your time to complete at each time point.

If you also agree to take part in the interview part of the study, we will send your contact details to researchers from the University of Nottingham. They will contact you to arrange an interview to discuss in greater detail the work you do, and what advice and support you received to help you return to work and your usual activities following your surgery. The interview will last approximately 30 minutes and can be completed face-to-face or via telephone, at a time that suits you. The face-to-face interview can be conducted either at your local hospital or another agreed place. The interview will be audio recorded, with your consent, and transcribed but personally identifiable information, such as your name, will be removed.

Will you be interviewing anyone else?
Yes, in order to gain a complete picture about how and when patients return to work, we need to interview other people involved in their care. We therefore plan to interview a variety of different people including surgeons, General Practitioners, physiotherapists, occupational therapists, employers and workplace representatives. Some of the healthcare professionals interviewed may be those involved in your care. However, we will not be interviewing your employer or workplace representative.

Do I have to take part and allow you to contact my workplace representative?
It is up to you to decide whether or not you wish to take part in the study and in which parts of the study you would like to participate. In summary there are 2 key elements that we are asking patients to help with:

- Questionnaire completion
- Participating in an interviews

You have some time to think about taking part in this research study and do not need to decide straight away. A member of the research team will contact you to ask you which parts of the study, if any, you might like to be involved in. They will also be able to answer any further questions you may have. If you do want to take part you will be asked to sign a consent form. Different options are available on the consent form reflecting the different elements of the study that we need help with (listed above).

What are the possible disadvantages and risks of participating?
There are no particular risks associated with this study. We appreciate that taking part will involve your time.

What are the possible benefits of taking part? [341]
There may be no direct benefit to you. However, the information we collect from the study will help us understand patients' experiences of the support and advice they receive and will identify improvements that might be made in the future. Participants will be helping to shape and improve advice for those patients hoping to return to work after hip or knee replacement in the future.

Will it cost me anything to take part?
It will not cost you anything to take part in the study. We will provide paid return mail envelopes for the questionnaires if they are being completed by post. The interview will take place at your home, at your local hospital or by telephone, whichever is easiest for you. Any travel expenses will be reimbursed.

Will the information I provide be kept confidential?
Yes, we will follow established ethical and legal practices, and all information collected about you during the course of the study will be kept strictly confidential. Some parts of the data collected for the study will be looked at by authorised persons from the research team who are organising the research. They may also be looked at by authorised people to check that the study is being carried out correctly. All will have a duty of confidentiality to you.

Any information we collect about you will be stored in a secure location and electronically on a password protected database. We will store personal contact information, such as your name, address and telephone number, so we are able to contact you about the study; as well as your NHS number. This information will be held in a separate file from the questionnaires and interview recordings/transcripts. Some of the questionnaires may ask for your age, gender, date of surgery, and the first part of your postcode as we need to collect this information for the study. Any other information about you which leaves the hospital will have your name and address removed (anonymised) and a unique code will be used to help protect your identity.

Your personal data (address, telephone number) will be retained after the end of the study for up to three years, in the event that we need to contact you about the findings of the study (unless you advise us that you do not wish to be contacted). Only members of the research team (University of York & University of Nottingham, the Sponsor (South Tees Hospitals NHS Foundation Trust) and the NHS Trust) will have access to your personal data. We will ask for your consent to link the data collected from the study to routinely collected health data stored in national databases (via your NHS number), and to share this information anonymously with other researchers. Your personal details will not be provided to anyone else, or used for any other purpose.

Your personal data will be disposed of securely after it is no longer necessary to contact you. All other research data will be stored securely for seven years, and after this time will also be disposed of securely. During this time all precautions will be taken by all those involved to maintain your confidentiality. However, if you make a disclosure to a member of the research staff, which makes them seriously concerned about you or someone else's safety or well-being, then the researcher is obliged to break confidentiality in accordance with the Human Rights Act 1998.

What if there is a problem?
If you have any concerns or questions about any aspect of this study, you should ask to speak to the researchers (their contact details are at the bottom of this sheet), who will do their best to answer your questions. If you would like to speak to someone outside the research team, you can do this by contacting the Sponsor: XXXXXXX, Tel: XXXXXXX or Email: XXXXXXX@XXXXXXX

If you remain unhappy and wish to complain formally, you can do this through the National Health Service complaints mechanism by contacting the Patient Advice and Liaison Services (PALS) officer at your hospital on free phone XXXXXXX.

What will happen if I don't want to carry on with the study?
Your participation is voluntary and you are free to withdraw your participation (fully or partly) or permission to contact your employer or workplace representative at any time, without giving any

reason. This will not affect your working and legal rights. If you withdraw, then the information collected so far cannot be erased and this information may still be used in the project analysis.

What will happen to the results of the research study?

The results of the study may be presented to other researchers, at conferences and through publication in scientific journals. Results of the study may also be used to support other research in the future, and may be shared anonymously with other researchers. As requested by the funder (the HTA), we would like your permission to link the data collected during this study to the routinely collected health data stored in national databases in future, although this activity does not form part of this research project. We will ensure that it will not be possible for anyone to identify you from the published findings of the study. If you wish to know the results of the study, we will send you a summary of the findings.

Who is organising and funding the research?

The research is organised by South Tees Hospitals NHS Foundation Trust in Middlesbrough in collaboration with the University of Nottingham and the University of York. The research is funded through the National Institute of Health Research, Health Technology Assessment Programme.

Who has reviewed the study?

All research in the NHS is reviewed by an independent group of people, called a Research Ethics Committee, to protect your interests. This study has been reviewed and given favourable opinion by the XXXXXXX ethics committee.

What should I do now?

Please think about whether or not you would like to take part in the study and in which parts of the study you wish to be involved with – these are the questionnaire study and the interview. If you would like to take part please complete the consent form and either return it to one of our research nurses or send it back to us in the freepost envelope provided. A member of the research team will then contact you about the parts of the study you have agreed to help us with.

Please ask a member of the research team if there is anything that is not clear, or if you would like more information.
Principal Investigator: XXXXXXX Tel: XXXXXXX
Research Associate/ Nurse: XXXXXXX Tel: XXXXXXX

Further information and contact details: XXXXXXX

Thank you for taking the time to read this information sheet and to consider this study.

Section 2: Supplementary information for cohort study analyses

Table 34: List of jobs given by participants in the cohort study, 145 responses

Petrol Station Operative
Technical Sales Engineer
Medical Secretary on a Neo Natal Unit
Dog Walker, Pet Sitter
I.T. Manager, manage I.T. Engineers
Staff Nurse Trauma Orthopaedics - Rehab
General Practitioner
Mould tool maintenance. Toolmaker. Tooling engineer.
Non-professional fiction writer.
Volunteer Worker in my local Hospital Outpatient Receptionist
Engine technician,
Mechanical Maintenance Fitter
Hairdresser
Volunteer- Arches Project Nottingham.
Train Cleaner,
Proprietor & Head Groomer at my Salon
I am a teaching assistant in a special needs school covering a wide range of needs physically and mentally.
Tree surgery/ groundsman
Charity shop volunteer
Admin or reception work on a temporary basis
Tax manager in chartered accountants
HCA, NHS Medium Secure Unit
work on Till, also self-scan
I run a Headhunting company
Carpenter
Senior Supervisor in Production/Manufacturing supplements for human & animal welfare.
Social Worker in the community
Assistant Practitioner
Bindery guillotine operator
I am a volunteer supervisor in a charity shop.
Builder: extensions, roofs, patios.
Work in family business.
I am a cleaner at our fun house.
porter nights
shop fitter
I do catering assistance in primary school serving pupils at lunch time.
admin / data input officer and telephone agent
Administration officer with HMRC.
teaching assistant
Warranty administrator in car dealership.
Volunteer in church shop. General shop work duties.
GP receptionist. Admin work and support worker at homeless hostel.
Security consultant.
Assistant health visitor practitioner.
I have my own joinery business
Social worker/ best interests assessor.

admin team leader organising staff, computer work
Manager curtain maker and designing and making curtains.
I work at the local council as a supervisor mechanic
We have a farm and pony trekking centre.
Passenger assistant, a travel buddy to people young and old with complex needs.
I am a courier driver
Pig farmer
Company Director
LGV Driver - Farm work
I work at bus depot, as a diesel fitter.
Lunchtime supervisor
Construction manager
Technical author
Staff nurse
Retired - But still working farmer.
Motor mechanic / Wagon driver.
Post man
Plant operator, surface mines
Taxi Driver, Long periods of sitting.
Minister of religion. Run children and youth clubs. Preach. Lead bible studies.
Cleaner
Gamekeeper
I am retired, I look after my grandma one day a week and i help my daughter with her homes 5 days a week.
Account work - Working part time at home, working from a desk or table.
Ordained curate
Clean and take in main meal (career)
I work for council, as part of the reablement team
Take orders; check stock, re plan units. Merchandise stock.
Primary School Teacher
I worked as a Customer Service Officer
Test & Development Engineer. / Computer/desk and factory floor based
Mechanical Engineer Building Services
Warehouse Worker
Motor Engineer
Personnel Assistant
Flooring Contractor
Lecturer in business studies & accounting
Civilian medical practitioner at RAF
Sole trader of fruit and veg boxes
I am a retired engineer, I now work as a hobby
Street cleaner for council.
Post office counter clerk.
Chef.
2 voluntary jobs
Postman
Retired, but work a couple of days a week looking after a few properties I own.
Printer/pre-press.
Director of a plastering and property company
I arrange busking groups to raise money for different charities.

Pall bearer
partner in newspaper distribution business
Litho Printer Operating Printing Press
company director - managerial
Floor porter
Pick up furniture and delivering to homes..
Speech language and communications needs consultant.
delivery driver
I am a transport officer working for council.
Joiner.
rigger off shore wind turbines and heavy lifting
care worker
manager
NHS podiatrist
sole proprietor of a 4 roomed b and b.
security guard
police staff
garage owner, car repairs and mot
Parra planner.
bed and breakfast owner
Monumental sculptor.
quality control inspector
I'm a joiner by trade.
racecourse judges assistant
Desk Job computer work
heating engineer
Electrician
Butcher intake and outtake manager
garage prop
Practice Nurse
Technical Assistant.
Teaching electrical commercial courses.
Bricklayer and building contractor.
Farmer
Maintenance engineer.
Medical secretary/Medication dispenser in an NHS GP surgery
Carer
Retired/Self-employed architect
Taxi driver / LGVI driver
Maintenance Gearbox Oil/ F.L.T
Sales and market development director.
I am a farmer.
Assistant manager, cancer research shop.
Volunteer driver for ambulance service.
Clinical specialist nurse for discharges & palliative discharge
Full time carer for wife at home.
Customer assistant.
Domestic cleaner.
Self-employed builder
Reablement

Table 35: Baseline health measures (PHQ-9, GAD-2, OH/KS and BRS) for the cohort, detailed by operation type and overall.

	Hip (n=77)	Knee (n=77)	Total (n=154)
PHQ-9, raw scores	N=73	N=74	N=147
Mean (SD)	5.9 (5.5)	4.9 (5.4)	5.4 (5.5)
Median (Q1, Q3)	5 (2, 9)	3 (1, 7)	4 (1, 8
(min, max)	(0, 24)	(0, 24)	(0, 24)
PHQ-9, categorised	N=77	N=77	N=154
None (0-4)	34 (44.2)	44 (57.1)	78 (50.7)
Mild (5-9)	21 (27.3)	18 (23.4)	39 (25.3)
Moderate (10-14)	13 (16.9)	4 (5.2)	17 (11.0)
Moderately severe (15-19)	3 (3.9)	7 (9.1)	10 (6.5)
Serve (20-27)	2 (2.6)	1 (1.3)	3 (2.0)
Missing	4 (5.2)	3 (3.9)	7 (4.6)
GAD-2			
In the past two weeks how often have you been bothered by:			
Feeling nervous, anxious or on edge? n(%)	N=77	N=77	N=154
Not at all	40 (52.0)	44 (57.1)	84 (54.6)
Several days	27 (35.1)	25 (32.5)	52 (33.8)
More than half the days	6 (7.8)	2 (2.6)	8 (5.2)
Nearly every day	1 (1.3)	3 (3.9)	4 (2.6)
Missing	3 (3.9)	3 (3.9)	6 (3.9)
Not being able to stop or control worrying? n(%)			
Not at all	47 (61.0)	50 (64.9)	97 (63.0)
Several days	20 (26.0)	16 (20.8)	36 (23.4)
More than half the days	5 (6.5)	5 (6.5)	10 (6.5)
Nearly every day	2 (2.6)	3 (3.9)	5 (3.3)
Missing	3 (3.9)	3 (3.9)	6 (3.9)
BRS, raw score	N=75	N=73	N=148
Mean (SD)	3.04 (0.38)	3.03 (0.50)	3.03 (0.44)
Median (Q1, Q3)	3 (2.8, 3.2)	3 (2.8, 3.2)	3 (2.8, 3.2
(min, max)	(1, 4.3)	(1.3, 5)	(1, 5)
BRS, categorised	N=77	N=77	N=154
Low (1.0 – 2.99)	19 (24.7)	21 (27.3)	40 (26.0)
Normal (3.0 – 4.3)	55 (71.4)	51 (66.2)	106 (68.8)
High (4.31 – 5)	1 (1.3)	0 (0.0)	1 (0.7)
Missing	2 (2.6)	5 (6.5)	7 (4.6)

Oxford hip/knee score, raw score	N=74	N=74	N=148
Mean (SD)	19.2 (7.3)	20.9 (7.5)	20.1 (7.4)
Median (Q1, Q3)	18.5 (15, 23)	20 (15, 27)	19 (15, 25)
(min, max)	(6, 44)	(8, 44)	(6, 44)
Oxford hip/knee score, categorised	N=77	N=77	N=154
Satisfactory (40 - 48)	1 (1.3)	1 (1.3)	2 (1.3)
Mild to Moderate (30 - 39)	4 (5.2)	8 (10.4)	12 (7.8)
Moderate to Severe (20 - 29)	28 (36.4)	30 (39.0)	58 (37.7)
Severe (0 - 19)	41 (53.3)	35 (45.5)	76 (49.4)
Missing	3 (3.9	3 (3.9)	6 (3.9)

Table 36: Details on the cohort participants work habits pre-surgery, by type of operation and overall information provided at baseline

	Hip (n=77)	**Knee (n=77)**	**Total (n=154)**
Were you working in your usual role right up to your last day at work before your operation? n(%)			
Yes	66 (85.7)	66 (85.7)	132 (85.7)
No	9 (11.7)	9 (11.7)	18 (11.7)
Missing	2 (2.6)	2 (2.6)	4 (2.6)
If no: Which of the following options best describes how you have been working prior to your surgery? n(%)	N=9	N=9	N=18
Reduced hours, usual duties	2 (22.2)	3 (33.3)	5 (27.8)
Usual hours, amended duties	4 (44.4)	5 (55.6)	9 (0.5)
Reduced hours and amended duties	2 (22.2)	0 (0.0)	2 (11.1)
Missing	1 (11.1)	1 (11.1)	2 (11.1)
If no & you were working reduced hours: How many hours per week were you working?	N=4	N=3	N=7
Mean (SD)	37.5 (10.4)	20 (10)	30 (13.2)
Median (Q1, Q3)	37.5 (30, 45)	20 (10, 30)	30 (20, 40)
(min, max)	(25, 50)	(10, 30)	(10, 50)
If no & you were working reduced hours: For how many weeks had you been working reduced hours?	N=4	N=3	N=7
Mean (SD)	16.3 (26.5)	19.3 (26.7)	17.6 (24.3)
Median (Q1, Q3)	3.5 (2.5, 30)	7 (1, 50)	4 (2, 50)
(min, max)	(2, 56)	(1, 50)	(1, 56)
If no & you were working on amended duties before you left work: For how many weeks had you been working on amended duties?	N=5	N=3	N=8
Mean (SD)	4 (4.7)	10.7 (7.1)	6.5 (6.2)
Median (Q1, Q3)	2 (2, 4)	12 (3, 17)	3.5 (2, 12)
(min, max)	(0, 12)	(3,17)	(0, 17)

Have you had any periods of sick leave in the 6 months prior to your operation? n(%)			
Yes	26 (33.8)	15 (19.5)	41 (26.6)
No	43 (55.8)	46 (59.7)	89 (57.8)
Missing	8 (10.4)	16 (20.8)	24 (15.6)
If yes: How many separate periods of sick leave have you had because of the joint that requires surgery?	N=25	N=14	N=39
Mean (SD)	5.2 (15.7)	2.6 (3.2)	4.3 (12.7)
Median (Q1, Q3)	2 (0, 3)	2 (0. 4)	2 (0, 3)
(min, max)	(0, 80)	(0, 12)	(0, 80)
How many separate periods of sick leave have you had for other reasons?	N=23	N=14	N=37
Mean (SD)	2.1 (4.5)	1 (0.7)	1.7 (3.6)
Median (Q1, Q3)	1 (0, 2)	1 (1, 1)	1 (0, 2)
(min, max)	(0, 20)	(0,20)	(0, 20)
Approximately how many days work have you missed in the last 6 months because of the joint that requires replacement surgery?	N=22	N=13	N=35
Mean (SD)	16.5 (24.9)	7.3 (6.7)	13.1 (20.4)
Median (Q1, Q3)	6 (0, 28)	6 (2, 13)	6 (0, 15)
(min, max)	(0, 90)	(0, 20)	(0, 90)
Approximately how many days work have you missed in the last 6 months because of other reasons?	N=22	N=14	N=36
Mean (SD)	6.0 (13.8)	2.2 (3.9)	4.6 (11.1)
Median (Q1, Q3)	1 (0, 3)	0 (0, 3)	0.5 (0, 3)
(min, max)	(0, 60)	(0, 12)	(0, 60)

Is there a sickness absence policy in your place of work? n(%)			
Yes	34 (44.2)	38 (49.4)	72 (46.8)
No	18 (23.4)	16 (20.8)	34 (22.1)
Unsure/Don't know	13 (16.9)	9 (11.7)	22 (14.3)
Missing	12 (15.6)	14 (18.2)	26 (16.9)
Do you receive any of the following payments during periods of sick leave?[a] n(%)			
Statutory sick pay	18 (23.4)	20 (26.0)	38 (24.7)
Employer based sick pay	21 (27.3)	18 (23.4)	39 (25.3)
Don't know/ Unsure	15 (19.5)	13 (16.9)	28 (18.2)
If you do receive sickness payments, for how long do you receive them? n(%)			
< 1 month	3 (3.9)	2 (2.6)	5 (3.3)
1 – 3 months	2 (2.6)	4 (5.2)	6 (3.9)
3 – 6 months	4 (5.2)	10 (13.0)	14 (9.1)
> 6 months	18 (23.4)	13 (16.9)	31 (20.1)
Don't know/Unsure	20 (26.0)	16 (20.8)	36 (23.4)
Missing	30 (39.0)	32 (41.6)	62 (40.3)
Were any changes made to your workplace to allow you to do your job in the 6 months before your operation? n(%)			
Yes	14 (18.2)	14 (18.2)	28 (18.2)
No	59 (76.6)	52 (67.5)	111 (72.1)
Missing	4 (5.2)	11 (14.3)	15 (9.7)

[a] tick as many as apply so percentages are given out of the total

Table 37: Work Design Questionnaire at baseline for the cohort study, details given for each answer and overall average score, given for each arm and overall information provided at baseline

	Hip (n=77)	Knee (n=77)	Total (n=154)
Work scheduling autonomy			
The job allows me to make my own decisions about how to schedule my work. n(%)			
Strongly disagree	4 (5.2)	7 (9.1)	11 (7.1)
Disagree	7 (9.1)	9 (11.7)	16 (10.4)
Neither agree nor disagree	7 (9.1)	10 (13.0)	17 (11.0)
Agree	37 (48.1)	24 (31.2)	61 (39.6)
Strongly Agree	19 (24.7)	26 (33.8)	45 (29.2)
Missing	3 (3.9)	1 (1.3)	4 (2.6)
The job allows me to decide on the order in which things are done on the job. n(%)			
Strongly disagree	4 (5.2)	7 (9.1)	11 (7.1)
Disagree	7 (9.1)	9 (11.7)	16 (10.4)
Neither agree nor disagree	5 (6.5)	6 (7.8)	11 (7.1)
Agree	43 (55.8)	28 (36.4)	71 (46.1)
Strongly Agree	16 (20.8)	24 (31.2)	40 (26.0)
Missing	2 (2.6)	3 (3.9)	5 (3.3)
The job allows me to plan how I do my work. n(%)			
Strongly disagree	4 (5.2)	5 (6.5)	9 (5.8)
Disagree	6 (7.8)	7 (9.1)	13 (8.4)
Neither agree nor disagree	7 (9.1)	6 (7.8)	13 (8.4)
Agree	39 (50.7)	32 (41.6)	71 (46.1)
Strongly Agree	18 (23.4)	23 (29.9)	41 (26.6)
Missing	3 (3.9)	4 (5.2)	7 (4.6)
Work scheduling autonomy average	N=73	N=73	N=146
Mean (SD)	3.8 (0.9)	3.8 (1.2)	3.8 (1.1)
Median (Q1, Q3)	4 (3.3, 4.3)	4 (3, 5)	4 (3.3, 4.7)
(min, max)	(1,5)	(1,5)	(1,5)

Work Context - Ergonomics			
The seating arrangements on the job are adequate. n(%)			
Strongly disagree	10 (13.0)	6 (7.8)	16 (10.4)
Disagree	6 (7.8)	8 (10.4)	14 (9.1)
Neither agree nor disagree	13 (16.9)	7 (9.1)	20 (13.0)
Agree	30 (39.0)	26 (33.8)	56 (36.4)
Strongly Agree	14 (18.2)	23 (29.9)	37 (24.0)
Missing	4 (5.2)	7 (9.1)	11 (7.1)
The work place allows for all size differences between people in terms of clearance, reach, eye height, leg room etc. n(%)			
Strongly disagree	5 (6.5)	2 (2.6)	7 (4.6)
Disagree	7 (9.1)	7 (9.1)	14 (9.1)
Neither agree nor disagree	12 (15.6)	11 (14.3)	23 (14.9)
Agree	34 (44.2)	28 (36.4)	62 (40.3)
Strongly Agree	13 (16.9)	19 (24.7)	32 (20.8)
Missing	6 (7.8)	10 (13.0)	16 (10.4)
The job involves excessive reaching. n(%)			
Strongly disagree	11 (14.3)	9 (11.7)	20 (13.0)
Disagree	23 (29.9)	22 (28.6)	45 (29.2)
Neither agree nor disagree	10 (13.0)	18 (23.4)	28 (18.2)
Agree	16 (20.8)	15 (19.5)	31 (20.1)
Strongly Agree	11 (14.3)	4 (5.2)	15 (9.7)
Missing	6 (7.8)	9 (11.7)	15 (9.7)
Ergonomics Average	N=69	N=65	N=134
Mean (SD)	3.3 (0.8)	3.5 (0.7)	3.4 (0.7)
Median (Q1, Q3)	3.3 (3, 3..7)	3.3 (3, 4)	3.3 (3, 3.7)
(min, max)	(1,5)	(1,5)	(1,5)

Work Context - physical demands			
The job requires a great deal of muscular endurance. n(%)			
Strongly disagree	15 (19.5)	9 (11.7)	24 (15.6)
Disagree	17 (22.1)	17 (22.1)	34 (22.1)
Neither agree nor disagree	9 (11.7)	10 (13.0)	19 (12.3)
Agree	16 (20.8)	25 (32.5)	41 (26.6)
Strongly Agree	13 (16.9)	14 (18.2)	27 (17.5)
Missing	7 (9.1)	2 (2.6)	9 (5.8)
The job requires a great deal of muscular strength. n(%)			
Strongly disagree	16 (20.8)	11 (14.3)	27 (17.5)
Disagree	18 (23.4)	17 (22.1)	35 (22.7)
Neither agree nor disagree	11 (14.3)	13 (16.9)	24 (15.6)
Agree	15 (19.5)	18 (23.4)	33 (21.4)
Strongly Agree	11 (14.3)	13 (16.9)	24 (15.6)
Missing	6 (7.8)	5 (6.5)	11 (7.1)
The job requires a lot of physical effort. n(%)			
Strongly disagree	15 (19.5)	7 (9.1)	22 (14.3)
Disagree	17 (22.1)	16 (20.8)	33 (21.4)
Neither agree nor disagree	7 (9.1)	7 (9.1)	14 (9.1)
Agree	19 (24.7)	31 (40.3)	50 (32.5)
Strongly Agree	16 (20.8)	13 (16.9)	29 (18.8)
Missing	3 (3.9)	3 (3.9)	6 (3.9)
Physical demands average	N=70	N=72	N=142
Mean (SD)	2.9 (1.4)	3.2 (1.3)	3.1 (1.3)
Median (Q1, Q3)	2.7 (2, 4)	3.3 (2, 4)	3 (2, 4)
(min, max)	(1,5)	(1,5)	(1,5)

Social Characteristic			
I have the opportunity to develop close friendships in my job. n(%)			
Strongly disagree	5 (6.5)	3 (3.9)	8 (5.2)
Disagree	3 (3.9)	5 (6.5)	8 (5.2)
Neither agree nor disagree	8 (10.4)	12 (15.6)	20 (13.0)
Agree	36 (46.8)	29 (37.7)	65 (42.2)
Strongly Agree	22 (28.6)	24 (31.2)	46 (29.9)
Missing	3 (3.9)	4 (5.2)	7 (4.6)
I have the chance in my job to get to know other people. n(%)			
Strongly disagree	4 (5.2)	2 (2.6)	6 (3.9)
Disagree	0 (0.0)	2 (2.6)	2 (1.3)
Neither agree nor disagree	4 (5.2)	4 (5.2)	8 (5.2)
Agree	40 (52.0)	41 (53.3)	81 (52.6)
Strongly Agree	27 (35.1)	27 (35.1)	54 (35.1)
Missing	2 (2.6)	1 (1.3)	3 (2.0)
I have the opportunity to meet with others in my work. n(%)			
Strongly disagree	3 (3.9)	1 (1.3)	4 (2.6)
Disagree	3 (3.9)	2 (2.6)	5 (3.3)
Neither agree nor disagree	3 (3.9)	2 (2.6)	5 (3.3)
Agree	39 (50.7)	40 (52.0)	79 (51.3)
Strongly Agree	26 (33.8)	29 (37.7)	55 (35.7)
Missing	3 (3.9)	3 (3.9)	6 (3.9)
My supervisor is concerned about the welfare of the people that work for him/her. n(%)			
Strongly disagree	5 (6.5)	3 (3.9)	8 (5.2)
Disagree	7 (9.1)	3 (3.9)	10 (6.5)
Neither agree nor disagree	6 (7.8)	17 (22.1)	23 (14.9)
Agree	29 (37.7)	25 (32.5)	54 (35.1)
Strongly Agree	15 (19.5)	23 (29.9)	38 (24.7)
Missing	15 (19.5)	6 (7.8)	21 (13.6)

People I work with take a personal interest in me. n(%)			
Strongly disagree	3 (3.9)	2 (2.6)	5 (3.3)
Disagree	4 (5.2)	2 (2.6)	6 (3.9)
Neither agree nor disagree	9 (11.7)	10 (13.0)	19 (12.3)
Agree	37 (48.1)	32 (41.6)	69 (44.8)
Strongly Agree	20 (26.0)	26 (33.8)	46 (29.9)
Missing	4 (5.2)	5 (6.5)	9 (5.8)
People I work with are friendly. n(%)			
Strongly disagree	2 (2.6)	1 (1.3)	3 (2.0)
Disagree	0 (0.0)	0 (0.0)	0 (0.0)
Neither agree nor disagree	5 (6.5)	3 (3.9)	8 (5.2)
Agree	39 (50.7)	41 (53.3)	80 (82.0)
Strongly Agree	27 (35.1)	28 (36.4)	55 (35.7)
Missing	4 (5.2)	4 (5.2)	8 (5.2)
Social Characteristics average	N=62	N=70	N=132
Mean (SD)	4.0 (0.8)	4.1 (0.8)	4.1 (0.8)
Median (Q1, Q3)	4 (3.8, 4.5)	4 (3.7, 4.8)	4 (3.8, 4.7)
(min, max)	(1,5)	(1.5, 5)	(1,5)

Table 38: Advice given and expectations before the operation, for each operation type and overall for the cohort participants

	Hip (n=77)	Knee (n=77)	Total (n=154)
Do you have access to an occupational health service through your employer? n(%)			
Yes	25 (32.5)	19 (24.7)	44 (28.6)
No	41 (53.3)	39 (50.7)	80 (52.0)
Unsure/Don't know	6 (7.8)	13 (16.9)	19 (12.3)
Missing	5 (6.5)	6 (7.8)	11 (7.1)
Have you received any advice from any individual or organisation about returning to work following your operation? n(%)			
Yes	17 (22.1)	22 (28.6)	39 (25.3)
No	54 (70.1)	49 (63.6)	103 (66.9)
Unsure/Don't know	0 (0.0)	1 (1.3)	1 (0.7)
Missing	6 (7.8)	5 (6.5)	11 (7.1)
If you received advice about returning to work, whom did you receive it from? [a] n(%)			
Surgeon	10 (13.0)	10 (13.0)	20 (13.0)
GP	2 (2.6)	8 (10.4)	10 (13.0)
Occupational Health	4 (5.2)	7 (9.1)	11 (7.1)
Physiotherapist	3 (3.9)	9 (11.7)	12 (7.8)
Occupational therapist	0 (0.0)	5 (3.3)	5 (3.3)
Employer	3 (3.9)	5 (3.3)	8 (10.4)
Other	3 (3.9)	2 (2.6)	5 (3.3)
Have you received any advice about when it is safe to start driving after your operation? n(%)			
Yes	51 (66.2)	51 (66.2)	102 (66.2)
No	15 (19.5)	18 (23.4)	33 (21.4)
Unsure/Don't know	4 (5.2)	4 (5.2)	8 (5.2)
Missing	7 (9.1)	4 (5.2)	11 (7.1)
How long do you think it will be before you are ready to return to work after your operation? (weeks)	N=73	N=67	N=140
Mean (SD)	9.9 (8.2)	8.9 (4.7)	9.5 (6.8)
Median (Q1, Q3)	8 (6, 12)	8 (6, 12)	8 (6, 12)
(min, max)	(1, 68)	(1, 24)	(1, 68)
How long do you think it will be before your employer is happy for you to return to work after your operation? (weeks)	N=59	N=52	N=111
Mean (SD)	9.7 (9.9)	9.4 (4.4)	9.6 (7.8)
Median (Q1, Q3)	8 (6, 12)	9 (7, 12)	8 (6, 12)

(min, max)	(0, 78)	(0, 24)	(0, 78)
How long do you think it will be before you are ready to return to your usual daily activities after your operation? (weeks) Mean (SD) Median (Q1, Q3) (min, max)	N=72 9.2 (10.5) 6 (6, 12) (1, 78)	N=68 9.3 (5.1) 8 (6, 12) (1, 26)	N=140 9.3 (8.3) 8 (6, 12) (1, 78)
How long do you think it will be before you are ready to drive after your operation? (weeks) Mean (SD) Median (Q1, Q3) (min, max)	N=65 6.5 (2.1) 6 (6, 6) (2, 16)	N=67 6.1 (3.1) 6 (5, 6) (1, 20)	N=132 6.3 (2.7) 6 (6, 6) (1, 20)

[a] tick as many as apply so percentages are given out of the total

Table 39: Oxford Hip & Knee Score in categorised form and descriptively for the cohort study at each time point, both by type of operation, and overall.

	Hip	**Knee**	**Total**
Baseline	N=77	N=77	N=154
Satisfactory (40 - 48)	1 (1.3)	1 (1.3)	2 (1.3)
Mild to Moderate (30 - 39)	4 (5.2)	8 (10.4)	12 (7.8)
Moderate to Severe (20 - 29)	28 (36.4)	30 (39.0)	58 (37.7)
Severe (0 - 19)	41 (53.3)	35 (45.5)	76 (49.4)
Missing	3 (3.9)	3 (3.9)	6 (3.9)
	N=74	N=74	N=148
Mean (SD)	19.2 (7.3)	20.9 (7.5)	20.1 (7.4)
Median (Q1, Q3)	18.5 (15, 23)	20 (15, 27)	19 (15, 25)
(min, max)	(6, 44)	(8, 44)	(6, 44)
Week 8	N=50	N=43	N=93
Satisfactory (40 - 48)	15 (30.0)	3 (7.0)	18 (19.4)
Mild to Moderate (30 - 39)	19 (38.0)	17 (39.5)	36 (38.7)
Moderate to Severe (20 -29)	11 (22.0)	17 (39.5)	28 (30.1)
Severe (0 - 19)	5 (10.0)	6 (14.0)	11 (11.8)
Missing	0 (0.0)	0 (0.0)	0 (0.0)
	N= 50	N=43	N=93
Mean (SD)	33.6 (9.2)	28.3 (8.4)	31.1 (91)
Median (Q1, Q3)	36.5 (26, 40)	28 (22, 34)	32 (24, 39)
(min, max)	(16, 48)	(10, 45)	(10, 48)
Week 16	N=53	N=51	N=104
Satisfactory (40 - 48)	31 (58.5)	16 (31.4)	47 (45.2)
Mild to Moderate (30 - 39)	10 (18.9)	18 (35.3)	28 (26.9)
Moderate to Severe (20 -29)	6 (11.3)	9 (17.6)	15 (14.4)
Severe (0 - 19)	2 (3.8)	4 (738)	6 (5.8)
Missing	4 (7.5)	4 (7.8)	8 (7.7)
	N=49	N=47	N=96
Mean (SD)	38.6 (9.2)	34.1 (8.8)	36.4 (9.2)
Median (Q1, Q3)	42 (34, 45)	35 (29, 41.5)	39 (30, 44)

(min, max)	(12, 48)	(14, 46)	(12, 48)
Week 24[a]	N=23	N=18	N=41
Satisfactory (40 - 48)	11 (47.8)	7 (38.9)	18 (43.9)
Mild to Moderate (30 - 39)	3 (13.0)	8 (44.4)	11 (26.8)
Moderate to Severe (20 -29)	5 (21.7)	2 (11.1)	7 (17.1)
Severe (0 - 19)	2 (8.7)	1 (5.6)	3 (7.3)
Missing	(8.7)	0 (0.0)	2 (4.9)
	N=21	N=18	N=39
Mean (SD)	36.0 (13.2)	35.7 (10.6)	35.8 (11.9)
Median (Q1, Q3)	43 (25, 47)	37 (31, 43)	38 (29, 46)
(min, max)	(8, 48)	(2, 47)	(2, 48)

[a] Percentages given out of those were sent the week 24 follow-up questionnaire (n=87)

Table 40: Details on the Cohort returnee's first weeks back at work; data combined across the time-points

	Hip (n=37)	Knee (n=41)	Total (n=78)
Did you return to work doing your usual hours and duties?			
Yes	18 (48.7)	20 (47.6)	38 (48.1)
No	17 (46.0)	20 (47.6)	37 (47.4)
I have started a new job	2 (5.4)	1 (2.4)	3 (3.8)
Missing	0 (0.0)	0 (0.0)	0 (0.0)
If you did not return to work doing your usual hours and duties: how you were working on your first week at work following your operation?	N=17	N=20	N=37
Reduced hours, usual duties	6 (35.3)	8 (40.0)	14 (37.8)
Usual hours but with amended or altered duties	1 (5.8)	2 (10.0)	3 (8.1)
Reduced hours and amended or altered duties	9 (52.9)	10 (50.0)	19 (51.4)
Missing	1 (5.8)	0 (0.0)	1 (2.7)
If you returned to work on reduced hours:			
Hours worked during first week back at work?	N=15	N=18	N=33
Mean (SD)	14.4 (10.2)	17.9 (10.2)	16.3 (10.2)
Median (Q1, Q3)	13 (7, 20)	17.5 (9, 28)	14 (8, 20)
(min, max)	(3, 40)	(3, 37)	(3, 40)
If you returned to work on reduced hours:			
Usual number of hours worked	N=13	N=18	N=31
Mean (SD)	32.2 (15.2)	35.4 (13.6)	34 (14.1)
Median (Q1, Q3)	37 (20, 38)	36.5 (30, 40)	36.5 (30, 40)
(min, max)	(6, 60)	(8, 65)	(6, 65)
Were any adaptions or changes made to your workplace to help you return to work?			
Yes	5 (13.5)	8 (19.5)	13 (16.7)
No	27 (73.0)	30 (73.2)	57 (73.1)
Don't know/Unsure	1 (2.7)	0 (0.0)	1 (1.3)
Missing	4 (10.8)	3 (7.3)	7 (9.0)
Were any adaptions or changes made your pattern of work to help you return to work?			
Yes	10 (27.0)	12 (29.3)	22 (28.2)
No	22 (59.5)	24 (58.5)	46 (59.0)
Don't know/Unsure	0 (0.0)	0 (0.0)	0 (0.0)
Missing	5 (13.5)	5 (12.2)	10 (12.8)

Table 41: Use of fit notes and returning to activities for each operation type, and overall, at each follow-up time point

	Hip (n=77)	**Knee (n=77)**	**Total (n=154)**
Have you been provided with a 'fit note' following your recent operation?			
Week 8	N=50	N=43	N=93
Yes	30 (60.0)	17 (39.5)	47 (50.5)
No	16 (32.0)	16 (37.2)	32 (34.4)
Missing	4 (0.8)	10 (23.3)	14 (15.1)
Week 16	N=53	N=51	N=104
Yes	26 (49.1)	25 (49.0)	51 (49.0)
No	18 (34.0)	20 (39.2)	38 (36.5)
Missing	9 (17.0)	6 (11.8)	15 (14.4)
Week 24[a]	N=23	N=19	N=42
Yes	13 (56.5)	10 (52.6)	23 (54.8)
No	3 (13.0)	2 (10.5)	5 (11.9)
Missing	7 (30.4)	7 (36.8)	14 (33.3)
If Yes, how many fit notes have you received since your operation?			
Week 8	N=30	N=17	N=47
Mean (SD)	1.8 (0.7)	2.3 (0.8)	2.0 (0.8)
Median (Q1, Q3)	2 (1, 2)	2 (2, 3)	2 (1, 2)
(min, max)	(1, 3)	(1, 4)	(1, 4)
Week 16	N=25	N=23	N=48
Mean (SD)	2.3 (1.2)	2.7 (1.2)	2.5 (1.2)
Median (Q1, Q3)	2 (1, 3)	3 (2, 3)	2 (1.5, 3)
(min, max)	(1, 5)	(1, 6)	(1, 6)
Week 24[a]	N=13	N=10	N=23
Mean (SD)	3 (1.7)	2.8 (0.9)	2.9 (1.4)
Median (Q1, Q3)	2 (2, 5)	2.5 (2, 3)	2 (2, 4)
(min, max)	(1, 6)	(2, 4)	(1, 6)
How many of the fit notes you were given advised that you were :			
Week 8			
Not fit for work	N=29	N=17	N=46
Mean (SD)	1.7 (0.8)	2.2 (0.8)	(0.8)

Median (Q1, Q3) (min, max)	2 (1, 2) (0, 3)	2 (2, 3) (1, 4)	2 (1, 2) (0, 4)
Don't know, n (%) Missing, n (%)	0 (0.0) 1 (3.3)	0 (0.0) 0 (0.0)	0 (0.0) 1 (2.2)
May be fit for work Mean (SD) Median (Q1, Q3) (min, max)	N=24 0.1 (0.3) 0 (0, 0) (0, 1)	N=16 0.1 (0.3) 0 (0, 0) (0, 1)	N=40 0.1 (0.3) 0 (0, 0) (0, 1)
Don't know, n(%) Missing, n(%)	2 (6.7) 4 (13.3)	0 (0.0) 1 (6.3)	2 (4.4) 5 (10.9)
Week 16 ***Not fit for work*** Mean (SD) Median (Q1, Q3) (min, max)	N=29 1.9 (1.4) 2 (1, 3) (0, 5)	N=26 2.1 (1.6) 2 (0, 3) (0, 6)	N=55 2 (1.6) 2 (1, 3) (0, 6)
Don't know, n (%) Missing, n (%)	2 (3.8) 22 (41.5)	4 (7.8) 21 (41.2)	6 (5.8) 43 (41.4)
May be fit for work Mean (SD) Median (Q1, Q3) (min, max)	N=28 0.1 (0.4) 0 (0, 0) (0, 1)	N=26 0.1 (0.3) 0 (0, 0) (0, 1)	N=54 0.1 (0.3) 0 (0, 0) (0, 1)
Don't know, n(%) Missing, n(%)	3 (5.7) 22 (41.5)	3 (5.9) 22 (41.5)	6 (5.8) 44 (42.3)
Week 24[a] ***Not fit for work*** Mean (SD) Median (Q1, Q3) (min, max)	N=14 2.4 (1.7) 2 (1, 3) (0, 6)	N=10 2.4 (1.2) 2 (2, 3) (0, 4)	N=24 2.4 (1.5) 2 (2, 3) (0, 6)

Don't know, n(%)	0 (0.0)	0 (0.0)	0 (0.0)
Missing, n(%)	9 (39.1)	8 (44.4)	17 (41.5)
May be fit for work	N=14	N=10	N=24
Mean (SD)	0.4 (0.9)	0 (0.0)	0.3 (0.7)
Median (Q1, Q3)	0 (0, 1)	0 (0, 0)	0 (0, 0)
(min, max)	(0, 3)	(0, 0)	(0, 3)
Don't know, n(%)	0 (0.0)	0 (0.0)	0 (0.0)
Missing, n(%)	9 (39.1)	8 (44.4)	17 (41.5)
The doctor that provided the note was: n(%)			
Week 8	N=30	N=16	N=46
Hospital Doctor	9 (30.0)	2 (12.5)	11 (23.9)
GP	21 (70.0)	14 (87.5)	35 (76.1)
Don't know	0 (0.0)	0 (0.0)	0 (0.0)
Missing	0 (0.0)	0 (0.0)	0 (0.0)
Week 16	N=26	N=26	N=52
Hospital Doctor	8 (30.8)	0 (0.0)	8 (15.4)
GP	16 (61.5)	22 (84.6)	38 (73.1)
Don't know	1 (3.9)	2 (7.7)	3 (5.8)
Missing	1 (3.9)	2 (7.7)	3 (5.8)
Week 24	N=13	N=10	N=23
Hospital Doctor	4 (30.8)	0 (0.0)	4 (17.4)
GP	9 (69.2)	10 (0.0)	19 (82.6)
Don't know	0 (0.0)	0 (0.0)	0 (0.0)
Missing	0 (0.0)	0 (0.0)	0 (0.0)
The length of the note, weeks			
Week 8	N=28	N=17	N=44
Mean (SD)	5.7 (2.2)	5.4 (2.7)	5.6 (2.4)
Median (Q1, Q3)	6 (4, 7)	4 (4, 8)	6 (4, 8)
(min, max)	(2, 10)	(2, 10)	(2, 10)

Week 16	N=24	N=16	N=40
Mean (SD)	6.4 (2.8)	3.9 (1.5)	5.4 (2.7)
Median (Q1, Q3)	6 (4, 7)	4 (3, 4)	4 (4, 6)
(min, max)	(2, 12)	(2, 8)	(2, 12)
Week 24[a]	N=10	N=9	N=19
Mean (SD)	5.4 (3.0)	3.6 (1.3)	4.5 (2.5)
Median (Q1, Q3)	6 (4, 8)	4 (2, 4)	4 (2, 6)
(min, max)	(0, 10)	(2, 6)	(0, 10)
Which of the following options were selected: [c]			
Week 8	N=30	N=16	N=46
You are NOT fit for work	26 (86.7)	14 (87.5)	40 (87.0)
You MAY be fit for work taking in to account - a phased return to work	3 (10.0)	1 (6.3)	4 (8.7)
You MAY be fit for work taking in to account - amended duties	0 (0.0)	0 (0.0)	0 (0.0)
You MAY be fit for work taking in to account - altered hours	0 (0.0)	0 (0.0)	0 (0.0)
You MAY be fit for work taking in to account - workplace adaptions	0 0.0)	0 (0.0)	0 0.0)
Don't know/Unsure	1 (3.3)	0 (0.0)	1 (2.2)
Week 16	N=26	N=26	N=34
You are NOT fit for work	18 (69.2)	16 (61.5)	34 (65.4)
You MAY be fit for work taking in to account - a phased return to work	3 (11.5)	5 (19.2)	8 (15.4)
You MAY be fit for work taking in to account - amended duties	1 (3.9)	3 (11.5)	4 (7.7)
You MAY be fit for work taking in to account - altered hours	0 (0.0)	0 (0.0)	0 (0.0)
You MAY be fit for work taking in to account - workplace adaptions	1 (3.9)	0 (0.0)	0 (0.0)
Don't know/Unsure	1 (3.9)	1 (3.9)	2 (3.9)
Week 24[a]	N=13	N=10	N=23
You are NOT fit for work	9 (69.2)	9 (90.0)	18 (78.3)
You MAY be fit for work taking in to account - a phased return to work	2 (15.4)	1 (10.0)	3 (13.0)
You MAY be fit for work taking in to account - amended duties	1 (7.7)	0 (0.0)	1 (4.4)
You MAY be fit for work taking in to account - altered hours	0 (0.0)	0 (0.0)	0 (0.0)
You MAY be fit for work taking in to account - workplace adaptions	0 (0.0)	0 (0.0)	0 (0.0)
Don't know/Unsure	1 (7.7)	0 (0.0)	1 (4.4)
When did you first drive following your operation? (Weeks post-surgery)			
Week 8	N=35	N=28	N=63

Mean (SD)	5.8 (1.9)	5.6 (2.0)	5.7 (1.9)
Median (Q1, Q3)	6 (4, 7)	6 (4.5, 7)	6 (4, 7)
(min, max)	(2, 10)	(0, 8)	(0, 10)
Don't know, n (%)	1 (2.0)	1 (2.3)	2 (2.2)
I don't drive, n (%)	3 (6.0)	0 (0.0)	3 (3.2)
Missing	11 (22.0)	14 (32.6)	25 (26.9)
Week 16	N=33	N=30	N=63
Mean (SD)	6.5 (1.9)	6.5 (2.8)	6.5 (2.3)
Median (Q1, Q3)	6 (6, 7)	6 (4.5, 8)	6 (5, 8)
(min, max)	(3, 12)	(1, 12)	(1, 12)
Don't know, n(%)	2 (3.8)	0 (0.0)	2 (1.9)
I don't drive, n(%)	5 (9.4)	2 (3.9)	7 (6.7)
Missing	13 (24.5)	19 (37.3)	32 (30.8)
Week 24	N=12	N=11	N=23
Mean (SD)	6.3 (3.3)	5.9 (1.9)	6.1 (2.6)
Median (Q1, Q3)	6 (3.5, 9)	6 (4, 7)	6 (4, 8)
(min, max)	(1, 12)	(4, 10)	(1, 12)
Don't know, n (%)	1 (4.4)	0 (0.0)	1 (2.4)
I don't drive, n (%)	3 (13.0)	0 (0.0)	3 (7.3)
Missing	7 (30.4)	7 (38.9)	14 (34.2)

Table 42: Workplace Limitations Questionnaire[125] results for each question, and percentage of time lot, for each time point, by operation type and overall

In the last two weeks how much of the time:	**Hip (n=77)**	**Knee (n=77)**	**Total (n=154)**
Did your physical health or emotional problems make it difficult for you to get going easily at the beginning of the day? n(%)			
Baseline	N=77	N=77	N=154
Difficult all of the time	6 (7.8)	4 (5.2)	10 (6.5)
Difficult most of the time	15 (19.5)	21 (27.3)	36 (23.4)
Difficult some of the time	21 (27.3)	19 (24.7)	40 (26.0)
Difficult a slight bit of the time	11 (14.3)	13 (16.9)	24 (15.6)
Difficult none of the time	8 (10.4)	3 (3.9)	11 (7.1)
Does not apply to my job	1 (1.3)	1 (1.3)	2 (1.3)
Missing	15 (19.5)	16 (20.8)	31 (20.1)
Week 8	N=50	N=43	N=93
Difficult all of the time	0 (0.0)	0 (0.0)	0 (0.0)
Difficult most of the time	0 (0.0)	0 (0.0)	0 (0.0)
Difficult some of the time	1 (2.0)	2 (4.7)	3 (3.2)
Difficult a slight bit of the time	6 (12.0)	10 (23.3)	16 (17.2)
Difficult none of the time	5 (10.0)	6 (14.0)	11 (11.8)
Does not apply to my job	4 (8.0)	0 (0.0)	4 (4.3)
Missing	34 (68.0)	25 (58.1)	59 (63.4)
Week 16	N=53	N=51	N=104
Difficult all of the time	1 (1.9)	0 (0.0)	1 (1.0)
Difficult most of the time	1 (1.9)	3 (5.9)	4 (3.9)
Difficult some of the time	6 (11.3)	3 (5.9)	9 (8.7)
Difficult a slight bit of the time	7 (13.2)	13 (25.5)	20 (19.2)
Difficult none of the time	21 (39.6)	14 (27.5)	35 (33.7)
Does not apply to my job	2 (3.8)	3 (5.9)	5 (4.8)
Missing	15 (28.3)	15 (29.4)	30 (28.9)
Week 24	N=23	N=18	N=41
Difficult all of the time	0 (0.0)	0 (0.0)	0 (0.0)
Difficult most of the time	3 (13.0)	3 (16.7)	6 (14.6)
Difficult some of the time	0 (0.0)	2 (11.1)	2 (4.9)
Difficult a slight bit of the time	3 (13.0)	5 (27.8)	8 (19.5)

Difficult none of the time	9 (39.1)	5 (27.8)	14 (34.2)
Does not apply to my job	1 (4.4)	0 (0.0)	1 (2.4)
Missing	7 (30.4)	3 (16.7)	10 (24.4)
Did your physical health or emotional problems make it difficult for you to start your job on time as soon as you arrived at work? n(%)			
Baseline	N=77	N=77	N=154
Difficult all of the time	4 (5.19)	4 (5.19)	8 (5.19)
Difficult most of the time	9 (11.7)	8 (10.4)	17 (11.0)
Difficult some of the time	12 (15.6)	11 (14.3)	23 (14.9)
Difficult a slight bit of the time	12 (15.6)	17 (22.1)	29 (18.8)
Difficult none of the time	18 (23.4)	16 (20.8)	34 (22.1)
Does not apply to my job	6 (7.8)	5 (6.5)	11 (7.1)
Missing	16 (20.8)	16 (20.8)	32 (20.8)
Week 8	N=50	N=43	N=93
Difficult all of the time	0 (0.0)	0 (0.0)	0 (0.0)
Difficult most of the time	0 (0.0)	0 (0.0)	0 (0.0)
Difficult some of the time	0 (0.0)	1 (2.3)	1 (1.1)
Difficult a slight bit of the time	4 (8.0)	3 (7.0)	7 (7.5)
Difficult none of the time	5 (10.0)	8 (18.6)	13 (14.0)
Does not apply to my job	4 (8.0)	3 (7.0)	7 (7.5)
Missing	37 (74.0)	28 (65.1)	65 (6996)
Week 16	N=53	N=51	N=104
Difficult all of the time	0 (0.0)	0 (0.0)	0 (0.0)
Difficult most of the time	1 (1.9)	0 (0.0)	1 (1.0)
Difficult some of the time	4 (7.6)	6 (11.8)	10 (9.6)
Difficult a slight bit of the time	6 (11.3)	3 (5.9)	9 (8.7)
Difficult none of the time	25 (47.2)	20 (39.2)	45 (43.3)
Does not apply to my job	2 (3.8)	6 (11.8)	8 (7.7)
Missing	15 (28.3)	16(31.4)	31 (29.8)
Week 24	N=23	N=18	N=41
Difficult all of the time	0 (0.0)	0 (0.0)	0 (0.0)
Difficult most of the time	1 (4.4)	0 (0.0)	1 (2.4)
Difficult some of the time	1 (4.4)	1 (5.6)	2 (4.9)

Difficult a slight bit of the time	1 (4.4)	5 (27.8)	6 (14.6)
Difficult none of the time	10 (43.5)	7 (38.9)	18 (41.5)
Does not apply to my job	3 (13.0)	2 (11.1)	5 (12.2)
Missing	7 (30.4)	3 (16.7)	10 (24.4)
Were you able to sit, stand, or stay in one position for longer than 15 minutes while working, without difficulty caused by physical health or emotional problems? n(%)			
Baseline	N=77	N=77	N=154
Able all of the time	3 (3.9)	6 (7.8)	9 (5.8)
Able most of the time	16 (20.8)	19 (24.7)	35 (22.7)
Able some of the time	22 (28.6)	16 (20.8)	38 (24.7)
Able a slight bit of the time	14 (18.2)	12 (15.6)	26 (16.9)
Able none of the time	2 (2.6)	4 (5.2)	6 (3.9)
Does not apply to my job	4 (5.2)	3 (3.9)	7 (4.6)
Missing	16 (20.8)	17 (22.1)	33 (21.4)
Week 8	N=50	N=43	N=93
Able all of the time	3 (6.0)	6 (14.0)	9 (9.7)
Able most of the time	2 (4.0)	3 (7.0)	5 (5.4)
Able some of the time	2 (4.0)	2 (4.7)	4 (4.3)
Able a slight bit of the time	2 (4.0)	4 (9.3)	6 (6.5)
Able none of the time	0 (0.0)	1 (2.3)	1 (1.1)
Does not apply to my job	4 (8.0)	1 (2.3)	5 (5.4)
Missing	37 (74.0)	26 (59.5)	63 (67.7)
Week 16	N=53	N=51	N=104
Able all of the time	11 (20.8)	9 (17.7)	20 (19.2)
Able most of the time	9 (17.0)	11 (21.6)	20 (19.2)
Able some of the time	8 (15.1)	6 (11.8)	14 (13.5)
Able a slight bit of the time	4 (7.6)	4 (7.8)	8 (7.7)
Able none of the time	5 (9.4)	2 (3.9)	7 (6.7)
Does not apply to my job	2 (3.8)	3 (5.9)	5 (4.8)
Missing	4 (26.4)	16 (31.4)	30 (28.9)
Week 24	N=23	N=18	N=41
Able all of the time	2 (8.7)	4 (22.2)	6 (14.6)
Able most of the time	6 (26.1)	3 (16.7)	9 (22.0)

Able some of the time	3 (13.0)	4 (22.2)	7 (17.1)
Able a slight bit of the time	2 (8.7)	2 (11.1)	4 (9.8)
Able none of the time	1 (4.4)	0 (0.0)	1 (2.4)
Does not apply to my job	2 (8.7)	2 (11.1)	4 (9.8)
Missing	7 (30.4)	3 (16.7)	10 (24.4)
Were you able to repeat the same motions over and over again while working, without difficulty caused by physical health or emotional problems? n(%)			
Baseline	N=77	N=77	N=154
Able all of the time	1 (1.3)	5 (6.5)	6 (3.9)
Able most of the time	16 (20.8)	18 (23.4)	34 (22.1)
Able some of the time	25 (32.5)	16 (20.8)	41 (26.6)
Able a slight bit of the time	14 (18.2)	13 (16.9)	27 (17.5)
Able none of the time	2 (2.6)	3 (3.9)	5 (3.3)
Does not apply to my job	4 (5.2)	4 (5.2)	8 (5.2)
Missing	15 (19.5)	18 (23.4)	33 (21.4)
Week 8	N=50	N=43	N=93
Able all of the time	2 (4.0)	5 (11.6)	7 (7.5)
Able most of the time	5 (10.0)	5 (11.6)	10 (10.8)
Able some of the time	0 (0.0)	0 (0.0)	0 (0.0)
Able a slight bit of the time	1 (2.0)	4 (9.3)	5 (5.4)
Able none of the time	0 (0.0)	0 (0.0)	0 (0.0)
Does not apply to my job	5 (10.0)	3 (7.0)	8 (8.6)
Missing	37 (74.0)	26 (60.5)	63 (67.7)
Week 16	N=53	N=51	N=104
Able all of the time	12 (22.6)	9 (17.7)	21 (20.2)
Able most of the time	11 (20.8)	11 (21.6)	22 (21.2)
Able some of the time	5 (9.4)	5 (9.8)	10 (9.6)
Able a slight bit of the time	4 (7.6)	2 (3.9)	6 (5.8)
Able none of the time	0 (0.0)	2 (3.9)	2 (1.9)
Does not apply to my job	7 (13.2)	5 (9.8)	12 (11.5)
Missing	14 (26.4)	17 (33.3)	31 (29.8)
Week 24	N=23	N=18	N=41
Able all of the time	6 (26.1)	3 (16.7)	9 (22.0)

Able most of the time	3 (13.0)	7 (38.9)	10 (24.4)
Able some of the time	3 (13.0)	3 (16.7)	6 (14.6)
Able a slight bit of the time	1 (4.4)	1 (5.6)	2 (4.9)
Able none of the time	1 (4.4)	0 (0.0)	1 (2.4)
Does not apply to	2 (8.7)	1 (5.6)	3 (7.3)
Missing	7 (30.4)	3 (16.7)	10 (24.4)
Did your physical health or emotional problems make it difficult for you to concentrate on your work? n(%)			
Baseline	N=77	N=77	N=154
Difficult all of the time	1 (1.3)	0 (0.0)	1 (0.7)
Difficult most of the time	10 (13.0)	8 (10.4)	18 (11.7)
Difficult some of the time	16 (20.8)	18 (23.4)	34 (22.1)
Difficult a slight bit of the time	15 (19.5)	18 (23.4)	33 (21.4)
Difficult none of the time	14 (18.2)	13 (16.9)	27 (17.5)
Does not apply to my job	8 (10.4)	5 (6.5)	13 (8.4)
Missing	13 (16.9)	15 (19.5)	28 (18.2)
Week 8	N=50	N=43	N=93
Difficult all of the time	0 (0.0)	0 (0.0)	0 (0.0)
Difficult most of the time	1 (2.0)	0 (0.0)	1 (1.1)
Difficult some of the time	2 (4.0)	1 (2.3)	3 (3.2)
Difficult a slight bit of the time	3 (6.0)	4 (9.3)	7 (7.5)
Difficult none of the time	8 (16.0)	12 (27.9)	20 (21.5)
Does not apply to my job	2 (4.0)	0 (0.0)	2 (2.2)
Missing	34 (68.0)	26 (60.5)	60 (64.5)
Week 16	N=53	N=51	N=104
Difficult all of the time	0 (0.0)	0 (0.0)	0 (0.0)
Difficult most of the time	0 (0.0)	1 (2.0)	1 (1.0)
Difficult some of the time	4 (7.6)	1 (2.0)	5 (4.8)
Difficult a slight bit of the time	8 (15.1)	8 (15.78)	16 (15.4)
Difficult none of the time	24 (45.3)	19 (37.3)	43 (41.4)
Does not apply to my job	3 (5.7)	6 (11.8)	9 (8.7)
Missing	14 (26.4)	16 (31.4)	30 (28.9)
Week 24	N=23	N=18	N=41

Difficult all of the time	0 (0.0)	0 (0.0)	0 (0.0)
Difficult most of the time	0 (0.0)	1 (5.6)	1 (2.4)
Difficult some of the time	3 (13.0)	2 (11.1)	5 (12.2)
Difficult a slight bit of the time	3 (13.0)	4 (22.2)	7 (17.1)
Difficult none of the time	9 (39.1)	6 (33.3)	15 (36.6)
Does not apply to my job	1 (4.4)	2 (11.1)	3 (7.3)
Missing	7 (30.4)	3 (16.7)	10 (24.4)
Did your physical health or emotional problems make it difficult for you to speak with people in-person, in meetings or on the phone? n(%)			
Baseline	N=77	N=77	N=154
Difficult all of the time	1 (1.3)	0 (0.0)	1 (0.7)
Difficult most of the time	4 (5.2)	4 (5.2)	8 (5.2)
Difficult some of the time	9 (11.7)	7 (9.1)	16 (10.4)
Difficult a slight bit of the time	15 (19.5)	14 (18.2)	29 (18.8)
Difficult none of the time	27 (35.1)	26 (33.8)	53 (34.4)
Does not apply to my job	9 (11.7)	10 (13.0)	19 (12.3)
Missing	12 (15.6)	16 (20.8)	28 (18.2)
Week 8	N=50	N=43	N=93
Difficult all of the time	0 (0.0)	0 (0.0)	0 (0.0)
Difficult most of the time	0 (0.0)	0 (0.0)	0 (0.0)
Difficult some of the time	0 (0.0)	0 (0.0)	0 (0.0)
Difficult a slight bit of the time	4 (8.0)	0 (0.0)	4 (4.3)
Difficult none of the time	9 (18.0)	15 (34.9)	24 (25.8)
Does not apply to my job	4 (8.0)	2 (4.7)	6 (6.5)
Missing	33 (66.0)	26 (60.5)	59 (63.4)
Week 16	N=53	N=51	N=104
Difficult all of the time	0 (0.0)	0 (0.0)	0 (0.0)
Difficult most of the time	0 (0.0)	0 (0.0)	0 (0.0)
Difficult some of the time	2 (3.8)	0 (0.0)	2 (1.9)
Difficult a slight bit of the time	7 (13.2)	3 (5.9)	10 (9.6)
Difficult none of the time	27 (50.9)	26 (51.0)	553(51.0)
Does not apply to my job	3 (5.7)	5 (9.8)	8 (7.7)
Missing	14 (26.4)	17 (33.3)	31 (29.8)

Week 24	N=23	N=18	N=41
Difficult all of the time	0 (0.0)	0 (0.0)	0 (0.0)
Difficult most of the time	0 (0.0)	0 (0.0)	0 (0.0)
Difficult some of the time	1 (4.4)	0 (0.0)	1 (2.4)
Difficult a slight bit of the time	2 (8.7)	2 (11.1)	4 (9.8)
Difficult none of the time	11 (47.8)	10 (55.6)	21 (51.2)
Does not apply to my job	2 (8.7)	3 (16.7)	5 (12.2)
Missing	7 (30.4)	3 (16.7)	10 (24.4)
Did your physical health or emotional problems make it difficult for you handle your workload? n(%)			
Baseline	N=77	N=77	N=154
Difficult all of the time	2 (2.6)	2 (2.6)	4 (2.6)
Difficult most of the time	9 (11.7)	14 (18.2)	23 (14.9)
Difficult some of the time	21 (27.3)	13 (16.9)	34 (22.1)
Difficult a slight bit of the time	19 (24.7)	12 (15.6)	31 (20.1)
Difficult none of the time	9 (11.7)	15 (19.5)	24 (15.6)
Does not apply to my job	5 (6.5)	5 (6.5)	10 (6.5)
Missing	12 (15.6)	16 (20.8)	28 (18.2)
Week 8	N=50	N=43	N=93
Difficult all of the time	1 (2.0)	0 (0.0)	1 (1.1)
Difficult most of the time	1 (2.0)	1 (2.3)	2 (2.2)
Difficult some of the time	0 (0.0)	1 (2.3)	1 (1.1)
Difficult a slight bit of the time	6 (12.0)	6 (14.0)	12 (13.0)
Difficult none of the time	5 (10.0)	8 (18.6)	13 (14.0)
Does not apply to my job	2 (4.0)	1 (2.3)	3 (3.2)
Missing	35 (70.0)	26 (60.5)	61 (65.6)
Week 16	N=53	N=51	N=104
Difficult all of the time	0 (0.0)	0 (0.0)	0 (0.0)
Difficult most of the time	0 (0.0)	0 (0.0)	0 (0.0)
Difficult some of the time	3 (5.7)	3 (5.9)	6 (5.8)
Difficult a slight bit of the time	7 (13.2)	7 (13.7)	14 (13.5)
Difficult none of the time	24 (45.3)	18 (35.3)	42 (40.4)
Does not apply to my job	5 (9.4)	7 (13.7)	12 (11.5)
Missing	14 (26.4)	16 (31.4)	30 (28.9)

Week 24	N=23	N=18	N=41
Difficult all of the time	0 (0.0)	0 (0.0)	0 (0.0)
Difficult most of the time	0 (0.0)	0 (0.0)	0 (0.0)
Difficult some of the time	1 (4.4)	1 (5.6)	2 (4.9)
Difficult a slight bit of the time	4 (17.4)	4 (22.2)	8 (19.5)
Difficult none of the time	9 (39.1)	8 (44.4)	17 (41.5)
Does not apply to my job	2 (8.7)	1 (5.6)	3 (7.3)
Missing	7 (30.4)	4 (22.2)	11 (26.8)
Did your physical health or emotional problems make it difficult for you to finish work on time? n(%)			
Baseline	N=77	N=77	N=154
Difficult all of the time	5 (6.5)	2 (2.6)	7 (4.6)
Difficult most of the time	9 (11.7)	10 (13.0)	19 (12.3)
Difficult some of the time	10 (13.0)	6 (7.8)	16 (10.4)
Difficult a slight bit of the time	9 (11.7)	10 (13.0)	19 (12.3)
Difficult none of the time	17 (22.1)	24 (31.2)	41 (26.6)
Does not apply to my job	13 (16.9)	9 (11.7)	22 (14.3)
Missing	14 (18.2)	16 (20.8)	30 (19.5)
Week 8	N=50	N=43	N=93
Difficult all of the time	1 (2.0)	1 (2.3)	2 (2.2)
Difficult most of the time	2 (4.0)	0 (0.0)	2 (2.2)
Difficult some of the time	0 (0.0)	0 (0.0)	0 (0.0)
Difficult a slight bit of the time	3 (6.0)	2 (4.7)	5 (5.4)
Difficult none of the time	7 (14.0)	9 (20.9)	16 (17.2)
Does not apply to my job	2 (4.0)	4 (9.3)	6 (6.5)
Missing	35 (70.0)	27 (62.8)	62 (66.7)
Week 16	N=53	N=51	N=104
Difficult all of the time	0 (0.0)	0 (0.0)	0 (0.0)
Difficult most of the time	0 (0.0)	0 (0.0)	0 (0.0)
Difficult some of the time	2 (3.8)	1 (2.0)	3 (2.9)
Difficult a slight bit of the time	4 (7.6)	5 (9.8)	9 (8.7)
Difficult none of the time	24 (45.3)	16 (31.4)	40 (38.5)
Does not apply to my job	9 (17.0)	13 (25.5)	22 (21.2)

Missing	14 (26.4)	176(31.4)	30 (28.9)
Week 24	N=23	N=18	N=41
Difficult all of the time	0 (0.0)	1 (5.6)	1 (2.4)
Difficult most of the time	1 (4.4)	0 (0.0)	1 (2.4)
Difficult some of the time	1 (4.4)	0 (0.0)	1 (2.4)
Difficult a slight bit of the time	2 (8.7)	2 (11.1)	4 (9.8)
Difficult none of the time	10 (43.5)	7 (38.9)	17 (41.5)
Does not apply to my job	2 (8.7)	4 (22.2)	6 (14.6)
Missing	7 (30.4	4 (22.2)	11 (26.8)
Percentage of time lost:			
Baseline	N=65	N=62	N=127
Mean (SD)	30.4 (34.1)	24.2 (31.7)	27.4 (32.9)
Median (Q1, Q3)	25 (0, 50)	0 (0, 50)	0 (0, 50)
(min, max)	(0, 100)	(0, 100)	(0, 100)
Week 8	N=19	N=18	N=37
Mean (SD)	19.7 (30.7)	11.1 (26.0)	15.5 (28.5)
Median (Q1, Q3)	0 (0, 25)	0 (0, 0)	0 (0, 25)
(min, max)	(0, 100)	(0, 100)	(0, 100)
Week 16	N=39	N=36	N=75
Mean (SD)	5.1 (13.1)	5.6 (12.1)	5.3 (12.1)
Median (Q1, Q3)	0 (0, 0)	0 (0, 0)	0 (0, 0)
(min, max)	(0,50)	(0, 50)	(0, 50)
Week 24	N=16	N=15	N=31
Mean (SD)	10.9 (22.3)	11.7 (26.5)	11.3 (24.0)
Median (Q1, Q3)	0 (0, 12.5)	0 (0, 25)	0 (0, 25)
(min, max)	(0, 75)	(0, 100)	(0, 100)

Table 43: Significance of factors tested for prediction of return to work for the cohort participants.

Factors included:	Coefficient	Standard Error	P-value	Factor significant?
Patient Characteristics				
Age	0.01	0.02	0.65	No
Gender:				
Male	-0.65	0.50	0.45	No
Female	0.48	0.33	0.15	No
BMI	-0.02	0.03	0.53	No
Ethnicity:				
White	-0.20	0.75	0.93	No
Non-white	0.21	0.69	0.76	No
Type of employer:				
Large (>250)	-0.21	0.25	0.39	No
Median (50-250)	0.21	0.56	0.71	No
Small (10-49)	0.50	0.59	0.40	No
Micro (2-9)	1.15	0.51	0.02	Yes
Self (1)	0.03	0.49	0.96	No
Type of Employment:				
Full time	-0.03	0.26	0.90	No
Part time	0.14	0.42	0.74	No
Self-employed	-0.02	0.42	0.96	No
Unpaid	0.73	0.61	0.23	No
Other	-0.66	1.3	0.60	No
Length of time with employer (years)	-0.01	0.02	0.53	No
Replacement of:				
Hip	-0.08	0.23	0.52	No
Knee	0.21	0.32	0.73	No
Standardised Measures at Baseline				
Oxford Hip/Knee Scale	-0.01	0.02	0.63	No
Brief Resilience Scale	-0.62	0.41	0.13	No
Work Design Questionnaire:				
Work Scheduling	0.06	0.16	0.71	No
Autonomy				
Ergonomics	0.10	0.24	0.68	No
Physical Demands	-0.25	0.13	0.06	No
Social Support	0.21	0.23	0.37	No
PHQ-9	0.03	0.03	0.41	No
Workplace Limitations Questionnaire	0.01	0.01	0.22	No

Since only a micro-employer (n=25 participants, 17.4% of the cohort) was considered a significant factor in predicting return to work time, it was determined it would not be possible to create a model to predict return to work.

Section 3: Supplementary information for health economic analyses

Table 44: Unit costs of resource use

Item	Unit of measurement	Unit cost	Additional notes	Source
GP visit at GP practice	Per patient contact	£37.40	Patient contact (surgery) lasting 9.22 minutes	[130]
GP visit at home	Per home visit (11.4 mins) plus 12 mins travel time	£93.60	Cost per GP clinic visit minute sourced from PSSRU 2018. Durations sourced from PSSRU 2015	[130, 342]
Nurse visit at GP practice	Per 15.5 min appointment	£10.85	Based on £42 per hour	[130]
Community nurse visit at home	Per consultation	£38.45	Community Health Services sheet: Consultation with District Nurse, face-to-face (adult)	[129]
Occupational therapist visit	Per hour	£47.00	Community occupational therapist (local authority), including training	[130]
Physiotherapist visit	Per visit	£57.25	Community Health Services sheet: Physiotherapist, one-to-one (adult)	[129]
Other health service visit	Per visit	£74.11	Community Health Services sheet: Other Therapist, one-to-one (adult)	[129]
Inpatient night in hospital (related to joint)	Per night	£405.34	Total HRG's sheet: Sum of total expenditure on excess bed days (elective and non-elective) divided by total activity for all HRG codes relating to knee/hip replacement*	[129]
Inpatient night in hospital (related to another reason)	Per night	£345.76	Total HRG's sheet: Sum of total expenditure on excess bed days (elective and non-elective) divided by total activity	[129]
Day case visit to hospital (related to joint)	Per day case admission	£1366.92	Day Case sheet: Sum of total cost divided by total activity for all HRG codes relating to knee/hip replacement*	[129]
Day case visit to hospital (related to another reason)	Per day case admission	£742.09	Total HRG's sheet: Sum of total cost divided by total activity for all day cases	[129]
Hospital outpatient visit (related to joint)	Per clinic visit	£145.52	Total Outpatient Attendances sheet: Rheumatology (code 410)	[129]
Hospital outpatient visit (related to another reason)	Per clinic visit	£125.01	Total Outpatient Attendances sheet: total cost for all outpatient attendances divided by total activity.	[129]
A&E visit	Per attendance	£160.32	Accident & Emergency sheet: Sum of total cost divided by total attendances for all A&E service codes	[129]
Hospital physiotherapy visit	Per attendance	£54.91	Total Outpatient Attendances sheet, service code 650 (physiotherapy)	[129]
Occupational health RTW advice	Assume 15 minutes	£4.30	Based on average wage of a health and safety officer being £35,078.	[4]
Employer RTW advice	Assume 15 minutes	£3.89	Based on the average of annual pay for managers/supervisors across a range of employment sectors being £31,716**	[4]

*excluding codes for those aged 18 or less, and CC scores of 4 or above; ** Average of: office managers, construction and building trades supervisors, customer service managers and supervisors, cleaning and

housekeeping managers and supervisors, financial accounts managers, leisure and sports managers, restaurant and catering establishment managers and proprietors, health care practice managers and sales accounts and business development managers.

Costing references

1. Department of Health. *NHS Reference Costs 2017/18*. 2018.[129]
2. Curtis, L. and A. Burns, *Unit Costs of Health and Social Care 2018*. 2018, Personal Social Services Research Unit: University of Kent.[130]
3. Curtis, L. and A. Burns, *Unit Costs of Health and Social Care 2015*. 2015, Personal Social Services Research Unit: University of Kent.[342]
4. Office for National Statistics (2018). "Employee earnings in the UK: 2018.". Retrieved 15/03/2019, from https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/bulletins/annualsurveyofhoursandearnings/2018.[135]

Table 45: Mean resource use, based on all available cases (in relation to 'another reason')

	Hip (n=77)			Knee (n=77)		
Type of resource use	Mean (SD)	Missing (%)		Mean (SD)	Missing (%)	
GP visits at GP practice						
Baseline*	0.61 (1.12)	21	27.3%	0.45 (0.92)	22	28.6%
8 weeks	0.29 (0.52)	39	50.6%	0.53 (0.75)	43	55.8%
16 weeks	0.56 (0.64)	38	49.4%	0.54 (1.17)	42	54.5%
24 weeks**	0.56 (0.86)	21	51.2%	0.31 (0.48)	30	65.2%
GP visits at home						
Baseline	0.00 (0.00)	21	27.3%	0.00 (0.00)	25	32.5%
8 weeks	0.00 (0.00)	40	51.9%	0.00 (0.00)	43	55.8%
16 weeks	0.06 (0.33)	41	53.2%	0.18 (1.04)	44	57.1%
24 weeks	0.00 (0.00)	24	58.5%	0.00 (0.00)	31	67.4%
Nurse visits at GP practice						
Baseline	0.45 (0.99)	21	27.3%	0.47 (1.07)	24	31.2%
8 weeks	0.24 (0.63)	39	50.6%	0.33 (0.72)	41	53.2%
16 weeks	0.41 (0.76)	40	51.9%	0.27 (0.57)	44	57.1%
24 weeks	0.41 (0.62)	24	58.5%	0.40 (0.83)	31	67.4%
Community nurse visits at home						
Baseline	0.00 (0.00)	22	28.6%	0.11 (0.82)	25	32.5%
8 weeks	0.00 (0.00)	40	51.9%	0.00 (0.00)	44	57.1%
16 weeks	0.76 (4.6)	40	51.9%	0.00 (0.00)	44	57.1%
24 weeks	0.00 (0.00)	24	58.5%	0.00 (0.00)	31	67.4%
Occupational therapist visits						
Baseline	0.04 (0.19)	22	28.6%	0.04 (0.20)	26	33.8%
8 weeks	0.00 (0.00)	41	53.2%	0.00 (0.00)	44	57.1%
16 weeks	0.00 (0.00)	42	54.5%	0.00 (0.00)	44	57.1%
24 weeks	0.00 (0.00)	24	58.5%	0.00 (0.00)	31	67.4%
Physiotherapist visits						
Baseline	0.18 (0.98)	22	28.6%	0.04 (0.20)	27	35.1%
8 weeks	0.03 (0.17)	41	53.2%	0.30 (1.24)	44	57.1%
16 weeks	0.00 (0.00)	40	51.9%	0.24 (1.09)	44	57.1%
24 weeks	0.24 (0.56)	24	58.5%	0.00 (0.00)	31	67.4%
Other health service visits						
Baseline	0.14 (0.44)	21	27.3%	0.08 (0.33)	25	32.5%
8 weeks	0.11 (0.66)	40	51.9%	0.06 (0.25)	45	58.4%
16 weeks	0.41 (0.98)	40	51.9%	0.09 (0.29)	44	57.1%
24 weeks	0.29 (0.99)	24	58.5%	0.20 (0.41)	31	67.4%
Inpatient nights in hospital						
Baseline	0.90 (5.89)	25	32.5%	0.33 (1.10)	37	48.1%
8 weeks	0.03 (0.17)	43	55.8%	0.00 (0.00)	45	58.4%
16 weeks	0.19 (0.71)	41	53.2%	0.00 (0.00)	44	57.1%
24 weeks	0.00 (0.00)	22	53.7%	0.00 (0.00)	32	69.6%
Day case visits to hospital						
Baseline	0.00 (0.00)	23	29.9%	0.07 (0.26)	35	45.5%
8 weeks	0.00 (0.00)	41	53.2%	0.00 (0.00)	45	58.4%
16 weeks	0.03 (0.17)	41	53.2%	0.09 (0.38)	44	57.1%
24 weeks	0.00 (0.00)	23	56.1%	0.07 (0.27)	32	69.6%
Outpatient attendances						
Baseline	0.46 (1.53)	25	32.5%	0.12 (0.40)	36	46.8%
8 weeks	0.12 (0.54)	43	55.8%	0.07 (0.25)	47	61.0%
16 weeks	0.22 (0.71)	40	51.9%	0.19 (0.59)	45	58.4%
24 weeks	0.33 (0.97)	23	56.1%	0.29 (0.61)	32	69.6%
A&E visits						
Baseline	0.04 (0.28)	26	33.8%	0.05 (0.21)	34	44.2%

8 weeks	0.00 (0.00)	42	54.5%	0.03 (0.18)	45	58.4%
16 weeks	0.03 (0.17)	21	27.3%	0.00 (0.00)	46	59.7%
24 weeks	0.00 (0.00)	23	56.1%	0.00 (0.00)	32	69.6%
Physio hospital attendances						
Baseline	0.13 (0.97)	25	32.5%	0.18 (0.96)	37	48.1%
8 weeks	0.00 (0.00)	42	54.5%	0.14 (0.76)	49	63.6%
16 weeks	0.00 (0.00)	41	53.2%	0.07 (0.37)	47	61.0%
24 weeks	0.56 (0.24)	23	56.1%	0.00 (0.00)	32	69.6%

Table 46: Summary of costs accrued at 8 weeks and 16 weeks (in relation to another reason)

	Hip (n=77)				**Knee (n=77)**			
	Baseline to 8 weeks		**8 weeks to 16 weeks**		**Baseline to 8 weeks**		**8 weeks to 16 weeks**	
Cost item	**Mean Cost (£) (SD)**	**N**	**Mean Cost (£) (SD)**	**N**	**Mean Cost (£) (SD)**	**N**	**Mean Cost (£) (SD)**	**N**
GP visits at GP practice	10.83 (19.26)	38	21.10 (23.96)	39	19.80 (27.98)	34	20.30 (43.83)	35
GP visits at home	0.00 (0.00)	37	5.20 (31.20)	36	0.00 (0.00)	34	17.02 (97.76)	33
Nurse visits at GP practice	2.57 (6.88)	38	4.40 (8.27)	37	3.62 (7.78)	36	2.96 (6.23)	33
Community nurse visits - home	0.00 (0.00)	37	29.10 (177.01)	37	0.00 (0.00)	33	0.00 (0.00)	33
Occupational therapist visits	0.00 (0.00)	36	0.00 (0.00)	35	0.00 (0.00)	33	0.00 (0.00)	33
Physiotherapist visits	49.79 (82.41)	46	0.00 (0.00)	37	210.42 (139.88)	40	13.88 (62.44)	33
Other health service visits	8.01 (48.74)	37	30.05 (72.99)	37	4.63 (18.23)	32	6.74 (21.64)	33
Inpatient nights in hospital	10.17 (59.30)	34	67.23 (245.45)	36	0.00 (0.00)	32	0.00 (0.00)	33
Day case visits to hospital	0.00 (0.00)	36	20.61 (123.68)	36	0.00 (0.00)	32	67.46 (285.22)	33
Outpatient attendances	14.71 (67.18)	34	27.03 (89.06)	37	8.33 (31.72)	30	23.44 (74.04)	32
A&E visits	0.00 (0.00)	35	4.45 (26.72)	36	5.01 (28.34)	32	0.00 (0.00)	31
Physio hospital attendances	0.00 (0.00)	35	0.00 (0.00)	36	7.84 (41.51)	28	3.66 (20.05)	30
Total Costs	**38.13 (93.73)**	**29**	**163.95 (337.09)**	**32**	**55.95 (118.36)**	**25**	**170.69 (404.38)**	**29**

Table 47: Mean (SD) resource use up to 16 weeks follow-up for complete cases (in relation to your joint replacement)

	Hip		Knee	
	N	**Mean (SD)**	**N**	**Mean (SD)**
GP visits at GP practice	32	0.50 (0.95)	24	0.46 (0.78)
GP visits at home	31	0.00 (0.00)	24	0.00 (0.00)
Nurse visits at GP practice	32	0.56 (0.91)	24	0.88 (1.36)
Community nurse visits at home	31	1.13 (5.04)	24	0.67 (2.35)
Occupational therapist visits	32	0.34 (0.70)	23	0.22 (0.60)
Physiotherapist visits	30	1.43 (1.89)	26	6.04 (4.49)
Other health service visits	29	0.35 (0.81)	23	0.22 (0.52)
Inpatient nights in hospital	34	3.68 (3.42)	26	3.31 (2.57)
Day case visits to hospital	32	0.00 (0.00)	23	0.04 (0.21)
Outpatient attendances	33	1.70 (1.42)	24	1.38 (1.35)
A&E visits	30	0.03 (0.18)	23	0.17 (0.58)
Physio hospital attendances	31	2.19 (2.65)	24	4.38 (3.68)
Occupational health RTW advice	33	0.15 (0.51)	25	0.00 (0.00)
Employer RTW advice	33	0.18 (0.39)	25	0.16 (0.47)

i.e. for each resource item participants with complete data on this resource at 8 and 16 weeks

Table 48: Mean (SD) resource use up to 16 weeks follow-up for complete cases (in relation to 'another reason')

	Hip		Knee	
	N	**Mean (SD)**	**N**	**Mean (SD)**
GP visits at GP practice	23	0.87 (0.92)	17	0.94 (1.43)
GP visits at home	21	0.95 (0.44)	15	0.40 (1.55)
Nurse visits at GP practice	22	0.64 (1.22)	15	0.87 (1.55)
Community nurse visits at home	21	0.00 (0.00)	15	0.00 (0.00)
Occupational therapist visits	20	0.00 (0.00)	15	0.00 (0.00)
Physiotherapist visits	20	0.05 (0.22)	15	0.40 (1.55)
Other health service visits	22	0.68 (1.86)	16	0.13 (0.34)
Inpatient nights in hospital	22	0.00 (0.00)	16	0.00 (0.00)
Day case visits to hospital	23	0.04 (0.21)	16	0.06 (0.25)
Outpatient attendances	22	0.41 (1.50)	15	0.33 (0.82)
A&E visits	22	0.05 (0.21)	16	0.00 (0.00)
Physio hospital attendances	21	0.00 (0.00)	15	0.00 (0.00)

i.e. for each resource item participants with complete data on this resource at 8 and 16 weeks

Table 49: Summary of costs to 16 week follow up for complete cases (in relation to your joint replacement)

Cost Item	Hip		Knee	
	N	Total mean cost £ (SD)	N	Total mean cost £ (SD)
GP visits at GP practice	32	18.70 (35.54)	24	17.14 (29.14)
GP visits at home	31	0.00 (0.00)	24	0.00 (0.00)
Nurse visits at GP practice	32	6.10 (9.91)	24	9.49 (14.77)
Community nurse visits at home	31	43.42 (193.99)	24	25.64 (90.48)
Occupational therapist visits	32	16.16 (32.93)	23	10.22 (28.19)
Physiotherapist visits	30	82.07 (108.10)	26	345.74 (257.32)
Other health service visits	29	25.56 (60.33)	23	16.11 (38.42)
Inpatient nights in hospital	34	1490.20 (1385.28)	26	1340.73 (1043.02)
Day case visits to hospital	32	0.00 (0.00)	23	59.43 (285.02)
Outpatient attendances	33	246.94 (207.34)	24	200.08 (195.76)
A&E visits	30	5.34 (29.27)	23	27.88 (92.38)
Physio hospital attendances	31	120.45 (145.57)	24	240.23 (202.11)
Occupational health RTW advice	33	0.65 (2.18)	25	0.00 (0.00)
Employer RTW advice	33	0.71 (1.52)	25	0.62 (1.84)

Table 50: Summary of costs to 16 week follow up for complete cases (in relation to 'another reason')

Cost Item	Hip		Knee	
	N	Total mean cost £ (SD)	N	Total mean cost £ (SD)
GP visits at GP practice	23	32.52 (34.40)	17	35.20 (53.66)
GP visits at home	21	8.91 (40.85)	15	37.44 (145.00)
Nurse visits at GP practice	22	6.90 (13.20)	15	9.40 (16.84)
Community nurse visits at home	21	0.00 (0.00)	15	0.00 (0.00)
Occupational therapist visits	20	0.00 (0.00)	15	0.00 (0.00)
Physiotherapist visits	20	2.86 (12.80)	15	22.90 (88.70)
Other health service visits	22	50.53 (137.96)	16	9.26 (25.31)
Inpatient nights in hospital	22	0.00 (0.00)	16	0.00 (0.00)
Day case visits to hospital	23	32.26 (154.74)	16	46.38 (185.52)
Outpatient attendances	22	51.14 (187.65)	15	41.67 (102.07)
A&E visits	22	7.29 (34.18)	16	0.00 (0.00)
Physio hospital attendances	21	0.00 (0.00)	15	0.00 (0.00)

Table 51: Summary of EQ-5D utility scores at each time point (all available cases)

Utility	Hip (n =77)		Knee (n =77)	
Follow up	N	Mean (SD)	N	Mean (SD)
Baseline (4 weeks pre-surgery)	71	0.312 (0.317)	71	0.471 (0.220)
Baseline (today)	72	0.359 (0.283)	73	0.298 (0.301)
8 weeks	50	0.675 (0.215)	42	0.693 (0.110)
16 weeks	47	0.771 (0.236)	45	0.734 (0.196)
24 weeks	21	0.723 (0.321)	18	0.762 (0.171)

Table 52: Summary of EQ-VAS scores at each time point (all available cases)

	Hip					Knee				
	Baseline (4-weeks pre-surgery)	Baseline (today)	8 weeks	16 weeks	24 weeks	Baseline (4-weeks pre-surgery)	Baseline (today)	8 weeks	16 weeks	24 weeks
Mean EQ VAS score (SD)	52.4 (26.0)	60.0 (20.9)	75.3 (17.6)	79.7 (17.7)	77.0 (21.3)	64.9 (21.1)	61.6 (20.9)	73.6 (19.7)	78.5 (15.7)	80.2 (14.9)
Median EQ VAS score (IQR)	50 (30,75)	65 (50,75)	78 (65,90)	85 (70,90)	87 (65,90)	70 (50,80)	65 (50,80)	75 (70,85)	85 (70,90)	81 (70,95)

Table 53: EQ-5D questionnaire return rates and missing data

Follow up	Completed EQ-5D		Missing EQ-5D (≥1 dimension missing)	
	Hip (n = 77)	Knee (n = 77)	Hip (n = 77)	Knee (n = 77)
Baseline (4weeks pre-surgery)	71 (92%)	71 (92%)	6 (8%)	6 (8%)
Baseline (today)	72 (94%)	73 (95%)	5 (7%)	4 (5%)
8 weeks	50 (65%)	42 (55%)	27 (35%)	35 (46%)
16 weeks	47 (61%)	45 (58%)	30 (39%)	32 (42%)
24 weeks *Note: 24w sent to a subset of 87 participants*	N= 41 21 (51%)	N= 46 18 (39%)	N = 41 20 (49%)	N = 46 28 (61%)

Table 54: Number of missing dimensions for invalid EQ-5D questionnaires

EQ-5D	Hip: Number of missing dimensions					Knee: Number of missing dimensions				
Follow up	1	2	3	4	5	1	2	3	4	5
Baseline* (today)	2	0	1	0	2	1	0	0	0	3
8 weeks	0	0	0	0	27	1	0	0	0	34
16 weeks	0	0	0	0	30	2	0	0	0	30
24 weeks	0	0	0	0	20	0	0	0	0	28

* At baseline (4-weeks pre-surgery): for hip participants, 2 participants had 1 dimension missing and 4 participants had 5 dimensions missing. For knee participants, 1 had 1 dimension missing and 5 had 5 dimensions missing.

Table 55: Proportion reporting EQ-5D-5L levels 1 to 5 by dimension and time point for *hip* replacement patients

EQ-5D scale	Health state Severity*	Hip									
		Baseline (4-weeks pre-surgery)		Baseline (today)		8 weeks		16 weeks		24 weeks	
Mobility	Level 1	1	1.3%	2	2.6%	16	20.8%	25	32.5%	12	29.3%
	Level 2	6	7.8%	11	14.3%	17	22.1%	9	11.7%	2	4.9%
	Level 3	27	35.1%	30	39.0%	17	22.1%	11	14.3%	4	9.8%
	Level 4	37	48.1%	27	35.1%	0	0.0%	2	2.6%	3	7.3%
	Level 5	2	2.6%	4	5.2%	0	0.0%	0	0.0%	0	0.0%
	Missing	4	5.2%	3	3.9%	27	35.1%	30	39.0%	20	48.8%
No. reporting any problems		72		72		34		22		9	
		98.6%		97.30%		68.00%		46.81%		42.9%	
Self-care	Level 1	10	13.0%	11	14.3%	30	39.0%	36	46.8%	15	36.6%
	Level 2	25	32.5%	19	24.7%	12	15.6%	7	9.1%	3	7.3%
	Level 3	27	35.1%	29	37.7%	6	7.8%	3	3.9%	2	4.9%
	Level 4	10	13.0%	14	18.2%	2	2.6%	0	0.0%	0	0.0%
	Level 5	1	1.3%	2	2.6%	0	0.0%	1	1.3%	1	2.4%
	Missing	4	5.2%	2	2.6%	27	35.1%	30	39.0%	20	48.8%
No. reporting any problems		63		64		20		11		6	
		86.3%		85.33%		40.00%		23.40%		28.6%	
Usual activities	Level 1	2	2.6%	2	2.6%	12	15.6%	27	35.1%	10	24.4%
	Level 2	15	19.5%	10	13.0%	21	27.3%	10	13.0%	7	17.1%
	Level 3	26	33.8%	24	31.2%	11	14.3%	7	9.1%	2	4.9%
	Level 4	20	26.0%	19	24.7%	3	3.9%	1	1.3%	1	2.4%
	Level 5	9	11.7%	18	23.4%	3	3.9%	2	2.6%	1	2.4%
	Missing	5	6.5%	4	5.2%	27	35.1%	30	39.0%	20	48.8%
No. reporting any problems		70		71		38		20		11	
		97.2%		97.26%		76.00%		42.55%		52.4%	
Pain/ discomfort	Level 1	0	0.0%	1	1.3%	11	14.3%	20	26.0%	8	19.5%
	Level 2	4	5.2%	4	5.2%	23	29.9%	16	20.8%	7	17.1%
	Level 3	30	39.0%	40	51.9%	15	19.5%	9	11.7%	5	12.2%
	Level 4	22	28.6%	21	27.3%	1	1.3%	2	2.6%	0	0.0%
	Level 5	17	22.1%	8	10.4%	0	0.0%	0	0.0%	1	2.4%
	Missing	4	5.2%	3	3.9%	27	35.1%	30	39.0%	20	48.8%
No. reporting any problems		73		73		39		27		13	

		100.0%		98.65%		78.00%		57.45%		61.9%	
Anxiety/ depression	Level 1	31	40.3%	37	48.1%	30	39.0%	35	45.5%	15	36.6%
	Level 2	19	24.7%	26	33.8%	11	14.3%	9	11.7%	4	9.8%
	Level 3	13	16.9%	7	9.1%	8	10.4%	2	2.6%	0	0.0%
	Level 4	5	6.5%	3	3.9%	0	0.0%	1	1.3%	1	2.4%
	Level 5	4	5.2%	1	1.3%	1	1.3%	0	0.0%	1	2.4%
	Missing	5	6.5%	3	3.9%	27	35.1%	30	39.0%	20	48.8%
No. reporting any problems		41		37		20		12		6	
		57.0%		50.00%		40.00%		25.53%		28.6%	

* Level 1 - no problems; level 2 – slight problems; level 3 – moderate problems; level 4 – severe problems; level 5 – extreme problems

Table 56: Proportion reporting EQ-5D-5L levels 1 to 5 by dimension and time point for *knee* replacement patients

EQ-5D scale	Health state Severity*	Knee									
		Baseline (4-weeks pre-surgery)		Baseline (today)		8 weeks		16 weeks		24 weeks	
Mobility	Level 1	1	1.3%	1	1.3%	9	11.7%	19	24.7%	8	17.4%
	Level 2	9	11.7%	10	13.0%	21	27.3%	20	26.0%	5	10.9%
	Level 3	31	40.3%	17	22.1%	10	13.0%	6	7.8%	5	10.9%
	Level 4	31	40.3%	34	44.2%	3	3.9%	2	2.6%	0	0.0%
	Level 5	0	0.0%	11	14.3%	0	0.0%	0	0.0%	0	0.0%
	Missing	5	6.5%	4	5.2%	34	44.2%	30	39.0%	28	60.9%
No. reporting any problems		71		72		34		28		10	
		98.6%		98.63%		79.07%		59.57%		55.6%	
Self-care	Level 1	37	48.1%	18	23.4%	32	41.6%	35	45.5%	16	34.8%
	Level 2	14	18.2%	16	20.8%	8	10.4%	9	11.7%	2	4.3%
	Level 3	18	23.4%	29	37.7%	3	3.9%	3	3.9%	0	0.0%
	Level 4	2	2.6%	9	11.7%	0	0.0%	0	0.0%	0	0.0%
	Level 5	1	1.3%	2	2.6%	0	0.0%	0	0.0%	0	0.0%
	Missing	5	6.5%	3	3.9%	34	44.2%	30	39.0%	28	60.9%
No. reporting any problems		35		56		11		12		2	
		48.6%		75.68%		25.58%		25.53%		11.1%	
Usual activities	Level 1	6	7.8%	2	2.6%	10	13.0%	19	24.7%	7	15.2%
	Level 2	15	19.5%	14	18.2%	18	23.4%	20	26.0%	6	13.0%
	Level 3	32	41.6%	23	29.9%	14	18.2%	6	7.8%	4	8.7%
	Level 4	16	20.8%	13	16.9%	0	0.0%	2	2.6%	1	2.2%
	Level 5	3	3.9%	22	28.6%	1	1.3%	0	0.0%	0	0.0%
	Missing	5	6.5%	3	3.9%	34	44.2%	30	39.0%	28	60.9%
No. reporting any problems		66		72		33		28		11	
		91.7%		97.30%		76.74%		59.57%		61.1%	
Pain/ discomfort	Level 1	0	0.0%	0	0.0%	1	1.3%	8	10.4%	4	8.7%
	Level 2	11	14.3%	3	3.9%	28	36.4%	24	31.2%	11	23.9%
	Level 3	27	35.1%	28	36.4%	14	18.2%	11	14.3%	2	4.3%
	Level 4	29	37.7%	32	41.6%	0	0.0%	2	2.6%	1	2.2%
	Level 5	4	5.2%	11	14.3%	0	0.0%	1	1.3%	0	0.0%
	Missing	6	7.8%	3	3.9%	34	44.2%	31	40.3%	28	60.9%
No. reporting any problems		71		73		42		38		14	

		100.0%		100.0%		97.67%		82.61%		77.8%	
Anxiety/ depression	Level 1	43	55.8%	51	66.2%	31	40.3%	32	41.6%	14	30.4%
	Level 2	16	20.8%	13	16.9%	9	11.7%	9	11.7%	2	4.3%
	Level 3	12	15.6%	7	9.1%	2	2.6%	5	6.5%	2	4.3%
	Level 4	1	1.3%	2	2.6%	0	0.0%	0	0.0%	0	0.0%
	Level 5	0	0.0%	1	1.3%	0	0.0%	0	0.0%	0	0.0%
	Missing	5	6.5%	3	3.9%	35	45.5%	31	40.3%	28	60.9%
No. reporting any problems		29		23		11		14		4	
		40.3%		31.08%		26.19%		30.43%		22.2%	

* Level 1 - no problems; level 2 – slight problems; level 3 – moderate problems; level 4 – severe problems; level 5 – extreme problems

Section 4: Supplementary material for the survey of practice

Table 57: Survey responses for hospital orthopaedic team members

Question	Survey group	Yes	Sometimes	No	Don't know / No response
Are patients in work and intending to return to work after surgery identified as a specific subset of patients for additional advice and information at any point during their care episode?	Orthopaedic Surgeons	8	-	59	11
	Physiotherapists	5	-	13	2
	Occupational therapists	8	-	12	5
	Nurse / Specialist nurse / ESP	9	-	8	8
	TOTAL (n=148)	30 (20%)	-	92 (62%)	26 (18%)
Do patients in work and intending to return to work after surgery receive additional advice and support during their inpatient stay or after discharge?	Orthopaedic Surgeons	6	-	58	14
	Physiotherapists	5	-	14	1
	Occupational therapists	5	-	15	5
	Nurse / Specialist nurse / ESP	10	-	5	10
	TOTAL (n=148)	26 (18%)	-	92 (62%)	30 (20%)
Do you feel an occupational advice intervention is needed?	Orthopaedic Surgeons	20	40	11	7
	Physiotherapists	2	14	1	3
	Occupational therapists	9	12	0	4
	Nurse / Specialist nurse / ESP	7	12	0	6
	TOTAL (n=148)	38 (26%)	78 (52%)	12 (8%)	20 (14%)

Table 58: Example quotations from various interviewees from the survey of practice

Interviewee:	**Examples of advice:**
Orthopaedic Surgeons	*"3 months is the national agreed time off work"* *"Advice is based on personal judgement only"* *"If in doubt I suggest that they are assessed via their employer's occupational health team"* "*A lot depends on the job, sometimes it has to be left to the company's occupational health department"*
Physiotherapists	*"Our Hip School gives advice but not individualised to each patient's occupation"* *"I would ask the patient to seek advice from their surgeon"*
Occupational Therapist	*"If patient is in a heavy job, we advise that it is likely to be a total of 3 months before they can return to work unless they can moderate activities in a phased return"* *"We suggest 6-12 weeks before returning to work. Advice is given generically as part of class rather than on an individual basis"* "*Advice is tailored for each individual as occupations and the work environment invariably differ"*
Nurse/Specialist Nurse/Extended Scope Practitioner	*"Patients are advised not to return to work until after their 6 week review appointment with their surgeon* *"Advice is given dependent upon the occupation"* *"We usually re-iterate what advice has been given by their consultant"* *"They are advised that return to work is dependent on the job they do so length of time off work can vary from person to person"*

Appendix 4: Supporting information for the patient interviews (IM Stage 1)

Section 1: Interview schedules

Patient interview schedule

- Thank you for taking the time to meet with us today.
- Have you read the information leaflet and informed consent form? Do you have any questions before we start? There are no right or wrong answers and you don't have to answer any questions that you don't feel comfortable talking about. If it's ok with you, we will use a digital audio recorder to ensure that the interview is accurately documented. Everything you say will be kept confidential and anonymous. Your name will not be mentioned on any published documents, and therefore anything you say cannot be identified as coming from you. Any names of individuals or places that you might refer to during the interview will be anonymised when transcribed. The recording will be stored securely at the University of Nottingham.
- You are welcome to request a copy of your interview transcript if you would like to review it for clarification, to add to it, or to indicate that all or part of it should not be used.

Table 59: Patient interview schedule

Topic area	Question	Prompts
Personal information	Can you tell me about yourself?	Health, home, family, work, hobbies, interests. Usual work and other activities. Driving (may be relevant to work)
Relevant experience	What has been your experience of RTW/RUA following knee or hip replacement?	Who else has been involved –e.g. GP, AHPs, OH, managers, HR, Fit for Work Services, family When and how are they involved – how effective are they? What has happened re RTW/RUA and when?
Perceived obstacles/facilitators	What things make/could make it difficult for patients who have had knee or hip replacement to RTW/RUA? What things make/could make it easier for patients who have had knee or hip replacement to RTW/RTUA? What helps/would help you and other patients to RTW/RUA?	<u>Information-related</u> Extent of sufficient/consistent/useful information/advice for patients/GPs/employers on RTW/RUA following surgery. What needed? How information/advice should be delivered/accessed? When? By whom? <u>Patient-related</u> Motivation/attitude/beliefs/expectations re RTW/RUA including self-efficacy, anxiety. Sick leave history/absence Extent of functional ability prior to surgery Life context – age, home circumstances, travel to work. Family roles and responsibilities. Work-life balance. Financial circumstances. Transferable skills Co-morbidities Adherence/compliance with advice/support Symptom management <u>Workplace-related</u> Relationships Workplace/managerial support Workplace conditions – environment, pace,

		tasks, job demands, shifts/hours, travel, availability of adjustments/redeployment, culture, sick pay/absence policies. Equipment <u>Activity outside workplace</u> Physical and mental demands of UA (including PADL, DADL, hobbies, interests, family roles and responsibilities, social activities) <u>RTW management</u> Communication/transfer of information between key players. How conducted, by who, when? Extent of an agreed RTW plan Co-ordination of RTW Key players' skill in RTW management <u>Societal</u> Economic factors/conditions – local, national <u>Surgery related</u> Waiting times/delays to surgery Surgical approach/type of operation/components used Experience/ability of surgeon Complications/consequences Restrictions/precautions Extent of focus on activity pre and post op Information about procedure/resumption of activity Certainty of timescales Extent of consistent/tailored advice and support re RTW/RUA provided by clinicians/AHPs Follow-up/post op rehab
Occupational intervention	What would an occupational intervention for patients look like?	Who would deliver? Individual/team/profession/expertise When, how? Where? Ward – outpatient clinic, community Format – paper, on-line, phone apps, one-to-one sessions Components – assessment, advice, information, liaison, signposting, workplace visits
Outcome measurement	We are developing an intervention to help people RTW/RUA after surgery. How do you think we might best measure the effectiveness of the intervention from your perspective?	Functional performance Duration of sick leave Sustained RTW/RUA Wellbeing
Is there anything else that you would like to say that we haven't already discussed?		

Section 2: Characteristics of patient interviewees

Table 60: Occupations of the patient participants

Occupations of patient participants	
Petrol station operative	Book keeper
NHS Secretary	Curate
IT manager	Re enablement officer
Engine technician	Test and development engineer
Mechanical maintenance fitter	Warehouse operative
Teaching assistant	RAF Medic
Tax manager	Post office clerk
Healthcare assistant	Medical secretary
Supermarket worker	Litho printer
Production supervisor	Company director
Social worker	Speech and language consultant
Social worker	Transport manager
Builder	Off shore rigger
Family business/education adviser	Care worker
Cleaner	Stone mason
Teaching assistant	Bricklayer
Social worker	Maintenance engineer
NHS ward clerk	Family carer
Shop manager	Farmer
Mechanic	Volunteer ambulance driver
School lunchtime supervisor	Bank clerk
Technical author	Undertaker's assistant
Nurse	

Section 3: Patient interview quotations

As described in Chapter 5, patient interviews produced the following six themes:

- Pre-operative context
- Post-operative context
- Advice received
- GP role and fit note
- Barriers and facilitators to return to work
- Perceptions of an occupational advice intervention

Direct quotations to supplement the narrative description in chapter 5 are presented below:

THEME: The preoperative context

I was off two weeks before I had my operation on 6th of February because the cleaning was just too much for us with the pain in my leg, and I had stumbled a couple of times and had a fall before that. And the head was a bit too worried with working with small children as well, I didn't want to be injuring myself before I had the operation (1302)

And before the operation I couldn't bend down to put my work boots on, my wife was having to do that, and to put my socks on. (1204).

I'd have let them chop my leg off. Because it just gets you down… I said to the boss before I had it done, when she came to see me when I was back at home, I said I was really at the end of my tether, I'd had enough (1206).

So it was just no good for work, so I thought I might as well just bite the bullet and get it done… they said well just take painkillers. I said that's no good, because it doesn't stop the pain. It just niggles all the time constantly. I couldn't get any sleep because of it…I said well the way it is now I'll not be able work within another two or three months anyway. (2301).

I work as a tax manager and an accountant…so January tax return deadline I had to try and get it so that the appointment within the eight-week period fell preferably after the end of January… I just wouldn't conceivably be able to have the time off work around November/December time... I just couldn't afford to have six weeks off work at the time… so I'm the only person doing the tax. (1023).

THEME: The postoperative context

I asked for it (fit note) and they didn't get it organised and then on the day I was leaving they still hadn't got it organised. So I then had to phone up the GP and get the GP to sort me one out……. And it was the same with the medication, there was a mix up with the medication as well, so they just sent me home with paracetamol, which didn't do anything….And it just amazed me, the test that they do to decide that you're fit to go home, because one of the key things is whether you can get upstairs, well … they test you going up two steps. Well that in reality is totally different from getting up a whole flight of stairs. (1107)

I have to say I was very disappointed with what the NHS physio service was like. My first appointment was at four weeks… So they looked at mobility rather than strength and stuff like that. My leg is still very weak and to my mind that's keeping me from doing more stuff… But if I wasn't paying physio to monitor what I was doing, I probably wouldn't have ever done more strengthening exercises (2009).

I always knew that I would be working anyway. I had no intentions of not working totally. I always knew I was going to be on the telephone and talking to clients and things like that (2201).

I also tried to do bits and pieces of work at home because I got a laptop from work so I was at home for four weeks and I still wasn't able to drive at that particular time but my mobility was pretty much OK for me to walk about. I had no issues with walking and climbing stairs or anything like that, so my manager actually at work would come and pick me up in the morning and bring me into work and then drop me home at night. (1105)

THEME: Advice received

… there wasn't very much about going back to work. (2009)

He actually said to me, are you driving? I'm like well, no, because I was told I had to get clearance from you to allow me to drive. He said well, look at you, you're doing remarkably well, I'm delighted with your progress, you could have been driving. (1105).

You get conflicting [advice], like I said with the running. The surgeon said you can run, the person I saw, and then the physios say whatever you do, you can't run.

Well I sort of had a rough idea, they said like possibly three months. But basically that's all I got told. You'll be able to go back to work after three months really. That's all I got told really to be honest (1231).

No, for me, it [information pack] answered all my questions and it was OK as a reference… it was quite nice having something to refer to. (2013)

THEME: The GP role and fit notes

I'm very pleased generally with my GP. He checked my knee all over, but obviously they're not a specialist. So he referred me on, and he said he wasn't very happy with it. But he did look at the x-ray as well. He looked at the x-ray and said that don't look very good at all sort of thing. And said we need to look at seeing an orthopaedic surgeon basically. So yeah, I'm quite happy with the way they did things, they did it properly really. (2105)

There's very limited contact at all (with GP). The only real contact was to request a sick note and pain relief. (2002)
I think I was meant to get them [fit notes] from the hospital but I never ever got one. I had to go to my GP and get them from him (1005)

..she wanted to give me a longer one and I just said, we compromised. She said eight weeks, I said oh no can you just give me it for four weeks? And she said well what about six weeks? I said no if we have four weeks, and then hopefully I might be able to go back. Anyway we compromised on the four weeks and she'd said to me when you go back you go back on phased return, I don't want you working you know, and just discuss it your line manager. But at the end of the four weeks I found I was able to go back. So that was the end of her input. (1229)

I didn't have a sick note, no. They just said look, you're off for three months. I'm self-employed, I didn't require a sick note. Now, if I'd been employed, I would have asked for one, obviously. I would

have said look, I need a sick note that says I'm off for three months to give to my gaffer, my boss. But because I didn't require one, it wasn't a problem really. (2201)

THEME: Workplace barriers and facilitators to work

Prior to surgery

I didn't tell him until I was actually on the waiting list. I didn't think there was any point. I wasn't having time off work with the hip, but I did need to let him know as soon as I went on the waiting list. I said I've got this problem and in three months' time hopefully I shall be having the op and then I'll be off for six weeks to give him notice. (1003)

Well obviously I rang him up straightaway. And he was very understanding. He was more concerned that things had gone wrong for me than actually the implications at work, well that's how he came across. Maybe what he said once I'd put the phone down, but actually no he was very good. So no, they were helpful. One of the things I suppose visually for my employer as well is that when I'd seen the consultant he actually said take some photographs of your x-rays. So I actually had them on my phone (1005)

I did say I was going to have another knee operation because it was so bad. And they were fine…They didn't know I was going to have another one until the last minute, I never told them until it got so painful... (2101)

Following surgery

I think they must have procedures. Once you're off after two weeks or three weeks, then they must, or 12 weeks. Because I had someone from HR come after my operation, after about two weeks you see to see me, to ask me questions and things like that. (1231)

It was all me that was doing, that was telling them and advising them on how long I was going to be off. (1204)

….I had open discussions with my boss about this, and his biggest concern was to keep the HR people off his back and making sure that I could give him as much as possible to help him in that process. It was a joint effort against HR….. Even though I had a sick note in place, and even though they had dates supported by that note and obviously health professionals, they were still chasing my boss' boss every week…….. Again that's because they've applied a blanket policy rather than considering individuals and the varying responsibilities. (2002)

I did get a visit from the service manager and a lady from HR. That was the week, two actually. It was probably two weeks before I was due to go back because that's when I said I've got my sick notes. It runs out and I'm going to return to work on 13th and it was probably something like 9th, or something like that, and the HR lady said you can't come back until we arrange for you to see the occupational therapist (health). (1228)

Job Demands

It's quite demanding, climbing on roofs and going down the voids underneath, and climbing ladders and climbing into the back of machinery and vents and everything like that…Eight until four Monday to Friday. (1012)

…the job that I had with a lot of restraints, up and down from the floor and things quite a lot would also not do the hips a lot of good.....As it was, I was getting by at work. If we ended up having a

restraint, I'd be in quite a lot of pain afterwards, especially if it was one that went to the floor and then getting back up from the floor. (1101)

I'm up and down on my seat, but I am in the banking hall as well as serving customers. And there's a lot of coin and change involved, so lifting bags of change yeah… (2318)

I think for work the reason might have been risk to myself of maybe falling or, you know, with working in a tight situation and like my first job's with very small children in a dining room, in a playground and I've got to be able to move around fairly quickly (1302)

walking across a [construction] site that can be quite uneven covered in bits, stones, you know, it's very uneven ground it did make me very aware that it's a quite a dangerous industry anyway and you do need to be fit (2201)

Line Management

So I was very keen to get back, which the vicar knew, very keen to get back to some aspect of ministry that I could do. And he was aware that in the short term that there were things that I would be less likely to do, and then working towards as I progressed in mobility and so on working towards going back into doing anything that needed to be done within reason. (1319)

I sorted it with my employer because I'm only part-time and he's very accommodating and I had no - if I'd had a different type of job, obviously I think I would have thought differently. But I went back to work knowing that if I couldn't cope I could come home. I went back at the right time and I had lots of support from him. (2013)

Probably being more around to talk to me, you know, it's like I was told by my line manager that I couldn't use a walking stick in school because of insurance reasons. And then I had the meeting with the head of the school and my line manager, and the head of the school said I can use my walking stick. So it's things like that, it has got me a little bit annoyed, because then I wouldn't have had been pushing myself and straining with walking without my stick. (1018)

Policies and Procedures

And obviously [employer name] are scared of litigation, simple as that. That's why they won't let me go back until I'm fit for work, until the doctor says you're fit. Litigation, because if I fall, have an accident, all I've got to do is say well they made me come back and that's it, I can sue them, job done. (1011)

…It comes from management down unfortunately that's the decision they've made, that they want it to be totally hot-desking. So it's all down to work and work environment optimisation. And they don't make any allowances.

…the manager there at that site was very helpful, his hands were tied because he isn't, he is in charge of that plant, the directors are based somewhere else that say, no, we're not employing anyone else and that's a decision that he has to live with. (2303)

Sick Pay and Sick Leave

And the other good thing as well is the time off I had post-surgery doesn't go against my sickness record. Whereas some places it would go on your sickness record that you've been off for so many… No, they've got those 45 days down on my record, but it doesn't trigger the sickness management procedure. (1107)

Well, I wouldn't, I won't sign on the sick. I wouldn't sign on because with us working before, my kind of work, now I can only work so long, we're going to get tax money back, a rebate, so much. But if you sign on sick money or unemployment in the year you can't get it back until the next month, because you have to tax to pay on your sick money. Now, I didn't know until they told me - the tax office - so yes I was off for a few weeks. They would send me £3 a week, that's all I got. And she says out of that it's added up the end of the year on your wages, and you pay 20% tax on it, back to the Government. Well I said it's not worth, firstly it's not worth then for £59 a week it worked out at, I said I just wouldn't go to all the hassle and all the what goes on with it. So, you didn't bother to do any of that? No, I never bothered. I lived off what I'd earned. (2209)

I get three days sick pay from my employer and then I go on to statutory sick. I couldn't afford to maintain myself on that because obviously I've got my overheads to pay. So I then had to allocate holiday and I also tried to do bits and pieces of work at home because I got a laptop from work so I was at home for four weeks and I still wasn't able to drive at that particular time but my mobility was pretty much OK for me to walk about. (1105)

….because in January I was fine. February I only got £800. March I only got …[unclear]. April I only got £400 I think, so I had to go back. (2004)

Yes, well normally with working for the council you're off for six months with full pay, and then after that you go on half pay. So I'm now on half pay until October. (1332)

Colleagues

Yeah, they all like mucked in…. they're all saying I'll take that out for you. I go no it's all right, I can do it myself…I mean I know if I need help I'd only have to ask. (1206)

Yeah, they've been OK, because they've had cover from the very beginning, so nobody's doing outside, more than what they have to, they've covered it so everything's just fine it's been covered. Because I know when you're off sometimes somebody else gets your workload, it cannot be very good, but it's been all covered. (1307)

Yeah they all say oh mind your leg and things like that. I say I'm all right, yeah. Oh yeah, people I work with yeah, yeah, they are very supportive but you know they'll say I'll go and do that, so, you know, at the end of the corridor and things like that. (2210)

And so because my role changed a little bit. Instead of being a guy who puts engines together, I was a guy who was on the computer sorting out which bits had to go where, and they just saw that as lazy, because they saw me cycling into work… Everybody knew, it's just that some people's perception is skewed because in a workshop environment it can be quite aggressive shall we say. But it can be also on the bordering of bullying I would presume it would be. (1011)

Work modifications

I'm fortunate in having the flexibility with regards to when and where I work. I suppose the best illustration of support at the moment is that I won't drive for more than say three hours in a day. And I've been told, that was my decision and I've been told as a consequence of that if I need stay over at somewhere, get a hotel, then that is fine…. (2002)

I'm walking around a fair bit and I'm doing a four-hour shift. I went back Monday four hours and I shall be doing 12 hours this week, just for a couple of weeks, and then I should go back to doing my full 15. I'm just phasing back gradually. (2013)

Tuesday 4th January was the day I returned and what my manager had said was I think you should do restricted days, I think you should do two hours the first day, four hours the second day, six hours the third day, eight hours the fourth day. Anyway, after the second day, I was back. I said no that's not the answer, the answer is I need to do just a morning for the first week and maybe a little bit more on the second week, and that's what I did…. I know how I feel. I know what I can do and what I can't do.(2206)

I think they could have, yeah they could have said come back and see, why don't you come back maybes and do a couple of hours and see how you feel. But they didn't mention that to me, nothing… I thought, you know, but then I'm 56, and I think of my age, you know, what other professions, what could I do, will other people, you know, will I get another job at my age…. (2210)

Yeah I would have liked to have gone back part-time, it wasn't offered.....if I hadn't had the same job I would have been back at work, but not the job that I had been doing. You're carrying motors around, you're crawling under machines, you're then climbing up through, up ladders, up into the roof space and things like that... (2303)

Occupational Health

I have to go to occupational health first for them to say yes I'm OK to return. And without a fit to return work note they won't, they'll say no, go and get one. … And obviously [employers name] are scared of litigation, simple as that. That's why they won't let me go back until I'm fit for work, until the doctor says you're fit. Litigation, because if I fall, have an accident, all I've got to do is say well they made me come back and that's it, I can sue them, job done (1011)

The only time I've seen occupational health was when I was due to go back, which was about three months. That's the only time I've seen, they've sent me to like your work's doctors, occupational health… (1231)

I had two months off, but when I did go back to work I had an occupational health review from work and wellbeing report. So two members of staff came out to see me at home……they came out and did a full report. And then when I did go back to work I went back on a phased return. But there was certain things that they wouldn't let me do. I couldn't lift any coins, they made sure I was up and down off my seat walking around every 20 minutes or so. (2318)

Well there was occupational health involvement, and we have a, I had to have a risk assessment done. And they just, and in between occupational health, risk assessment officer and my manager, it was put in place for what I could and couldn't do when I came back to work. (1229)

I went there [occupational health] and she asked, previously I had to write down everything. How many stairs and so on, and how I feel going back to work, if I feel comfortable and so. And I wrote everything down, and then when I was there with this nurse she asked me the same questions, and I said the same what I wrote down. And then she said do you feel then, do you think you are ready to go to work? I said yeah what do you want really from me? I couldn't get this. To be honest the whole thing was 10 minutes, and she, I think it was just a waste of time but it's only what I think. (1106)

<u>THEME: Perceptions of an occupational advice intervention</u>

Perceived need

Yeah possibly, I wouldn't say in my case that that was something that I was really crying out or really needed. I could see possibly cases where it would be useful (1005).

I would say no, nothing like that would have helped me. But I do feel that's only because I've got a good insight (1011).

I never even thought about phoning them up for any information or support on getting back to work because I felt I was well supported by my own management. But if I'd felt that they'd been obstructive anyway or I was having problems I would have probably phoned the advice line. But I didn't need to (1107).

Well yes and no. I mean I suppose it's different for everybody. I mean I've got people at work I can raise issues with if I have concerns about things. So that for me wouldn't be a problem. But it might be for somebody else (1307).

Format

I haven't even got a computer, the wife has one, but…No, I'm one of these cave men when it comes to computers (2103).

…it maybe sounds a bit unusual for somebody who works in IT and is always looking at a screen. But yeah, I think I must admit I prefer the book and actually having something that you can handle sort of thing (1005).

I think if you've got it at hand you can carry it around with you, and you can get it out any time you need to (2318).

And perhaps the opportunity to talk to other people in similar circumstances, because we don't tend to talk about these things, do we? (2002)

I suppose if you hand them a leaflet and say look that's what it's going to involve, and that's what I'm going to need off etc. So they know what's going on yeah, it would be a good idea for that. (2105).

Content

I think just some more realistic timescales (2002).

Well that it's beneficial to have an employee back for a limited amount of time on limited duties, rather than having somebody back straightaway who might regrettably have to go off again (1001)

I suppose everybody's different but that would have been nice to have said, probably in a little leaflet or something, there is a chance you could be back at eight weeks but don't worry if you're not, you know. It could take you longer and you've just go to sort of try and build that level of energy back up and your strength levels before you feel you should go back to work (1102).

…like an idiot's guide to what's going to happen because, like I say, it didn't cross my mind about work (1228)

I mean just advice. I needed reassurance, am I doing the right thing? You know should I be standing in the tea bar from eight until four. Is that OK? If this hurts should I do… I just needed reassurance. (1205).

Delivery

When you go to your GP or your surgeon shall we say, you maybe should get a booklet or a leaflet or something just to give you that bit more help and confidence (1204)

…a mentor or a physio person will be able to see you walk, can simulate what you do in your job, and then say yeah (1011)

Yeah it probably would have been quite useful, probably at the time that you actually put down that you do need a hip replacement and then you've got all the information there what you need instead of just like the information on the actual hip itself and the procedure (1216).

Obviously after the operation, and when I've, after a few weeks I've been obviously home after the operation. So once you've had a bit of a chance to recover a bit. To recover yeah, because obviously after the operation you don't see anyone after that do you really? (1231)

Appendix 5: Supporting information for the stakeholder interviews (IM Stage 1)

Section 1: Stakeholder interview schedules

Table 61: Workplace representative interview schedule

Topic area	Question	Prompts
Demographics	Can you tell me about your organisation?	Size – small/medium/large or number of employees. Sector - private, public, third Type of work – manufacturing, service, Manual / non-manual work Environment - office / shopfloor / environment (in/outdoor), site work Special needs / statutory requirements of the jobs [e.g. HGV drivers / divers / pilots / food handlers / safety critical work/specialist equipment] Range of jobs RTW policies and procedures – availability workplace adjustments, graded returns OH provision – none/ad hoc, contracted out, on-site
Individual role	What is your position in the organisation? What role do you have in return to work/ people-management responsibilities?	Duties, responsibilities, time in post Feelings/views about this role? Potential changes to/development of role
Relevant experience/knowledge	What experience do you have of supporting people at work who have had knee or hip replacement? Details of any relevant training?	Duties, hours of individual employee/s How involved in providing support Who else involved –e.g. GP, AHPs, OH, managers, HR, Fit for Work Services When and how were they involved – how effective were they? What happened, and when?
Perceived obstacles/facilitators Needs of employer	What things make/could make it difficult for employees who have had knee or hip replacement to return to work? What things make/could make it easier for employees who have had knee or hip replacement to return to work? What would help employers support people return to work following knee or hip	<u>Information-related</u> Extent of of sufficient/consistent/useful information/advice for patients and employers on RTW following surgery. What needed? How information/advice should be delivered/accessed? When? By whom? <u>Patient-related</u> Motivation/attitude/beliefs/expectations re RTW including self-efficacy, anxiety. Sick leave history/absence Extent of functional ability prior to surgery Life context – age, home circumstances,

	replacement?	travel to work. Family roles and responsibilities. Work-life balance. Financial circumstances. Transferable skills Co-morbidities Adherence/compliance with advice/support/RTW plan Symptom management <u>Workplace-related</u> Relationships Workplace/managerial support Workplace conditions – environment, pace, tasks, job demands, shifts/hours, travel, equipment use, availability of adjustments/redeployment, culture, sick pay/absence policies. <u>Employer-related</u> Extent of time/resources/skills to support employeein RTW Experience/training Prior experiences (positive/negative) <u>RTW management</u> Communication/transfer of information between key players. How conducted, by who, when? Extent of an agreed RTW plan Co-ordination of RTW Key players' skill in RTW management <u>Societal</u> Economic factors/conditions – local, national <u>Surgery related</u> Waiting times/delays to surgery Complications/consequences Restrictions/precautions Extent of focus on activity pre and post op Information about procedure/resumption of activity Certainty of timescales Extent of consistent/tailored advice and support re RTW provided by clinicians Follow-up/post op rehab
Occupational intervention	What would an occupational intervention for employees look like?	Who would deliver? Individual/team/profession/expertise When, how? Where? E.g. Ward – outpatient clinic, community Format – paper, on-line, phone apps, one-to-one sessions Components – assessment, advice, information, liaison, signposting, workplace visits
Outcome measurement	We are developing an intervention to help people	e.g. Days to return to work

	return to work after surgery. How do you think we might measure the effectiveness of the intervention?	Subsequent sickness absence Duration of modified duties/hours Employer's perception of work performance/productivity Employee's perception of work performance/productivity Time/resources required in supporting employee, e.g. OH referral, equipment needs
Is there anything else that you would like to say that we haven't already discussed?		

Table 62: Surgeon interview schedule

Topic area	Question	Prompts
Demographics	Can you tell me about your department?	Number of surgeons Population served Specialism (general/specific)
Individual role	What is your position in the department? What role do you have in patients' return to work (RTW)/return to usual activity (RUA)?	Duties, responsibilities, time in post. OH training, FT/PT Consultant, registrar?? individual specialism Whose role do you think RTW support is? Experiences/views about this role? Perceived future changes to/development of role
Relevant experience	What experience do you have of supporting people RTW/RUA who have had knee or hip replacement? Any training?	How have they been involved, actions taken? When? pre-op post-op clinic? Who else involved –e.g. GP, AHPs, OH, managers, HR, Fit for Work Services, family When and how are they involved – how effective are they? What happens and when?
Perceived obstacles/facilitators	What things make/could make it difficult for patients who have had knee or hip replacement to RTW/RUA? What things make/could make it easier for patients who have had knee or hip replacement to RTW/RTUA? What would help you as a surgeon to support your patients to RTW/RUA?	<u>Information-related</u> Extent of of sufficient/consistent/useful information/advice for patients/GPs on RTW/RUA following surgery. What needed? How information/advice should be delivered/accessed? When? By whom? <u>Patient-related</u> Motivation/attitude/beliefs/expectations re RTW/RUA including self-efficacy, anxiety. Sick leave history/absence Extent of functional ability prior to surgery Life context – age, home circumstances, travel to work. Family roles and responsibilities. Work-life balance. Financial circumstances. Transferable skills Co-morbidities (physical/psychological) Adherence/compliance with advice/support Symptom management <u>Workplace-related</u> Relationships Workplace/managerial support Workplace conditions – environment, pace, tasks, job demands, shifts/hours, travel, availability of adjustments/redeployment, culture, sick pay/absence policies. Equipment <u>Activity outside workplace</u> Physical and mental demands of UA (including PADL, DADL, hobbies, interests, family roles and responsibilities, social activities)

		<u>Surgeon-related</u> Extent of time/resources/skills to support patient in RTW/RTUA Experience/training Prior experiences (positive/negative) <u>RTW management</u> Communication/transfer of information between key players. How conducted, by who, when? Extent of an agreed RTW plan Co-ordination of RTW Key players' skill in RTW management <u>Societal</u> Economic factors/conditions – local, national <u>Surgery related</u> Waiting times/delays to surgery Surgical approach/type of operation/components used Experience/ability of surgeon Complications/consequences Restrictions/precautions Extent of focus on activity pre and post op Information about procedure/resumption of activity Certainty of timescales Extent of consistent/tailored advice and support re RTW/RUA provided by clinicians/AHPs Follow-up/post op rehab
Occupational intervention	What would an occupational intervention for these patients look like?	Who would deliver? Individual/team/profession/expertise When, how? Where? Ward – outpatient clinic, community Format – paper, on-line, phone apps, one-to-one sessions Components – assessment, advice, information, liaison, signposting, workplace visits
Outcome measurement	We are developing an intervention to help people RTW/RUA after surgery. How do you think we might best measure the effectiveness of the intervention from your perspective?	Patient's functional performance Sustained RTW/RUA Specific outcome measures Well being
Is there anything else that you would like to say that we haven't already discussed?		

Table 63: GP interview schedule

Topic area	Question	Prompts
Demographics	Can you tell me about your GP practice?	Indices of deprivation Size - Population served
Individual role	What is your position in the practice? What role do you have in patients' RTW/RUA?	Duties, responsibilities, time in post Partner, salaried, OH training, FT/PT Experiences/views about this role? Perceived future changes to/development of role
Relevant experience	What experience do you have of supporting people RTW/RUA who have had knee or hip replacement?	How involved, actions taken. Use of fit notes, referral /signposting? Who else involved –e.g. AHPs, surgeon,OH, managers, HR, Fit for Work Services, family When and how were they involved – how effective were they? What happened and when?
Perceived obstacles/facilitators Needs of GP	What things make/could make it difficult for people who have had knee or hip replacement to RTW/RUA? What things make/could make it easier for people who have had knee or hip replacement to RTW/RTUA? What would help you as a GP to support your patients to RTW/RUA?	<u>Information-related</u> Extent of sufficient/consistent/useful information/advice for patients/GPs on RTW/RUA following surgery. What needed? How information/advice should be delivered/accessed? When? By whom? <u>Patient-related</u> Motivation/attitude/beliefs/expectations re RTW/RUA including self-efficacy, anxiety. Sick leave history/absence Extent of functional ability prior to surgery Life context – age, home circumstances, travel to work. Family roles and responsibilities. Work-life balance. Financial circumstances. Transferable skills Co-morbidities Adherence/compliance with advice/support Symptom management <u>Workplace-related</u> Relationships Workplace/managerial support Workplace conditions – environment, pace, tasks, job demands, shifts/hours, travel, availability of adjustments/redeployment, culture, sick pay/absence policies. <u>Activity outside workplace</u> Physical and mental demands of UA (including PADL, DADL, hobbies, interests, family roles and responsibilities, social activities) <u>GP-related</u> Extent of time/resources/skills to support patient in RTW/RTUA Experience/training

		Prior experiences (positive/negative) <u>RTW management</u> Communication/transfer of information between key players. How conducted, by who, when? Extent of an agreed RTW plan Co-ordination of RTW Key players' skill in RTW management <u>Societal</u> Economic factors/conditions – local, national <u>Surgery related</u> Waiting times/delays to surgery Complications/consequences Restrictions/precautions Extent of focus on activity pre and post op Information about procedure/resumption of activity Certainty of timescales Extent of consistent/tailored advice and support re RTW/RUA provided by clinicians Follow-up/post op rehab
Occupational intervention	What would an occupational intervention for these patients look like?	Who would deliver? Individual/team/profession/expertise When, how? Where? Ward – outpatient clinic, community Format – paper, on-line, phone apps, one-to-one sessions Components – assessment, advice, information, liaison, signposting, workplace visits
Outcome measurement	We are developing an intervention to help people RTW/RUA after surgery. How do you think we might best measure the effectiveness of the intervention from your perspective?	Amount and duration of sickness certification (not fit/may be fit) Frequency of GP consultations Resource implications of GP consultations – prescriptions, referral on, signposting. Communication with other key players
Is there anything else that you would like to say that we haven't already discussed?		

Table 64: AHP interview schedule

Topic area	Question	Prompts
Demographics	Can you tell me about your department/unit/service?	Number of therapists, qualified/support workers Population served/specialism
Individual role	What is your position in the service? What role do you have in patients' RTW/RUA?	Duties, responsibilities, time in post. OH training, FT/PT Feelings/views about this role? Perceived future changes to/development of role
Relevant experience	What experience do you have of supporting patients RTW/RUA who have had knee or hip replacement? Relevant training	How have they been involved, actions taken? Pre-op, peri-op, post-op? Who else involved –e.g. GP, AHPs, OH, managers, HR, Fit for Work Services, family When and how are they involved – how effective are they? What happens and when?
Perceived obstacles/facilitators	What things make/could make it difficult for patients who have had knee or hip replacement to RTW/RUA? What things make/could make it easier for patients who have had knee or hip replacement to RTW/RTUA? What would help you as an AHP to support your patients to RTW/RUA?	<u>Information-related</u> Extent of of sufficient/consistent/useful information/advice for patients/GPs/employers on RTW/RUA following surgery. What needed? How information/advice should be delivered/accessed? When? By whom? <u>Patient-related</u> Motivation/attitude/beliefs/expectations re RTW/RUA including self-efficacy, anxiety. Sick leave history/absence Extent of functional ability prior to surgery Life context – age, home circumstances, travel to work. Family roles and responsibilities. Work-life balance. Financial circumstances. Transferable skills Co-morbidities Adherence/compliance with advice/support Symptom management Low mood/wellbeing <u>Workplace-related</u> Relationships Workplace/managerial support Workplace conditions – environment, pace, tasks, job demands, shifts/hours, travel, availability of adjustments/redeployment, culture, sick pay/absence policies. Equipment <u>Activity outside workplace</u> Physical and mental demands of UA (including PADL, DADL, hobbies, interests, family roles and responsibilities, social activities) <u>AHP-related</u> Extent of time/resources/skills to support

		patient in RTW/RTUA Experience/training Prior experiences (positive/negative) Motivation to change practice/attitudes to AHP involvement in RTW issues Staffing structure and levels Organisational support/infrastructure <u>RTW management</u> Communication/transfer of information between key players. How conducted, by who, when? Extent of an agreed RTW plan Co-ordination of RTW Key players' skill in RTW management <u>Societal</u> Economic factors/conditions/context – local, national <u>Surgery related</u> Waiting times/delays to surgery Surgical approach/type of operation/components used Experience/ability of surgeon Complications/consequences Restrictions/precautions Extent of focus on activity pre and post op Information about procedure/resumption of activity Certainty of timescales Extent of consistent/tailored advice and support re RTW/RUA provided by clinicians/AHPs Follow-up/post op rehab
Occupational intervention	What would an occupational intervention for this patient group look like?	Who would deliver? Individual/team/profession/expertise When, how? Where? Ward – outpatient clinic, community Format – paper, on-line, phone apps, one-to-one sessions Components – assessment, advice, information, liaison, signposting, workplace visits
Outcome measurement	We are developing an intervention to help people RTW/RUA after surgery. How do you think we might best measure the effectiveness of the intervention from your perspective?	Patient's functional performance Sustained RTW/RUA Specific outcome measures Well being/QoL
Is there anything else that you would like to say that we haven't already discussed?		

Section 2: Characteristics of interviewees

Table 65: Characteristics of employer participants

Workforce Size∞	**Relationship to employee**	**Sector**
Small*	Colleague	Private healthcare provider
Small*	Managing Director	Manufacturing
Small	Manager	Hospitality
Medium	Manager	Manufacturing
Medium	Human Resources	Service sector
Medium	Occupational Health advisor	Manufacturing
Medium	Managing Director	Service sector
Large	Manager	Central government
Large	Manager	Primary Education
Large	Occupational Health Physiotherapist	Manufacturing
Large	Human Resources	Transportation
Large	Occupational Health nurse	Leisure/Hospitality
Large	Human Resources	Transportation
Large	Human Resources	Leisure/Hospitality
Large	Manager	Leisure/Hospitality
Large	Manager	NHS Trust
Large	Staff liaison manager	NHS Trust
Large	Human Resources Manager	NHS Trust
Large	Human Resources	Further Education
Large	Manager	Local government
Large ±	Occupational Health nurse	Local government
Large ±	Employee relations	Higher Education
Large ±	Manager	Higher Education
Large ±	Human Resources	Retail
Various	Occupational Health physician	various

∞ Workplace Size (small* = <10 employees, small = 10-49 employees, medium = 50-249 employees, large = >249 employees, large ± = >5000 employees)

Table 66. Characteristics of surgeon participants (*36 month practice profile 01/04/12 to 31/03/17 (NJR))

SITE	METHOD	THR*	TKR*	YEARS IN POST
A	Face-to-face	165	230	11 - 15
A	Face-to-face	404	578	6 - 10
A	Face-to-face	207	179	21 - 30
A	Face-to-face	74	73	0 - 5
B	Face-to-face	376	337	11 - 15
B	Face-to-face	337	334	6 - 10
B	Face-to-face	102	145	0 - 5
B	Phone	331	355	21 - 30
C	Face-to-face	264	102	11 - 15
C	Face-to-face	341	511	16 - 20
C	Face-to-face	189	328	11 - 15
C	Face-to-face	733	423	11 - 15

Table 67. Characteristics of GP participants (*Indices of Multiple Deprivation (1- 10 where 1 = most deprived))

Method	Clinical Research Network	Years in general practice	Practice population	IMD*
Phone	B	11 - 15	14,879	6
Face-to-face	B	16 - 20	14,244	9
Face-to-face	B	0 - 5	8,838	4
Phone	B	0 - 5	14,197	3
Phone	B	6 - 10	14,197	3
Phone	C	16 - 20	10,421	6
Face-to-face	C	21 - 30	8,895	7
Face-to-face	C	21 - 30	8,895	7
Face-to-face	C	21 - 30	8,895	7
Face-to-face	C	0 - 5	8,895	7
Phone	C	6 - 10	5,556	6
Phone	C	0 - 5	13,334	5
Phone	A	16 - 20	13,739	5
Phone	A	21 - 30	15,477	6
Phone	A	21 - 30	4,262	8
Phone	A	31 - 35	7,887	3

Table 68. Characteristics of AHP/Nurse participants (*sites referred to by letter to maintain anonymity)

Profession	**Band**	**Years in post**	**Hospital Site***
Physiotherapist	7	6 - 10	A
Physiotherapist	7	16 - 25	A
Occupational Therapist	6	0 - 5	A
Occupational Therapist	5	0 - 5	A
Nurse practitioner	7	11 - 15	A
Occupational Therapist	7	0 - 5	B
Occupational Therapist	6	6 - 10	B
Physiotherapist	7	11 - 15	B
Physiotherapist	7	16 - 25	B
Nurse practitioner	7	0 - 5	C
Nurse practitioner	6	0 - 5	C
Occupational Therapist	7	0 - 5	C

Section 3: Interview quotations

A. Workplace representative interviews

As described in Chapter 6, interviews with workplace representatives produced the following three themes:

- Experiences of accommodating patients undergoing THR and TKR in the workplace
- Barriers and facilitators to RTW
- Perceptions regarding an occupational advice intervention

Direct quotations to supplement the narrative description in chapter 6 are presented below:

THEME: Experiences of accommodating patients undergoing THR and TKR in the workplace

But my other lady, bless her, worked right up until she had it because she needed to work. So I made sure that she had a lot of support in place. A lot of our accommodation can be quite far out. I made sure she was close to base. And she found it a lot easier if she rode a bike instead of walking. So I made sure that she had her own bike to get to and from the accommodation. She struggled with making the beds side, so we had her beds made for her, just that extra support until she did go off and have it done. (15, Manager)

[prior to surgery] The teacher wouldn't let on that she was in pain, but you could see that she was getting tired and her hip was, you could see the way she walked was different….but you could see that she was in pain and at the end of a day that that fatigue crept in. (19, Manager/Headteacher)

So what we had to do with him was look for alternative work. And we actually managed to get him alternative work within the engineering department that didn't require him to do kneeling down. (3, Head of HR)

I mean he'd been having problems with his knee for 18 months or so and then got advised from his doctor that he really needs to have the knee replaced and he shouldn't be at work until such time as it's done. So he's been off basically sick awaiting the operation. Which he still hasn't had and doesn't expect to have until January…I would have thought he'd have been capable of doing, even if he was having this knee problem, but the advice from the doctor was no you should not be at work at all. (11, Managing Director)

THEME: Barriers and facilitators to RTW

Occupational Health (OH)

I think we're probably in a better position than perhaps some smaller organisations or private organisations, and we've got access to an occupational health service which we purchase from a local hospital (20, Staff Liaison Manager)

With anybody that's coming back from any type of invasive surgery we would refer that person to occupational health just to make sure that we are doing everything with regards to the guidelines. (21, Head of HR)

Our occupational health provider was so good at asking all the right questions and keeping us as informed as possible (25, Head of HR)

We sort of made it up as we went along. The person said oh I might be OK, my chair might be OK, I might not need anything. It was only when she came back and tried it and so there was a few days when she wasn't comfortable and then there's always a delay on OK so let's get occupational health in now……I don't think she (the employee) received anything automatically from our occupational health team. It wasn't until we pulled them in. So there's no policy to support a manager proactively prior to an operation, which would be helpful. (12, Commissioning Manager)

We try to get them into the clinics before they come back as a whole anyway. I think it's only the odd one that sometimes the clinics are just so full that that person is ready to come back; it's just that we can't get them in. (13, OH Nurse)

GPs

I know they only have ten minutes at a time to have with each person, which is very limited, as to what the person's job role is. Unless they volunteer the information, they just say well OK well when you go back to work I suggest work modifies your role and then they just tick the box. So I don't think they've got to time to write things out a lot of the time. (17, OH Adviser)

Generally they're (fit notes) not very good. I've got to be honest. They don't put much information on there. They're very vague. Just very ……vague things, and just no, nothing that we can use. So that's why we end up having to write to them asking them for more information. (6, OH Adviser)

…sometimes you get the impression that the doctors, I don't know if rightly so, can be influenced by the individual…. I don't know if the GP's up to spec with it (recovery from surgery). And again I get the feeling that GPs can be influenced by how much the individual, what the individual says or expects. (18, Manager)

Other things that you asked are around a graded return, obviously known either by a phased return or more specifically in our department we call it part-time medical grounds. We can arrange that. We don't need a GP's consent or permission or approval for that. If we feel as management that it's appropriate we can agree that directly with the individual (16, Manager)

The employee

They're 'oh I'm really frustrated being at home, and I can't go out and I really want to come back to work.' So I think it's when they get to that stage it's the right, well just because you're feeling frustrated doesn't mean that you're fit enough to come back to work for example. (4, HR Employment Relations Manager)

And sometimes we have staff members who say they feel fit to come back to work. And that might be because they actually do, or it might be because financially they're worse off by not being at work. (11, Managing Director)

…sometimes it's quite daunting if somebody's away for that length of them, you know, for them to feel a bit apprehensive about coming back into work. That individual, it took me six months to get them back to work and it was all to do with the fear side and the anxiety of it. (21, Head of HR)

I suppose it's down to how well they follow the instruction for their exercises and such to rehabilitate. (22, General Manager)

Because they've only either got a few months left or a couple of years left, and they just think do you know what, it's not worth coming back and heaven forbid but doing any more damage. (3, HR Director)

The Workplace

So you have to adapt according to the number of staff that you have as well as to who can cover and who can help….it doesn't always work that way if it's a small company. That's the difficulty as to how you can accommodate it accordingly and if other people are there to fill the shoes as well. (5, Colleague)

There wasn't really the facility for her to come back on light duties or anything like that really because any administrative, we have admin staff for doing admin so, you know, and bookings where we get information off newly pregnant ladies and give them information, that would have involved a lot of sitting down which I don't think would have been suitable for her. So you've got to hit that balance between activity and rest and I'm not sure we would have been able to provide activity and rest. It would have been a bit of a challenge for her I think. (23, Ward Manager)

When they come back to work, we then continue the physiotherapy in-house. When we see them in-house then we carry out and do an assessment. We then provide them with an individualised strengthening programme and then we've got a rehabilitation gym. And then they complete their exercises down in our gym two to three times a day. (2, Occupational Health Physiotherapist)

Now obviously you can appreciate his return to work is very much more straightforward than somebody who's out on the engineering shop floor. (3, HR Director)

it was difficult because we weren't too sure how long he was going to be off for. He worked in a very specialised role so it was about training someone new to do that role and not knowing how long they were going to be able to be in that role for. It did make things really difficult. (25, Head of HR)

Surgery

Her hip was fine, but she had a burn caused by whatever they use to cauterise the wound, caught the inside of her leg, which caused her quite a deep burn on the inside of her leg. So that was causing her more issue because that wasn't healing very well. And that caused more issue than the actual hip in this case….. that was the cause of her staying off longer (19, Manager/Headteacher)

this particular case there was an added complication about soon after the operation she had DVT which extended that length of time that she couldn't come back to work as well. (12, Commissioning Manager)

And I suppose the difference then in NHS is that you may then have some people that are off for six weeks, some people are off for eight weeks, maybe ten weeks and it could potentially then cause problems. (2, Occupational Health Physiotherapist)

So anyway the operation was postponed several times over a period of about two years actually and of course the knee just deteriorated until he was struggling to walk…. Well I think the postponement of the operations caused the problem to be exacerbated to the point where it was, it became a bigger and bigger operation if you like to do the work (9, Managing Director)

I think what delays them coming back to work is the length of time they have to wait for physiotherapy or stuff like that after their operation…..Because I know that they want them to get up and get going, but then they have to wait a period of time before they're having the physio or they're checked…. (14, HR Manager)

THEME: Perceptions regarding an occupational advice intervention

Perceived need

I think I would be very pleased to see it. Yeah to give us some kind of an idea, because an operation like that, I've got no idea how the recovery works and whether actually being physical and doing some work makes it better. I really don't know. But I would be very interested to see something like that. (11, Managing Director)

And therefore having guidance that lays out probably a best approach to return to work would be some phased return based around the advice from healthcare professionals and the symptoms of the individual will lead to the person getting back to work and being an asset to the company or whatever.....So I think from the employer having that sort of guidance. And I suppose at the moment, because that isn't really in place it's probably reliant on the individual having the surgery telling the employer well this is what's going to happen (7, Manager/Head of Department)

Timing

I mean getting the information as soon as we could would be helpful for us and presumably, I mean in XXXX's case he had to finish work before he'd got a date for an operation or anything because it was so severe. What I would have thought with most people, they're perhaps suffering and they would remain at work but perhaps have to be on restricted duties and you would then at least have a chance to say, you know, to timetable when the procedure's going to be and what their recovery is going to be like. (11, Managing Director)

I think it needs to be part of the consultation package to the employee, to the person who's having the operation. So when the consultant's talking about their operation and their recovery time and everything and you know, what work do you do and is that work feasible for you to go back to, I think it's important that the consultant at that time finds out as much as possible and then probably gives it to them then. So that it's sowing that seed right from the beginning that you will be able to return to work. (14, HR Manager)

Because obviously if it's, when you've gone for your appointment with the surgeon, being told about your operation, maybe that's the point at which you should start thinking about it. (6, OH Adviser)

…but to me until the person has had their procedure and are therefore knowing whether there's been any complications or whether the surgery went fine, that to me is when I personally would prefer it. Knowing that they're going to be going off for a window of six to 12 weeks for example, that's going to be the same. But obviously if then they've had complications and therefore it's likely to extend past, or actually it's been dead straightforward and it's been easier than expected, that's when personally I would feel that I would get the benefit out of it. (16, Manager)

Format

when the employee has their surgery that as part of their pack maybe a leaflet with regards to advice for employers and the details of the website and the direction of where to go… (21, Head of HR)

I think a leaflet kind of style rather than anything big and imposing. Again I can only really speak from this one person's experience, but I know she doesn't particularly like to read very much. So I guess things that have got illustrations in as much as useful words and things like that. (10, Head of HR)

…if it was access online that would be great because every employer has got access for that. Because if it's in a pamphlet or something, you know, I'm not being derogatory against people but you get a

leaflet and it goes on the side and then it falls behind a cupboard and it's gone; whereas I think everything that we look at now, as businesses, the first place that you do go for guidance is online. (21, Head of HR)

And the other thing is, you see, we tend to - you're not sitting in front of computer when you meet with them, so it would be nice to have something in your hand, you know, when you're actually meeting with them that you can discuss. (24, Senior HR Adviser)

I mean I don't know if there are advice lines or anything like that that people can contact if they've come back to work and they're finding it a bit more difficult than they were anticipating to do so. (10, Head of HR)

Delivery

from the specialist or the doctor, so it's specific to that person….I think probably his own GP, you know, because I mean there's some, in the surgery I go to there's some great nurses, nursing staff…..and it could have been followed up, not going to hospital but attending as a patient at his own GP's surgery. And that way you could probably go on a more frequent basis than going into hospital. (9, Managing Director)

Well I mean I think from a functional perspective probably someone that's at least got knowledge and skills related to that sort of post, well through rehabilitation I think…..It does seem to me that folk like physios and occupational therapists would be well situated to take on that type of role – whether they'd want to or not…(7, Manager/Head of Department)

if the site's got an occupational health department, we would - either a 10 minute chat with the occupational health department and their line manager would probably be very good, to say we like to speak to the line managers directly and the occ health department and have, and either give them this leaflet with guidelines and then they get to ask us any questions about the actual individual. (18, Manager)

I think it would be nice if you could have reports from people... But if the surgeon was to say well look, you know, you've chatted about what your job entails, then I would suggest that your work makes some modifications to, you shouldn't really be doing this, this and this. And it actually has come our way in writing. I never get, we never hardly ever get anything, you know, it's like scan results and X-ray results and physio updates. I mean they go off and have their physio and then they come back here and they say oh, oh, I say, how are you getting on with the physio? Oh I had my last one last week. Oh right, well how did it go? Oh not too bad. He said I don't need to go anymore. Right, fine. (17, OH Adviser)

Content

So the booklet should turn round and say that if you have an occupational health centre, the best person to help you on any workplace adjustment is your occupational health centre, so please get in touch with them, because they're the ones that have been out on the shop floor. (2, Occupational Health Physiotherapist)

I don't know whether this is a barrier, but the fact that maybe if people have been off for six months, they may feel out of the loop so to speak, out of the loop of work… I think quite a lot of people seem, because the letter that we send out is quite a formal letter, and the meeting is called a formal attendance review meeting, so I think quite a lot of people get anxious and they've said that when they've turned up that they felt worried about it, because they weren't sure what it was about. So I don't know whether maybe as part of this manual thing maybe to give them an overview of what

these meetings are, and the fact that they are a supportive method of helping to get, to find out what's wrong with them and to help them and support them back to work….another thing to include in return to work is the rights of people coming back to work, that sort of thing. (10, Head of HR)

Whether you've had one replacement or two replacements, and whether they're done together or separately, and all of that sort of thing as well. (10, Head of HR)

I suppose if it's informative to all members of staff what to expect when they come back……..be informative as to what they've been through and what to expect on their return … So that everybody can understand and well look, you can't be expected to run up and down the stairs 10 times in the course of a day like you'd normally do. (5, Colleague)

And if the manual is also for HR, so if it's about recommendations in terms of organisations, processes and procedures – one of my very key concerns is the sickness absence and how it's recorded and how that could impact on the future career of that person….So I would guess a recommendation would be about identifying these situations where an employee may have to be in hospital and recovering and how is that recorded on your sickness processes and is it exempt from other types of sickness…… So there'd be a bit of clarity for everybody about what the return to work would look like, who's going to get involved and when. (12, Commissioning Manager)

Measuring impact

That the person's back in work, working at a level that is appropriate to where they should be and in comparison to the preoperative, how they worked pre-operation really. And so you're comparing that, in truth within a short period of time they should be working at an even better level than pre-operation, because obviously the operation is there to fix them. (19, Manager/Headteacher)

has the employee made a successful return to work (9, Managing Director)

I suppose the success of somebody remaining in employment and feeling that they've been supported, so personal evaluation from the employee's perspective and from the manager's perspective, (20, Staff Liaison Manager)

….. if there was further absences in the future related to that surgery… (8, HR Director)

So if someone wasn't coming back to work after eight to ten weeks, then what's gone wrong? Is it infection? (2, Occupational Health Physiotherapist)

I mean to understand whether people read it and stuff it might be hits on the websites increases. Are people reading it and are people, your leaflet, are people picking up reading it and going to search for more information…are people taking it, is it hitting the right spot in terms of people going to look. (18, Manager)

B. Healthcare team interviews (Surgeons, GPs, AHPs and Nurses)

As described in Chapter 6, interviews with the healthcare team produced the following four themes:

- Decision to have surgery and expectations of recovery
- Advising patients about work and other activities
- Barriers and facilitators to return to work
- Perceptions regarding an occupational advice intervention

Direct quotations to supplement the narrative description in chapter 6 are presented below:

THEME: The decision to have surgery and expectations of recovery

So you need to give people realistic expectations, and you've no idea pre-operatively in terms of setting more realistic goals. You've no idea who's going to be swellers and who aren't, and who's going to cope well with the pain and who isn't, do you know what I mean? (AHP/N 3004-7a)

But I guess there is the general idea of leave it as long as you can. That's still very much what patients understand is being told to them all the time. And I don't know whether that's coming from the consultant necessarily or whether that's, yeah (GP 5013)

If people fully understood what was involved, what the likelihood was that they could get back to work and how many months out, that really should probably be part of your decision making process as to whether you're going to have the surgery or not. (AHP/N 3001)

I rarely see people that feel they've recovered within the timeframe they say they've been advised, normally quite a lot longer. …..in general I think it would take a lot longer to recover than they anticipate before they go in. (GP 5004)

The work aspects which drive people to surgery, I mean some would say - I can't have surgery because I just can't get the time off work. I can't afford it – particularly if they're self-employed. Some will say I can't afford any more sick time, I need surgery. Or I'm self-employed, I'm getting to the point where I can't work, and that's why I need surgery… (S 4006)

THEME: Advising patients about work and other activities

Perception of roles

I think that the conversation is probably done by the consultant when they get listed for surgery and when obviously they go through all the surgery and all the recovery process……But during the inpatient stay, I don't really recall that every single patient does have a concern or do ask us can I go back to work, when can I go back to work. But I don't know if it's something that they have already talked about before or if it's something that they're just assuming that I'll have to wait until I come for my follow-up and then I can go back to work. So this is my thought, I don't have a, I'm not hundred percent sure. (AHP/N 3009)

They don't tend to ask us, but then I think that's because we're not asking them anything about work. (AHP/N 3004-7d)

As a GP you kind of feel a bit uncomfortable sometimes interfering too much with the rehab process ……..in terms of encouraging people to get back to work, we're more interested in making sure people feel well and that they're getting better. And work is kind of secondary to that really. (GP 5002)

I think we are often trying to give people advice about employment and we don't necessarily know ourselves…..We're the people who end up keeping people off work because we're the ones who are a bit scared. Even though we're thinking surely with a bit more thought this could be OK. (GP 5013)

We give them an information booklet at listing, which will have some information. But I've not been through that very carefully so I don't know what it says about work to be honest. (S 4006)

Differing management of THR/TKR patients

The physio is the person mainly involved with seeing all the knee patients. So they're kind of her patients….we did used to see knees years and years ago. And it actually came from one of the surgeons who advised us not to see the knees.… And in terms of recovery evidence has shown that the knee recovers better when you've got the full bend etc. So - don't raise toilets, don't raise furniture, encourage the patient to bend their knee as much as possible really. It's apparently all round enhancing the recovery. So at that point we were asked not to see people…(AHP/N 3002-3)

Yeah, we don't do a lot with hips these days to be honest with you. We stopped doing the exercises a few years ago because it was found that they weren't of much benefit really…. mostly they'll go home and then they'll get seen at the joint replacement clinic again in two weeks and then they'll be seen by the consultant in a few weeks after that.(AHP/N 3012)

I think that's why it's good that all of the knees at least get referred to physio now. Because at least that does give an opportunity for the physios, if they're wired up and clued in and interested in knee replacements, to tailor their advice from two weeks post-op… definitely some of the patients that come back to clinic who have been and had physio out in the wilds say it's very minimal the advice and information they're given (AHP/N 3004-7)

…. So not everyone who has a replacement done here at [name of main hospital] or within our Trust boundaries has exactly that path because if the patient happens to live out in [another part of the region] then they might …… they maybe actually rehabbed in a smaller centre as opposed to a main university hospital that we are, and so they don't have the same facility for drop in clinics I think for that reason. (AHP/N 3001)

Because recovery from knee replacements is very different from recovery from a hip replacement. It's much more difficult, and you've got to educate the patients a bit on what to expect afterwards, and start them doing their exercises and start them doing some physio work beforehand to make it easier afterwards. So that's why we target the knees because we know they might struggle. (S 4006)

Advice currently provided

The key thing here really is this blanket bans and blanket timeframes are very difficult to establish. The trust has adopted a rule that if you have a sedentary job you can't return to work until six weeks post-op. If you have a heavy manual lifting carrying job…. you can't return until three months. (AHP/N 3004-7b)

…the doctors will sign them off on the sick, obviously having had a knee replacement, but whether it's six weeks, eight weeks, twelve weeks… (AHP/N 3001)

But we normally say because they all come back and see their consultant at six to eight weeks, that's when they're given the sort of go ahead to get back to driving and sort of after six weeks and then we say at that point obviously as long as your consultant's happy then it's sort of a case of as long as you feel OK to go back to work. (AHP/N 3010)

I follow the guidance really of the first post-op follow-up at the hospital. So I make sure that the consultant has reviewed them and hopefully there's a decent letter that says, you know, they can now do whatever they like or they should be careful and carry on walking with crutches or, you know, whatever. So I'm very reliant on the specialist to tell me how well his work is progressing. I wouldn't personally give an opinion without that. I mean it's their hard work and if I tell the patient to do something that then upsets the whole thing I don't think I'd be very popular. (GP 5003)

Yeah, that's the bit where we have to say look only you know your job. Most companies will have an occupational health person, so they can do it and they can do a return to work assessment. (S 4007)

Communication with other stakeholders

I can't think of a knee replacement where I've had much involvement or correspondence with an employer….. I think that's something I normally leave to the patient themselves to do. (AHP/N 3001)

I do occasionally in clinic get asked if I can provide a, if I can send a copy of the clinic letter to an occupational health professional. But that's only in the biggest best organised companies generally. (AHP/N 3004-7a)

A lot of the first follow-ups are with the physios who are just more interested in the mobility and progressing them in that way. So in the letters to date they don't really say anything about return to work in them normally. They're just normally this person's doing well. They can do this now. It's that sort of level of information really. (GP 5002)

Ours are pretty good. As I say, they're putting on the discharge form how long a note they've given. And presumably in doing that they've discussed with the patient because we rarely get somebody coming in there afterwards. The physiotherapists usually either pass on messages via the patient - and that's fine. (GP 5014)

… it could help the GP if they do refer to those discharge letters, or they just get piled somewhere! If they are looking at them and they are looking at them, if a patient is in asking about work, if they thought well I'll see what the discharge letter says. If there was some information there it could be useful. But then again the discharge letter is written by probably the most junior person, more often than not the most junior person in the team, because they tend to be done pretty much close to discharge by the junior staff on the ward. (S 4006)

Fit notes

The sick note is better these days because you can specify to alter duties, phased return and workplace adaptations, and all those things are very useful and some people do ask for them when they're returning to work, but they tend to be people who have decent sized companies where there's a good occupational health service available to them that they've utilised. (GP 5015)

And I wouldn't routinely see them unless something is flagged up for me to do that. And sometimes that's a sick note that hasn't been completed in the hospital, something as simple as that…And I think it is the hospital's responsibility but they don't always do it. (GP 5003)

Yes it tends to be more the junior staff I suppose upon discharge. Then occasionally if they come to clinic and they're needing a bit longer they'll ask for an extension, so it's on request really. (S 4001)

I don't write them. Well the nursing staff can sign a note covering their sick period whilst they're in hospital. Beyond that it would generally go to the GP, and then the GPs do it. So it tends to be post-operative, post discharge tend to be all GPs. (S 4006)

P2: Often have that conversation with them. I'll write you up for six weeks but you can go back when you want, when you feel free. And people sometimes ask for a note to go back to work. P1: I had to fill one in today actually because some employers require a safe to go back to work risk management thing which is a bit irritating but it is the way that they work. (4009-12)

Advice about driving

But we normally say because they all come back and see their consultant at six to eight weeks, that's when they're given the sort of go ahead to get back to driving and sort of after six weeks and then we say at that point obviously as long as your consultant's happy then it's sort of a case of as long as you feel OK to go back to work. (AHP/N 3010)

..they get advised around not driving for six weeks, which is a historical thing which still I know is kind of fairly universally….By historical I think what I mean is I've never seen a paper which says it's highly dangerous or illegal for anyone in less than six weeks to be driving a car. But it's something which I know is still reinforced by so many different stages that I think we still do as well (AHP/N 3001)

I usually ask them, are you confident in driving? And I have got no means of assessing whether they are confident or not. (GP 5001)

I think they do get advice on how to mobilise and when to start driving and when to start, you know, getting in and out of a car blah, blah, blah. But I assume they get that before they leave [the hospital] because we don't give them that advice (GP 5009-12)

So for most people- 'I can't go to work because I can't drive to work'. (S 4007)

(A): You can't assess somebody's fitness to drive in clinic. (B): There's no measure. (A): The only way you can really do that is to take someone out round a course in a car……(B): My rules on this, once they can put their full weight through the affected limb then they can probably balance and put power through it, so it's safe to drive. (S 4002-5)

<u>THEME: Barriers and facilitators to return to work</u>

Workplace

And they [employers] often think that it's just a hip or a knee operation. They don't class it as major surgery that will affect the whole body. And somebody I had I think a couple of weeks ago and said oh when I first told my employer I was going to have this operation they said oh well we can expect you back two weeks afterwards. (AHP/N 3008)

I mean the more common ones within the UK now of course is the absence of sick pay, for the vast majority of people work in industry. So there will be a desire financially to return sooner for a lot of the people. (AHP/N 3004-7a)

Some employers are quite good at finding work for people who have had a good track record in the company, others not so much. You ask them, can you do light duties, would that be helpful? No chance, I'm either there or I don't have a job! (GP 5015)

Public sector is much more forgiving and they want to get people back to work, and they're happy to tolerate a phased return. I suspect those people in the private sector would just be back at work and doing their full job at the start of someone else's phased return. So it just moves the pathway forwards a bit. (S 4002-5 B)

I think a lot of companies and employers feel so risk averse with regards to people trying to sue them. 'I went back on my crutches and I slipped and now this has happened'. And I think a lot of them are in that very risk-averse culture, which is complete nonsense because it's probably not going to happen. But I think a lot of them try and prevent people getting back to work early because of that. Oh you might fall and you'll sue us. I think that, there is a bit of a feeling that goes on around the place. (S 4006)

Job demands

Teachers might be able to go back a little bit earlier, because they often can sit behind a desk and not really get involved in anything too active. (AHP/N 3008)

We've obviously we do have patients that obviously do some office work and they can return to work earlier (AHP/N 3009)

But it does depend whether it's a physically demanding job or whether they've got a desk job, how they get to work, you know, do they drive normally or do they get a lift or do they have to catch public transport….. If it's a physically demanding job then that's going to take them a bit longer before they can get back (AHP/N 3012)

Yes well I think it does depend a bit what you're doing, you know the difference between relaxing at a desk sipping coffee and resting at a computer is easier than wrestling with sacks of potatoes. So if it's sedentary well it's going back soon but if it's hard manual you need to be able to cope with it. And so yeah… (S 4001)

Manual workers, to be honest with you if you had a builder, yeah come on, they're going to need to just take it easy. So anything that over-stresses it, puts too much stress on their joints you just want to let them settle really. Sat in an office chair is fine. Things like that. (S 4007)

Occupational Health

We're in a different ballgame there, and that's where individualised assessments come. Now obviously the big firms have their own occupational health service anyway. That's fine. It is going to be a minutiae of people who work in, either for themselves or in small firms. (AHP/N 3004-b7)

Because you quite often find that maybe they're not very clued up really as to what hip and knee replacements should do for each individual trust or consultant… I think in occupational health circles as well, that doesn't, they don't understand the full work as well… (AHP/N 3008)

…sometimes they'll have an appointment with their occupational health practitioner before they go back to work. But that tends to be how are you getting along, is everything all right? (GP 5015)

M3: There is that, is it fit to work scheme or something you can refer, I have to confess I've never referred anybody to it. But there's that you could refer if there was somebody who was having difficulty returning to work. M3: I don't know quite what would happen to them if you referred but there you are. F: Yes I don't know either. (GP 5009-12)

I know that in a lot of employers it's very difficult to get occupational health advice. And it's certainly difficult to get it on an ad hoc basis. I think too often you'll end up with a sort of well this is the situation you are now in, can you do your job? Rather than planning. (S 4008)

GP

But outside agencies such as GPs, nurses at surgeries, they don't understand the full whys and wherefores of joint replacement. (AHP/N 3008)

I think another factor is the availability of the internet, and the fact that people these days are a lot better, are quite well read, again particularly the younger patients. And so actually there are, people are prepared to work a bit harder to persuade the GPs to refer them, because they know that there's something that can be done. (AHP/N 3004-a7)

I still think there's probably that bit of a barrier too, and I think the GPs will stave them off as long as possible as well before they'll even get to see a consultant. (AHP/N 3004-a7)

So the GPs I think are vital in terms of identifying the patients and sending them to us. But they may well have to also speak to patients who are still in work and say you may well have to consider whether you will be able to continue your job, particularly the heavy manual type jobs, following surgery, and whether you would need to change career. But I appreciate that's difficult for GPs as well, because a lot of them don't have any occupational health training either. Some of them have an interest in occupational health but they're very few I think. (S 4008)

They might be under their GPs, and if the GP understands the GP will try other things and explain to them, or they might have been referred on, and I know people are referred on. And the consultant will say you are too young. And it's not from any wrong reason, it's just how long a prosthesis lasts for. So you have to factor that in. (3004-c7)

Patient

And also you'll find the self-employed cohort of patients are very much more keen to get back to work than the employed are. You'll find the self-employed people are back sitting at their desks a week or 10 days afterwards to some degree or another, and there's no way of persuading them that that's not a sensible thing to do. (AHP/N 3004-7a)

The thing that really affects the hip replacement – in the first six weeks – is the use of hip precautions. Which means their entry into the workplace is limited by their ability to travel to and from the workplace, and their ability to use the facilities within the workplace (AHP/N 3004-7b)

So the ones who, you tend to get people who err on the side of caution and they don't do enough. And then you get the others who want to conquer the world within weeks, and they can often do too much. And by going back to work then they risk having to go off sick again because their hip is being asked, or knee, their joint is being asked too much of it. And they end up being in pain more at night time and more stiffness, more swelling. And then they might end up being off sick again (AHP/N 3008).

Or some patients have quite and black and white idea: I was told I'd be off for however long and that's it. Their time's up and they have to go back to work. (GP 5013)

Well, we're rural, so we've got lots of very stoic farmer types and they're self-employed and they will not have time off work, so you know if you're going to refer them for any surgery they're going to be back at work within two or three weeks and that's what they'll do. And so that's not to say they'll necessarily be doing the full level, but they will be working. (GP 5013)

Surgery

The hospital actually are quite kind and thoughtful about fitting them in around their work schedule, so one is a music teacher I'm thinking of and they allowed him to delay it to do it in summer holidays so that he didn't need to have time off school. And another lady was a carer and had some family issues going on at the time and they allowed her to sort of be a bit flexible about the date that suited her caring duties. (GP 5003)

There's an ideal recovery time, but people are very variable and some people have complications. And some people deal with pain and physiotherapy much better than others. (GP 5015)

They're going to be at significant risk of getting a lot of swelling if they're going to be on their feet all day long. (S 4006)

Yes well I suppose it's a whole separate channel of complications related to surgery. So obviously if you have the misfortune of a recurrently dislocating hip or infection requiring wash out, you know, anything that brings you back into hospital is obviously going to be a huge roadblock. And then things like stiff knees requiring a manipulation under anaesthetic. That would be a challenge for a chap who has to do stairs in his day-to-day work. But those are small, you know, a small subgroup of complications would obviously be a delay, but otherwise no. (S 4001)

So if a lot of patients had their choice they would pick their times, and they would pick quiet times. So some teachers would pick a time post exams so they get rid of that busy time. People in the building trade will pick Christmas because the building trade closes down pretty much all over Christmas. If you work in the pub trade you'll pick January because it's your quietest time of the year… But then it becomes very difficult because of the logistics of the way the NHS works, and the issues of breaching times and this sort of thing. … (S 4006)

Resources

I think we're quite fortunate here at this trust, and I'm sure it probably won't be indefinite but as I speak there's not huge pressures on you to review ratios, we are able to keep people on the books for quite a long period of time…. I do think that a really high quality outpatient sort of postoperative rehab plan to get someone back to a higher level is actually quite labour intensive….. we haven't got a pressure to discharge people quickly so we're able to hang on to people for longer (AHP/N 3001)

So it's that balance again between the resources, we're offering that service to everybody as opposed to the very tiny proportion of people who might actually get back to work quicker. And that still isn't going to benefit the NHS, but the resources would come out of the NHS to get them there (AHP/N 3004-7a)

I've seen quite a few cases in which I've been quite disappointed with the lack of physiotherapy, because patients are now being discharged early from the hospital because they need the beds. (GP 5001)

M3: Well, currently, with the CCG to restrict people going forward, they have to go through six months of conservative treatment before we're allowed to refer them, which has to involve the physio appointment. And the physio appointments are pretty limited, they are sort of like, tend to be a single appointment with exercise advice rather than anything more. (GP 5009-12)

But secondly there's huge economic constraints on a very routine high throughput pathway that five, ten years ago people would be seen routinely up to about 10 years after the operation. Now if they're doing well they get seen once by us and discharged at eight weeks. And that's it. So it's trying to put this advice into the context of a very constrained health system working at the minute. Often people would be seen once in clinic to talk about the operation. They'd be put on the list. They'd be seen at pre-assessment, they'd get the operation, two weeks checks, eight week check, goodbye. (S 4002-5 A)

THEME: Perceptions regarding an occupational advice intervention

Perceived need

I think there's certainly, it does feel like it's almost inevitable that we're moving towards doing more and more knee replacements on people younger who are still working or older who are still working because as a result of kind of factors generally in society (AHP/N 3001)

I suppose the long and short of it is that we don't tend to operate when people are under the age of 50 for knee replacement. (AHP/N 3004-7a)

If they're not discussing anything about work until they come back at six to eight weeks post-op, some of them could feasibly already be back at work by then couldn't they? (AHP/N 3004-7a)

Not very many at all, I would say less than one in ten would be of working age. Most people will be in their 60s, 70s. But of course we're all working longer now. (GP 5015)

If you look at the average age of a joint replacement it's in the '70s, so an awful lot of our patients aren't working. So it's pointless going on and telling them all about work when they're not at work. (S 4006)

Timing

Well probably it's not the kind of thing that the surgeon will talk about when they first go to the appointment to be put on the waiting list. But equally I think that's probably when it should be. (AHP/N 3008)

but it's post (op), I think definitely people are just sent home, kind of left. (AHP/N 3011)

At pre-op sort of time. Pre surgery, before they've got a date (GP 5004)

Well I would've thought as soon as they know they're going to have one done really, the sooner the better. Because as soon as they're going to start sharing that information with their employers and their employers have a better understanding of what's likely to happen and how long they're likely to be off and what's likely to be needed afterwards, you know, they're going to be, if there a half-decent employer anyway, you can then take that on board before they've actually gone off. (GP 5002)

..so really the best time to start, the GP should talk to the patient to start with. But they've got less time. Before a GP refers a patient what they should say to the patient is that you realise you could be off work for six weeks to three months depending on what you do. And patients will go hang on, I can't afford the time away from work. So that's when it should start…. (S 4007)

Format

In social media now, they Google things, don't they? They look up things. The younger generation, not so much obviously the older generation (AHP/N 3011)

We give away so much stuff and so many books and leaflets and whatever, sometimes it just gets thrown in a drawer and lost and whatever, that more paper might not be the way in. (AHP/N 3011)

a sort of thing that they could take away and sort of just show to their family, show to their employer. So they've got something written down to show people to say I can't do this but I can do this, that sort of thing. (AHP/N 3010)

… yeah I'm sure children still have 'red books'. It's something that's given to the mum when the baby's born and you take it with your baby to all health professionals involved and they sign off all their bits. …. that would allow physio and OT to sort of do their bit and make sure that everybody had optimised the care for the patient. (GP 5003)

So I think predominantly written stuff is ideal, but there has to be the opportunity for some sort of either face to face or telephone interaction. Face to face probably better, so that they can be truly personalised, but we know from various studies that patients tend to forget everything that, 90% of what's been said as soon as they leave the consulting room. So I think there has to be the backup of something written that they can go back to, and then the contact details so that when they think of the question three days later they can either phone or email somebody just to ask that question.(S 4008)

Content

…different jobs, so the patient could see which category they fitted into and by that whether their job was a particularly high demand job in terms of it was a very physical job, it was climbing ladders, it was being on their feet for long periods of the day (AHP/N 3001)

I think the main thing is having advice slightly specific to the type of work people are doing. (GP 5013)

I think it would need to cover the guidance from the legal point of view in what you definitely can't do, and then also about common complications and common pitfalls, and also giving people ideas of recovery times in general so people know what the impact is likely to be. I think a lot of this is covered by the orthopaedic team, whether it's covered as in depth as possibly it could be but definitely making sure the patients are as well educated about the process as they can be before entering it ... (GP 5016)

I would assume you'd paint the scenario if you're doing well you can do this and this would be your average and, you know, so I assume it would be common sense directed. (S 4001)

What might be quite good is testimonials. These are my last 100 patients who work. Let's just get them all to write a paragraph about what they did or what they thought, when did they go back to work? What was the reality, what was the hardest thing? And that might be, it's something I always keep thinking that I should do at some stage. And then you just produce that and give it to the patients, and go look this is what my last 100 patients said about going back to work. (S 4007)

Delivery

I'm sure if we've got the general consultant consensus and some guidance about the advice that we could provide that would be something that the [nurse] practitioner would be absolutely happy to help with and to give their guidance. And we've got a very cohesive team so we are direct contact as I said with our registrars but as well with our occupational therapists and physiotherapists so we all work on the same department and if there's something that then is out of our range we've got ways of getting the advice straight away from other sources. But that would be something that it wouldn't cause any problem for us to include that sort of advice. (AHP/N 3009)

And then the person dealing with them needs to have a bit of an idea about the best advice, because advice will vary depending on the individual person's work. And it needs to be tailored to that individual, all pre-op. F: So people who would give advice, would they be, because I am just thinking would every doctor be able to do that to know that, they probably wouldn't would they? (GP 5009-12)

Specifically talking about occupation - I don't know really, each and all of us I suppose. (S 4007)

It's difficult when you don't see the patient until the clinic at eight weeks after their surgery to make any recommendations on returning to work up until that point. You can from that point on. So someone like the physiotherapist who has perhaps seen them weekly at best or twice weekly for the first six weeks or so, they're probably in a better position or have more time to judge recovery, achievements, expectations ….as to when realistically they would be able to return to work. (S 4002-5)

But it seems to me you'd need somebody who's got some insight into occupational-type medicine or occupational therapy related to workplace, something like that, and somebody who's got the time. I don't think it's me. (S 4006)

Measuring the impact of the intervention

Well, you could look at simple: time to return to work. Because it might be actually that you get more rapid return to work by giving more information and more advice. You could look at their satisfaction with care throughout the procedure, whether that be encompassing everything from their experience from the general practice, the sick notes, their recovery, their physio and everything else. So actually, the patient's satisfaction and actually recovery times are the important ones as well. (GP 5014)

Well the most important would be getting people back to work earlier than they would do otherwise. But you're going to find that's difficult to get results. It's going to be a bit muddy. People going back to work and then going back on the sick a little bit. So the failure rates of going back to work might be one. But that's not going to be that often. And I suppose it'll all be down to quality of life type stuff at the end of the day, and qualitative stuff. Because I think definite quantitative actions you're going to need very large sample size. (GP 5016)

Appropriate time for return to work. So probably, and that's got to be patient- focused hasn't it, that's got to be the patient feeling they're getting back to work at the time they feel they ought to be getting back to work. Not too early, not too late, just an appropriate and perhaps with feeling that they've been given support to help them achieve that. (S 4006)

Well I suppose the most obvious one is a countrywide snapshot of the average mean return to work, subdivided by desk-based or manual, and then try and improve it by two weeks and see if it happens or not. But to be honest it's not a, you know, not to minimise it, but it's not a prime focus of concern. Getting them through the hazards of ops to make it safely to the car to take them home is an excellent result and then getting them to work's a bonus is a jaundiced view of it. (S 400)

Appendix 6: Supporting information for IM stages 2 and 3

Section 1: Change objectives for each of the performance objectives in the final OPAL intervention

Intervention mapping: PATIENT MATRIX for performance objectives the developed occupational advice intervention tested in the feasibility assessment

RTW = return to work
RTWC = return to work co-ordinator (a designated member of the hospital team)
HOT = Hospital Orthopaedic Team

Behaviour to be targeted: Patient makes successful return to work following surgery

Performance Objective	Knowledge & Awareness	Skills & Self-efficacy	Attitudes/Beliefs/Emotions	Outcome expectations	Perceived norms
PRE-SURGERY					
PO.1 Patient completes occupational checklist prior to appointment with surgeon	Explains that completing the occupational checklist aims to inform the surgeon about their work activities and demands	Expresses confidence in completing the occupational checklist	States that completing an occupational checklist will help to inform the surgeon about their work activities and demands and facilitate an informed decision about surgery	States that completing an occupational checklist will facilitate an informed decision about surgery and positive RTW outcome	Recognises that nowadays patients are being encouraged to take an active part in their care Recognises that RTW is now considered a health outcome
PO.2 Patient makes informed decision about surgery with respect to work	Appraises the general risks/benefits of surgery and RTW rates Appraises the likely impact of surgery on their ability to do their own job States that they have received sufficient information about surgery	Expresses confidence in ability to make informed decision about surgery Demonstrates ability to process information about surgical procedure and make informed choice	Expresses willingness to take responsibility for surgical decision Demonstrates appropriate emotional response with regard to their decision	Describes a realistic expectation of RTW outcome following surgery	Perceives that it is usual for patients to make an informed decision about surgery with respect to their work Recognises that nowadays patients are being encouraged to take an active part in their care Recognises that RTW is now considered a health

					outcome
PO.3 Patient acquaints self with key information about recovery and RTW provided in the RTW workbook	Describes the key advice and information concerning recovery and RTW e.g. how work modifications (hours and duties) can facilitate RTW the risks of extended sickness absence the risks of RTW too quickly	Expresses confidence in their ability to acquaint themselves with key information about recovery and RTW provided in the RTW workbook	States they have a responsibility to acquaint themselves with key information about recovery and RTW provided in the RTW workbook Expresses willingness to take this responsibility to acquaint themselves with key information?	States that having a good understanding about recovery and RTW is likely to lead to a positive RTW outcome	Recognises that patients undergoing surgery acquaint themselves with key information about recovery and RTW provided by the hospital orthopaedic team
PO.4 Patient brings RTW workbook to each hospital appointment including hospital inpatient stay (and discusses with HOT)	Describes that the reason for bringing the RTW workbook to each appointment is to encourage patients and hospital staff to focus on RTW at each appointment	Expresses confidence in their ability to bring the RTW workbook to each hospital appointment	States that it will help their recovery/RTW to bring the RTW workbook to each hospital appointment Expresses willingness to bring RTW workbook to each hospital appointment	Expects that bringing the RTW workbook to each hospital appointment is likely to facilitate a positive RTW outcome	Recognises that nowadays patients are being encouraged to take an active part in their care
PO.5 Patient completes sections of RTW workbook that will help them understand the demands of their work and set an approximate RTW date With employer* as required	Explains that completing the workbook helps them understand the demands of their work and set an approximate RTW date Describes how to complete a RTW workbook and set an approximate RTW date, and how to do this with their employer* if required	Expresses confidence in their ability to complete the sections of the RTW workbook that will help them understand the demands of their work and set an approximate RTW date Expresses confidence in their ability to do this with their employer* if required	Expresses willingness to complete the sections of RTW workbook that will help them understand the demands of their work and set an approximate RTW date Expresses willingness to do this with their employer* if required	Expects that completing the sections of the RTW workbook (with their employer if required) that will help them understand the demands of their work and set an approximate RTW date is likely to lead to a positive RTW outcome	Recognises that RTW is now considered a health outcome Recognises that nowadays patients are being encouraged to take an active part in their care Recognises that employers* are key stakeholders in RTW and involving them at an early stage can facilitate RTW
PO.6 Patient uses	Lists the potential barriers	Expresses confidence in	States that identifying	Expects that identifying and	Recognises that nowadays

information resources provided in workbook to identify and prioritise potential barriers and solutions to a safe and appropriate RTW, and to develop a RTW plan With employer* as required	and solutions to their own RTW and develops a RTW plan, with employer as required. Explains how to identify and prioritise potential barriers and solutions to a safe and appropriate RTW and develop a RTW plan, with employer as required	identifying barriers/facilitators to their own safe and appropriate RTW, and to develop a RTW plan, with employer as required	barriers/facilitators and the development of their RTW plan, with employer as required, will aid their own safe and appropriate RTW	prioritising potential barriers and facilitators to RTW, and developing a RTW plan, with employer as required, will lead to a safe and appropriate RTW	patients are being encouraged to take an active part in their care Recognises that employers* are key stakeholders in RTW and involving them at an early stage can facilitate RTW
PO.7 Patient discusses information within RTW workbook with RTW co-ordinator (at hospital or by phone) to help them further develop their RTW plan. This will include a minimum of 1 contact. The number and duration of further contacts will be governed by patient need based on progress and perceived level of 'risk' of prolonged sickness absence	Describes the process of engaging with their RTWC to further develop a RTW plan: • How • When • Where	Expresses confidence in engaging with the RTWC to help them further develop their a RTW plan Demonstrates how to negotiate a RTW plan with their employer*	States that engaging with the RTWC to help them further their RTW plan will aid their RTW Expresses acceptance that a RTW plan will aid their RTW	Expects that engaging with the RTWC to help them further develop their RTW plan will lead to a positive RTW outcome	Recognises that the ideal RTW process relies on coordination and joint planning between healthcare, the patient and their employer
PO.8 Patient provides employer* with written information provided by the HOT about their planned surgery and recovery/RTW advice	Describes the information that they can provide to their employer*/workplace, and who should receive it	Expresses confidence in their ability to provide this information to their employer*/workplace	States that providing their employer* with written information provided by the HOT about their planned surgery and recovery/RTW advice will facilitate their RTW.	Employer* is informed about the surgical process and RTW	Recognises that employers do not necessarily know about this type of surgery and how best to facilitate RTW Recognises that employers* are key stakeholders in RTW and involving them at an early stage can facilitate RTW

POST SURGERY					
PO.9 Patient meets with their employer* to discuss their recovery and RTW plan	Appraises the likely impact of surgery on their RTW, prior to their operation Describes how to discuss their RTW with their employer*	Expresses their ability to discuss their recovery and RTW plan with their employer*/workplace Expresses confidence in their ability to discuss their recovery and RTW plan with their employer*/workplace	Expresses willingness to discuss their recovery and RTW plan with their employer*	Employer* is informed about patient's recovery and RTW plan	Recognises that nowadays patients are being encouraged to take an active part in their care Recognises that employers* are key stakeholders in RTW and involving them at an early stage can facilitate RTW
PO.10 Patient communicates with employer* regarding surgical outcome and progress/recovery	Appraises the likely impact of surgery on their RTW, post-surgery	Expresses confidence in their ability to communicate with their employer* regarding surgical outcomes and recovery (could be by phone, in writing, in person)	States their willingness to communicate their surgical outcome and progress with their employer*	Expects that communicating with their employer* regarding surgical outcome and progress will lead to a positive RTW outcome	Recognises that communication with their employer* is key to a successful RTW outcome
PO.11 Patient revises RTW plan following surgery as necessary with their employer* and hospital staff	Explains why a RTW plan may need to be revised following surgery Describes how they will revise their RTW plan if necessary with their employer* and hospital staff	Expresses confidence in negotiating a revised RTW plan with their employer* and hospital staff	States their willingness to revise their RTW plan following surgery	Expects that revising the RTW plan following surgery will provide a more positive RTW experience	Recognises that nowadays patients are being encouraged to take an active part in their care Recognises that the ideal RTW process relies on coordination and joint planning between healthcare, the patient and their employer Recognise that RTW is an ongoing process that needs to monitored
PO.12 Patient engages with RTWC via RTW	Recalls the process of engaging with the RTWC:	Expresses confidence in their ability to engage with	States that engaging with the RTWC via the RTW	Expects that engaging with the RTWC via RTW	Recognises that it is considered normal for

helpline/answering service if having problems related to RTW for up to 16 weeks post- surgery	• Who to contact • How to contact them • When to contact them • What action is to be expected and when	the RTWC if they are having problems post-discharge	helpline/answering service will potentially alleviate any RTW problems Expresses willingness to engage with this service if problems relating to RTW emerge	helpline/answering service if having problems related to RTW will help the patient to overcome the problem	patients to ask clinicians for help regarding problems at work, even after discharge from the service
PO.13 Patient adheres to postoperative rehabilitation plan and advice	Describes their postoperative rehabilitation plan: • What • When • Where • Who with Describes risks of not adhering to rehabilitation plan	Expresses ability to attend/travel to postoperative rehabilitation sessions if required Expresses confidence about adhering to postoperative rehabilitation plan	States that adhering to their postoperative rehabilitation plan is important for their recovery/RTW Expresses willingness to adhere to postoperative rehabilitation plan and advice	Expects that adhering to their postoperative rehabilitation plan will have a positive impact on RTW	Recognises that other patients undergoing surgery take an active part in postop rehabilitation Recognises that nowadays patients are being encouraged to take an active part in their care

*Not all patients will have an employer: Self-employed - POs referring to employer*s do not apply, although patient encouraged to undertake these objectives with colleagues/customers where appropriate. Carer - POs referring to employer*s do not apply, although patient encouraged to undertake these objectives with other stakeholders (e.g. recipient of care, co-carers) if appropriate. Volunteer - 'Employer*' may include manager/supervisor of voluntary work

Intervention mapping: STAFF MATRIX for performance objectives the developed occupational advice intervention tested in the feasibility assessment

HOT = Hospital Orthopaedic Team
OPALC = OPAL Champion. Each within the HOT to have an identified OPALC who is responsible for ensuring that a member/members of their team meet the performance objectives
RTW = return to work
RTWC = return to work co-ordinator (an existing member of the HOT team trained up for this role, e.g. nurse, physio, occupational therapist)

Behaviour to be targeted: Work-focused advice and support is provided by the HOT

Performance Objective	**Knowledge & Awareness**	**Skills & Self-efficacy**	**Attitudes/Beliefs/Expectations**	**Perceived norms**
PRE-SURGERY				
PO.1 The *HOT*: • Identifies existing team members to act as *RTWC* and deputy • Identifies existing staff members to act as *OPALCs* for their team: -ward -inpatient therapy team -outpatient clinic -pre-assessment and education • Develops a phone line / answerphone service for RTW patients to contact *RTWC* if they are having problems regarding RTW	Members of HOT describe role and responsibility of the RTWC and OPALCs Members of HOT state identity of the RTWC, their deputy, and OPALCs Members of HOT describe how to contact the RTWC, their deputy, and OPALCs Members of HOT describe how patients will use the phone line / answerphone service to contact the RTWC	Members of the HOT are confident that they are able to • Identify existing team members to act as RTWC and Deputy • Identify existing staff members to act as *OPALCs* for their team: -ward -inpatient therapy team -outpatient clinic -pre-assessment and education • Develop a phone line / answerphone service for RTW patients to contact *RTWC* if they are having problems regarding RTW	Members of the HOT state that the following actions will facilitate patients in RTW: • Identifying existing team members to act as RTWC and Deputy • Identifying existing staff members to act as *OPALCs* for their team: -ward -inpatient therapy team -outpatient clinic -pre-assessment and education • Developing a phone line / answerphone service for RTW patients to contact *RTWC* if they are having problems regarding RTW	Members of the HOT recognise that the NHS now sees RTW as a measure of health and recovery from surgery Members of HOT recognise that patients undergoing THR and TKR are increasingly likely to RTW following surgery Members of the HOT recognise that HOTs have a role in supporting patients undergoing THR/TKR in RTW following surgery
PO.2 *The outpatient clinic team* identifies RTW patients in clinic	Members of the outpatient clinic team describe the process of	Members of the outpatient clinic team express confidence in their	Members of the outpatient clinic team state that identifying RTW	Members of the outpatient clinic team recognise that identifying

prior to consultation with surgical team	identifying RTW patients: • how • when • where	ability to identify RTW patients in clinic	patients in clinic will help the surgeon / patient make an informed decision about surgery with regard to RTW	RTW patients in clinic prior to appointment with surgeon is good practice
PO.3 *The outpatient clinic team* requests RTW patients to complete occupational checklist prior to consultation with surgeo nand explain its purpose to the patient, model completion if necessary and give positive feedback on completion *The outpatient clinic team* gives completed occupational checklist to surgeon prior to patient's appointment	Members of the outpatient clinic team describe the process of asking RTW patients to complete an occupational checklist and giving it to the surgeon: • how • when • where Members of the outpatient clinic team describe the process of modelling completion of the occupational checklist and giving positive feedback on its completion	Members of the outpatient clinic team express confidence in their ability to ask RTW patients to complete an occupational checklist in clinic and giving it to the surgeon prior to patient's appointment Members of the outpatient clinic team express confidence in modelling completion of the occupational checklist and giving positive feedback on its completion	Members of the outpatient clinic team state that asking RTW patients to complete an occupational checklist in clinic will help the surgeon and patient make a more informed decision about surgery with regard to RTW Members of the outpatient clinic team state that modelling completion of the occupational checklist and giving positive feedback on its completion will help the patient to complete the checklist accurately and help the patient and surgeon make a more informed decision about surgery with regard to RTW	Members of the outpatient clinic team recognise that preparing the patient and surgeon to discuss the patient's RTW patients is good practice Members of the outpatient clinic team state that modelling completion of the occupational checklist and giving positive feedback on its completion is in accordance with good practice
PO.4 *Surgeon* discusses pros and cons of surgery with patient including expected timescales of surgery and recovery – in relation to the patient's usual work and refers to/responds positively to the patient's occupational checklist to enable patient to make informed decision about surgery; supports patient autonomy Provides patient with personal risk feedback on potential RTW	Surgeon describes current evidence regarding pros and cons of surgery in relation to work including expected timescales of surgery and recovery Surgeon describes the process by which they use occupational checklist Surgeon describes process of providing patient with personal risk feedback on potential RTW outcomes	Surgeon expresses confidence in discussing/answering patient's questions about RTW and their decision to have surgery in relation to their work Surgeon expresses confidence in using the patient's occupational checklist as a basis for their discussion with patient about surgery Surgeon expresses confidence in providing patient with personal	Surgeon states that surgeons should encourage patients to take an active role in the decision about surgery in relation to RTW Surgeon states that using the patient's occupational checklist as a basis for their discussion about surgery will facilitate their discussion about surgery Surgeon states that providing patient with personal risk feedback on potential RTW	Surgeons recognise that discussing the pros and cons of surgery with patient including expected timescales of surgery and recovery – in relation to the patient's usual work - is good practice Surgeon states that using the patient's occupational checklist as a basis for their discussion about surgery is good practice Surgeon states that providing

outcomes Explores patients questions and concerns Informs listed patients that they will be given a RTW workbook to read and why, complete where possible, bring to each subsequent appointment, presenting positive message Informs listed patients that they will receive an Employer workbook and why, that the patient will be contacted by a RTWC at least 4 weeks prior to surgery and why. Names them. Explains that RTW plan may need to be revised and that RTWC will help with this Summarises and records patients RTW status/outcome in all clinic notes and following each appointment Communicates with GP at point patient is discharged from orthopaedic surgical care outlining current RTW status and progress and on-going therapy received	Surgeon describes process of enabling patient to make informed decision about surgery; supporting patient autonomy Surgeon describes the process of: -Exploring patients questions and concerns -Informing listed patients that they will be given a RTW workbook to read and why, complete where possible, bring to each subsequent appointment, presenting positive message -Informing listed patients that they will receive an Employer workbook and why, that the patient will be contacted by a RTWC at least 4 weeks prior to surgery and why. Names them. -Explaining that RTW plan may need to be revised and that RTWC will help with this -Summarising and recording patients RTW status/outcome in all clinic notes and following each appointment -Communicating with GP at point patient is discharged from	risk feedback on potential RTW outcomes Surgeon expresses confidence in enabling patient to make informed decision about surgery; supporting patient autonomy Surgeon expresses confidence in: -Exploring patients questions and concerns -Informing listed patients that they will be given a RTW workbook to read and why, complete where possible, bring to each subsequent appointment, presenting positive message -Informing listed patients that they will receive an Employer workbook and why, that the patient will be contacted by a RTWC at least 4 weeks prior to surgery and why. Names them. -Explaining that RTW plan may need to be revised and that RTWC will help with this -Summarising and recording patients RTW status/outcome in all clinic notes and following each appointment	outcomes and enabling patient to make informed decision about surgery – supporting patient autonomy - will facilitate their RTW Surgeon states that the patient's RTW will be facilitated by: -Exploring patients questions and concerns -Informing listed patients that they will be given a RTW workbook to read and why, complete where possible, bring to each subsequent appointment, presenting positive message -Informing listed patients that they will receive an Employer workbook and why, that the patient will be contacted by a RTWC at least 4 weeks prior to surgery and why. Names them. -Explaining that RTW plan may need to be revised and that RTWC will help with this -Summarising and recording patients RTW status/outcome in all clinic notes and following each appointment -Communicating with GP at point	patient with personal risk feedback on potential RTW outcomes and enabling patient to make informed decision about surgery – supporting patient autonomy -is good practice Surgeon recognises that it is good practice to: -Exploring patients questions and concerns -Inform listed patients that they will be given a RTW workbook to read and why, complete where possible, bring to each subsequent appointment, presenting positive message -Inform listed patients that they will receive an Employer workbook and why, that the patient will be contacted by a RTWC at least 4 weeks prior to surgery and why. Names them. -Explain that RTW plan may need to be revised and that RTWC will help with this -Summarise and record patients RTW status/outcome in all clinic notes and following each appointment

	orthopaedic surgical care outlining current RTW status and progress and on-going therapy received	-Communicating with GP at point patient is discharged from orthopaedic surgical care outlining current RTW status and progress and on-going therapy received	patient is discharged from orthopaedic surgical care outlining current RTW status and progress and on-going therapy received	-Communicate with GP at point patient is discharged from orthopaedic surgical care outlining current RTW status and progress and on-going therapy received
PO.5 *The outpatient clinic team* provides all RTW patients listed for surgery with written RTW workbook and gain contact details for RTWC to contact patient as completed in occupational checklist Outpatient clinic staff inform/encourage patient to bring RTW workbook to each hospital appointment, and draw attention to this instruction in the workbook Discuss potential reasons why this might not happen, and formulate solutions with patient Recommend patients read workbook and complete as much as they can (show relevant sections); present workbook positively and refer to coping model examples Recommend patient asks employer to assist patient in completion if wishes and suggests who this might include, and	Members of the outpatient clinic team describe the process of giving patients a RTW workbook and gaining contact details for RTWC to contact patient: • how • when • where Outpatient clinic staff describe the process of: - informing/encouraging patient to bring RTW workbook to each hospital appointment, and drawing attention to this instruction in the workbook - discussing potential reasons why this might not happen, and formulating solutions with patient Outpatient clinic staff describe the process of recommending that patients read workbook and complete as much as they can (show relevant sections) ; presenting workbook positively and referring to coping model examples Outpatient clinic staff describe	Members of the outpatient clinic team express confidence in their ability to give patients a RTW workbook and gain contact details for RTWC to contact patient Outpatient clinic staff express confidence in their ability to: - inform/encourage patient to bring RTW workbook to each hospital appointment, and to draw attention to this instruction in the workbook - discuss potential reasons why this might not happen, and formulating solutions with patient Outpatient clinic staff express confidence in their ability to of recommend to patients that they read workbook and complete as much as they can (show relevant sections); presenting the workbook positively and referring to coping model examples Outpatient clinic staff express confidence in recommending that patients asks employer to assist	Members of the outpatient clinic team state that giving patients a RTW workbook and RTWC contact phone/email will facilitate the patient's RTW Outpatient clinic staff state that: - informing/encouraging patient to bring RTW workbook to each hospital appointment, and drawing attention to this instruction in the workbook and discussing potential reasons why this might not happen/formulating solutions will facilitate their RTW Outpatient clinic state that recommending to patients that they read workbook and complete as much as they can (show relevant sections); presenting the workbook positively and referring to coping model examples will facilitate the patient's RTW Outpatient clinic staff state that recommending that patients asks employer to assist patient in	Members of the outpatient clinic team recognise that it is good practice to give patients RTW information and support at an early stage Outpatient clinic staff recognise that informing/encouraging patient to bring RTW workbook to each hospital appointment, drawing attention to this instruction, and discussing potential reasons why this might not happen, and formulating solutions with the patient is good practice Outpatient clinic recognise that recommending to patients that they read workbook and complete as much as they can (show relevant sections); presenting the workbook positively and referring to coping model examples is good practice Outpatient clinic staff recognise that recommending that patients asks employer to assist patient in completion if wishes and

discuss possible difficulties and solutions re communicating with employer Outpatient clinic staff explain to patient that the RTWC will contact them at least 4 weeks prior to surgery about their RTW plan	the process of recommending that patients asks employer to assist patient in completion if wishes and suggests who this might include, and discuss possible difficulties and solutions re communicating with employer Outpatient clinic staff describe the process of explaining to patient that the RTWC will contact them about their RTW plan	patient in completion if wishes and suggests who this might include, and discuss possible difficulties and solutions re communicating with employer Outpatient clinic staff express confidence in their ability to explain to patient that the RTWC will contact them about their RTW plan	completion if wishes and suggesting who this might include, and discussing possible difficulties and solutions re communicating with employer will facilitate their RTW Outpatient clinic staff state that explaining to patient that the RTWC will contact them about their RTW plan will facilitate RTW	suggesting who this might include, and discussing possible difficulties and solutions re communicating with employer is good practice Outpatient clinic staff recognise that explaining to patient that the RTWC will contact them about their RTW plan is good practice
PO.6 *The outpatient clinic team* provides all RTW patients listed for surgery with 'Employer RTW workbook' to share with their employer/colleagues* Outpatient clinic staff inform/encourage patient that giving the Employer RTW workbook to employer/ colleagues will help them understand surgery and prepare for patient's RTW Suggests that patient might wish to meet with their employer to discuss RTW and who this might include Outpatient clinic staff suggest individuals in the workplace who might best receive the Employer TRW workbook	Members of the outpatient clinic team describe the process of giving patients the Employer RTW workbook to share with their employer/colleagues*: • how • when • where Outpatient clinic staff describe process of informing/encouraging patient that giving an Employer RTW workbook to their employer/ colleagues will help them understand surgery and prepare for patient's RTW Outpatient clinic staff describe the process of recommending that patients might wish to meet with their employer to discuss RTW and who this might include	Members of the outpatient clinic team express confidence in their ability to provide patients with Employer RTW workbook Outpatient clinic staff express confidence in their ability to inform/encourage patient that giving the 'Employer RTW workbook' to employer/ colleagues will help them understand surgery and prepare for patient's RTW Outpatient clinic staff express confidence in recommending that patients might wish to meet with their employer to discuss RTW and who this might include Outpatient clinic staff express confidence in their ability to suggest individuals in the	Members of the outpatient clinic team state that giving patients an Employer RTW workbook to share with their employer/colleagues will facilitate the patient's RTW Outpatient clinic staff state that informing/encouraging patient to give the 'Employer RTW workbook' to employer/ colleagues will help them understand surgery and prepare for patient's RTW Outpatient clinic staff state that recommending that patients might wish to meet with their employer to discuss RTW and who this might include will facilitate their RTW Outpatient clinic staff state that suggesting individuals in the	Members of the outpatient clinic team recognise that it is good practice to educate/inform patients' employers/colleagues* about RTW information at an early stage Outpatient clinic staff recognise that it is good practice to inform/encourage patient to give the 'Employer RTW workbook' to employer/ colleagues. Outpatient clinic staff recognises that recommending that patients might wish to meet with their employer to discuss RTW and who this might include is good practice Outpatient clinic staff recognise

	Outpatient clinic staff describe process of suggesting individuals in the workplace who might best receive the Employer RTW workbook	workplace who might best receive the employer information	workplace who might best receive the employer information will facilitate the patient's RTW	that it is good practice to suggest individuals in the workplace who might best receive the Employer RTW workbook
PO.7 *The outpatient clinic team* collects patient's completed occupational checklist from surgeon and forwards to RTWC	Members of the outpatient clinic team describe the process of passing patients' completed occupational checklists to RTWC • how • when • where	Members of the outpatient clinic express confidence in their ability to pass patients' completed occupational checklists to RTWC	Members of the outpatient clinic team state that passing patients' completed occupational checklists to RTWC will help RTWC facilitate the patient's RTW	Members of the outpatient clinic team recognise that it is good practice for HOTs to communicate patients occupational status to RTWC
PO.8 *The pre-operative assessment and education teams* routinely include the topic of RTW in their clinics with examples of work demands, barriers and facilitators to RTW, RTW plans, importance of adhering to postop rehab plan/pacing up activities *The pre-operative assessment and education teams* ask if patients have brought their RTW workbook to appointment, praise patients, refer positively to content and use of the workbooks, and promote engagement with the RTWC	Members of the preop assessment and education teams describe how to routinely include the topic of RTW in their clinics with examples of work demands, barriers and facilitators to RTW, RTW plans, importance of adhering to postop rehab plan/pacing up activities Members of the pre-operative assessment and education teams describe the process of asking if patients have brought their RTW workbook to appointment, praising patients and referring positively to content and use of the workbooks, and promoting engagement with the RTWC	Members of preop assessment and education team express confidence in routinely include the topic of RTW in their clinics with examples of work demands, barriers and facilitators to RTW, RTW plans, importance of adhering to postop rehab plan/pacing up activities Members of the pre-operative assessment and education teams express confidence in asking if patients have brought their RTW workbook to appointment, praising patients and referring positively to content and use of the workbooks, and promoting engagement with the RTWC	Members of preop assessment and education team state that routinely including the topic of RTW in their clinics with examples of work demands, barriers and facilitators to RTW, RTW plans, importance of adhering to postop rehab plan/pacing up activities will facilitate the patient's decision about surgery and their RTW Members of the pre-operative assessment and education teams state that asking if patients have brought their RTW workbook to appointment, praising patients and referring positively to content and use of the workbooks, and promoting engagement with the RTWC will facilitate the patients RTW	Members of preop assessment and education team recognise that routinely including the topic of RTW in their clinics with examples of work demands, barriers and facilitators to RTW, RTW plans, importance of adhering to postop rehab plan/pacing up activities is good practice Members of the pre-operative assessment and education teams recognise that asking if patients have brought their RTW workbook to appointment, praising patients and referring positively to content and use of the workbooks, and promoting engagement with the RTWC is good practice
PO.9 *RTWC* contacts all RTW	The RTWC describes the process	The RTWC expresses confidence	The RTWC states that by	The RTWC recognises that

patients (phone/meet ups) at least 4 weeks prior to surgery to review: • information provided in the occupational checklist • information in the RTW workbook including - Current job demands - Provisional RTW date - Potential barriers and solutions to safe and appropriate RTW - The patient's provisional RTW plan All patients receive at least 1 contact with the RTW co-ordinator. This may be integrated within the pre-assessment / pre-admission process or done by phone. The number and duration of additional contacts will be governed by patient need based on progress and perceived level of 'risk' Refers positively to RTW workbook during discussions with patient: - Praises patient for bringing workbook to appointments	of how, when and where they will: • Contact RTW patients • Review the patients occupational checklist • Review information in the RTW workbook including - Current job demands - Provisional RTW date - Potential barriers and solutions to safe and appropriate RTW - The patient's provisional RTW plan • Encourage discussion about/coach patient regarding communication with patients employer • Discuss the possibility of needing to revise RTW plan following surgery • Determine the number of patient contacts • Refer positively to RTW workbook during discussions with patient: - Praise patient for bringing workbook to appointments - Remind patient to bring workbook on	in their ability to: • Contact RTW patients • Review the patients occupational checklist • Review information in the RTW workbook including - Current job demands - Provisional RTW date - Potential barriers and solutions to safe and appropriate RTW - The patient's provisional RTW plan • Encourage discussion about/coach patient regarding communication with patients employer • Discuss the possibility of needing to revise RTW plan following surgery • Determine the number of patient contacts • Refer positively to RTW workbook during discussions with patient: - Praise patient for bringing workbook to appointments - Remind patient to bring workbook on admission - Refer to other	providing targeted individual RTW support and advice through contacting patients prior to surgery will facilitate their RTW	providing targeted individual RTW support and advice through an contacting patients prior to surgery is good practice

- Reminds patient to bring workbook on admission - Refers to other patient examples /models of job demands/RTW plans etc Encourages discussion about/coaches patient regarding communication with patients employer Refers on/signposts where appropriate Sets goals/steps with patient Discusses the possibility of needing to revise RTW plan following surgery Documents all consultations in RTWC workbook	admission - Refer to other patient examples /models of job demands/RTW plans etc • Refer on/signpost where appropriate • Sets goals/steps with patient • Discuss the possibility of needing to revise RTW plan following surgery • Documenting all consultations in RTWC workbook	patient examples /models of job demands/RTW plans etc • Refer on/signpost where appropriate • Set goals/steps with patient • Discuss the possibility of needing to revise RTW plan following surgery • Documenting all consultations in RTWC workbook		
PO.10 *RTWC* highlights RTW patients to teams managing *pre-operative education and assessment* and records this action in RTWC workbook	The RTWC describes the process of highlighting RTW patients to the pre-operative education and assessment team and recording this action in RTWC workbook • How • When • Where	The RTWC expresses confidence in their ability to highlight RTW patients to the pre-operative education and assessment team and recording this action in RTWC workbook	The RTWC states that highlighting RTW patients to the pre-operative education and assessment team and recording this action in RTWC workbook will facilitate the patient's decision about surgery and their RTW	The RTWC recognises that highlighting RTW patients to the pre-operative education and assessment team and recording this action in RTWC workbook is good practice
PO.11 *RTWC* highlights RTW patients to *the ward teams* when admitted for surgery and records	The RTWC describes the process of highlighting RTW patients to the ward team and recording this	The RTWC expresses confidence in their ability to highlight RTW patients to the ward team and	The RTWC states that highlighting RTW patients to the ward team and recording this action in RTWC	The RTWC states that highlighting RTW patients to the ward team and recording this action in RTWC

this action in the RTWC workbook	action in RTWC workbook when patient admitted: • How • When • Where	recording this action in RTWC workbook	workbook will facilitate the patient's RTW	workbook is good practice
PO.12 *The ward team (nurse and doctor)* check RTW patients have brought workbook into hospital and if not determine the reason for this. Give praise if workbook brought in. Refer positively to RTW workbook.	*The ward team (nurse and doctor)* describe the process of checking that RTW patients have brought workbook into hospital, and if not, determining the reason for this; giving praise if workbook brought in; referring positively to RTW workbook.	*The ward team (nurse and doctor)* describe the process of checking that RTW patients have brought workbook into hospital, and if not, determining the reason for this. Give praise if workbook brought in. Refer positively to RTW workbook.	*The ward team (nurse and doctor)* state that checking that RTW patients have brought workbook into hospital, and if not, determining the reason for this, giving praise if workbook brought in and referring positively to RTW workbook will facilitate the patient's RTW.	*The ward team (nurse and doctor)* recognise that checking that RTW patients have brought workbook into hospital, and if not, determining the reason for this, giving praise if workbook brought in and referring positively to RTW workbook is best practice.
POST-SURGERY				
PO.13 *Ward therapists* ask RTW patients if they have brought workbook into hospital, and if not determine the reason for this. Give praise if workbook brought in. Refer positively to RTW workbook, enter notes as appropriate Liaise with RTWC to update them on the patient's postop recovery prior to discharge	*Ward therapists* describe the process of: - asking RTW patients if they have brought workbook into hospital, and if not determine the reason for this. Give praise if workbook brought in. -Referring positively to RTW workbook, and entering in notes as appropriate -Liaising with RTWC to update them on the patient's postop recovery prior to discharge	*Ward therapists* express confidence in - asking RTW patients if they have brought workbook into hospital, and if not determining the reason for this. Giving praise if workbook brought in. -Referring positively to RTW workbook, and entering in notes as appropriate -Liaising with RTWC to update them on the patient's postop recovery prior to discharge	*Ward therapists* state that: - asking RTW patients if they have brought workbook into hospital, and if not determine the reason for this and giving praise if workbook brought in. -Referring positively to RTW workbook, and entering in notes as appropriate -Liaising with RTWC to update them on the patient's postop recovery prior to discharge Will facilitate RTW.	*Ward therapists* recognise that it is good practice to: - ask RTW patients if they have brought workbook into hospital, and if not determine the reason for this, and give praise if workbook brought in. -refer positively to RTW workbook, and enter in notes as appropriate -Liaise with RTWC to update them on the patient's postop recovery prior to discharge
PO.14 *The RTWC* liaises with *inpatient teams* post-operatively to determine whether there are any issues with early recovery	The RTWC describes the process of liaising with inpatient teams post-operatively to determine whether there are any issues with	The RTWC expresses confidence in their ability to liaise with the inpatient therapy team regarding patient's post-op recovery	The RTWC states that liaising with the inpatient therapy team regarding patient's post-op recovery will facilitate the	The RTWC recognises that liaising with the inpatient therapy regarding patient's post-op recovery is good practice

that may impact on the RTW plan The *RTWC* revises RTW plan with patient as required and ensures plan is documented in patients RTW workbook The *RTWC* supports post-operative rehab plans and problem-solves potential barriers to adherence with patient	early recovery that may impact on the RTW plan: • How • When • Where The *RTWC* describes the process of revising the RTW plan with patient as required and ensures plan is documented in patients RTW workbook The *RTWC* describes the process of supporting post-operative rehab plans and problem-solving potential barriers to adherence with patient	The *RTWC* expresses confidence in revising the RTW plan with patient as required and ensuring plan is documented in patients RTW workbook The *RTWC* expresses confidence in supporting post-operative rehab plans and problem-solving potential barriers to adherence with patient	patient's RTW The *RTWC* states that revising the RTW plan with patient as required and ensuring plan is documented in patients RTW workbook will facilitate the patient's RTW The *RTWC* states that supporting post-operative rehab plans and problem-solving potential barriers to adherence with patient will facilitate the patient's RTW	The *RTWC* states that revising the RTW plan with patient as required and ensuring plan is documented in patients RTW workbook is good practice The *RTWC* states that supporting post-operative rehab plans and problem-solving potential barriers to adherence with patient is good practice
PO.15 *The ward team (nurse/doctor)* summarises patient's expected RTW outcome and RTW plan in ward electronic discharge letter. A copy/copies will be given to the patient to share with employer, therapists etc. *The ward team (nurse/doctor)* praise/refer to the RTW workbook and remind the patient to use the RTW helpline following discharge if they are having problems	The ward nurse and doctor describe how to summarises the patient's expected RTW outcome and RTW plan in ward electronic discharge letter The ward nurse and doctor describe how a copy/copies will be given to the patient to share with employer, therapists *The ward team (nurse/doctor)* describe the process of praising/referring to the RTW workbook and reminding the patient to use the RTW helpline following discharge if they are having problems	The ward nurse and doctor express confidence in their ability to summarise the patient's expected RTW outcome and RTW plan in ward electronic discharge letter The ward nurse express confidence in their ability to give a copy/copies of the discharge letter to the patient to share with employer, therapists *The ward team (nurse/doctor)* express confidence in praising/referring to the RTW workbook and reminding the patient to use the RTW helpline	The ward nurse and doctor state that summarising the patient's expected RTW outcome and plan in the ward electronic discharge letter will facilitate the patient's RTW The ward nurse and doctor state that giving the patient a copy/copies of the electronic discharge letter to share with their employer, therapists etc will facilitate the patient's RTW *The ward team (nurse/doctor)* state that praising/referring to the RTW workbook and reminding the patient to use the RTW	The ward nurse and doctor recognise that summarising the patient's expected RTW outcome and plan in the ward electronic discharge letter is good practice The ward nurse and doctor recognise that giving the patient a copy/copies of the electronic discharge letter to share with their employer, therapists etc is good practice *The ward team (nurse/doctor)* recognise that praising/referring to the RTW workbook and reminding the patient to use the RTW helpline following discharge

The ward team (nurse/doctor/therapist) highlight the importance of adhering to the post op rehab plan	*The ward team (nurse/doctor/therapist)* describe the process of highlighting the importance of adhering to the post op rehab plan	following discharge if they are having problems *The ward team (nurse/doctor/therapist)* express confidence in highlighting the importance of adhering to the post op rehab plan	helpline following discharge if they are having problems will facilitate their RTW *The ward team (nurse/doctor/therapist)* state highlighting the importance of adhering to the post op rehab plan will facilitate their RTW	if they are having problems is good practice *The ward team (nurse/doctor/therapist)* state highlighting the importance of adhering to the post op rehab plan is good practice
PO.16 *The specialist ward nurse/doctor* asks each patient whether they require a fit note on discharge and completes the fit note in accordance with best practice guidelines and the hospital contract, and with reference to the patient's RTW plan in their workbook	*The specialist ward nurse/doctor* describes the process of asking each patient whether they require a fit note on discharge - How - When - Where *The specialist ward nurse/doctor* describes the process of completing the fit note in accordance with best practice guidelines and the hospital contract, and with reference to the patient's RTW plan in their workbook - How - When - Where	*The specialist ward nurse/doctor* express confidence in their ability to ask each patient whether they require a fit note on discharge *The specialist ward nurse/doctor* express confidence in their ability to complete the fit note in accordance with best practice guidelines and the hospital contract, and with reference to the patient's RTW plan in their workbook	*The specialist ward nurse/doctor* state that asking each patient whether they require a fit note on discharge and completing the fit note in accordance with best practice guidelines and the hospital contract, and with reference to the patient's RTW plan in their workbook will facilitate the patient's RTW	*The specialist ward nurse/doctor* recognise that asking each patient whether they require a fit note on discharge and completing the fit note in accordance with best practice guidelines and the hospital contract, and with reference to the patient's RTW plan is good practice
PO.17 *The RTWC* checks the RTW helpline 3 x wk, and triages, advises (e.g. phone call) or refers back to therapy services (based on local service structure and availability) based on individual need.	The RTWC describes the process of checking the helpline and the actions they are required to follow in response to the patient - When - What - How	The RTWC expresses confidence in their ability to check the helpline and in taking the actions they are required to follow in response to the patient	The RTWC states that checking the helpline and taking the actions they are required to follow in response to the patient will facilitate the patient's RTW	The RTWC recognises that checking the helpline and taking the actions they are required to follow in response to the patient is good practice
PO.18 *Surgeon, HOT and*	The surgeon, HOT and outpatient	The surgeon, HOT and outpatient	The surgeon, HOT and outpatient	The surgeon, HOT and outpatient

outpatient therapy teams summarise and record patient's RTW status / outcome in all outpatient clinic notes and following each appointment	therapy teams describe the process of summarising and recording patient's RTW status / outcome in all outpatient clinic notes and following each appointment - What - Where - How	therapy teams express confidence in their ability to summarise and record patient's RTW status / outcome in all outpatient clinic notes and following each appointment	therapy teams state that summarising and recording patient's RTW status / outcome in all outpatient clinic notes and following each appointment will facilitate the patient's RTW	therapy teams recognise that summarising and recording patient's RTW status / outcome in all outpatient clinic notes and following each appointment is good practice
PO.19 *Surgeon and HOT* communicate with GP at point patient is discharged from orthopaedic surgical care, outlining current RTW status and progress and on-going therapy received and encourage engagement with RTWC until16 weeks post-surgery (8 weeks for feasibility study)	Surgeon and HOT describe the process of communicating with the GP at the point that the patient is discharged from orthopaedic surgical care, outlining current RTW status and progress and on-going therapy received	Surgeon and HOT express confidence in their ability to communicate with the GP at the point that the patient is discharged from orthopaedic surgical care, outlining current RTW status and progress and on-going therapy received	Surgeon and HOT state that communicating with the GP at the point that the patient is discharged from orthopaedic surgical care, outlining current RTW status and progress and on-going therapy received will facilitate the patient's RTW	Surgeon and HOT state that communicating with the GP at the point that the patient is discharged from orthopaedic surgical care, outlining current RTW status and progress and on-going therapy received is good practice
PO.20 *RTWC* continues to provide a point of access to RTW advice for patients following discharge from orthopaedic surgical care until 16 weeks post-surgery (8 weeks for feasibility study) Records any changes to patient's RTW progress/status/outcome in RTWC workbook	*RTWC* describes the process of providing a point of access to RTW advice for patients following discharge from orthopaedic surgical care until 16 weeks post-surgery (8 weeks for feasibility study) Describes the process of recording changes to patient's RTW progress/status/outcome in RTWC workbook	*RTWC* expresses confidence in their ability to provide a point of access to RTW advice for patients following discharge from orthopaedic surgical care until 16 weeks post-surgery (8 weeks for feasibility study) Expresses confidence in recording changes to patient's RTW progress/status/outcome in RTWC workbook	*RTWC* state that providing a point of access to RTW advice for patients following discharge from orthopaedic surgical care until 16 weeks post-surgery (8 weeks for feasibility study) will facilitate the patient's RTW States that recording changes to patient's RTW progress/status/outcome in RTWC workbook will facilitate the patient's RTW	*RTWC* recognises that providing a point of access to RTW advice for patients following discharge from orthopaedic surgical care until 16 weeks post-surgery (8 weeks for feasibility study) is good practice Recognises that recording changes to patient's RTW progress/status/outcome in RTWC workbook is good practice

* NB not all patients will have an employer:
Self-employed: POs referring to employers do not apply, although patients are encouraged to undertake these objectives with colleagues/customers where appropriate
Carer: POs referring to employers do not apply, although patients are encouraged to undertake these objectives with other stakeholders (e.g. recipient of care, co-carers) if appropriate
Volunteer: 'Employer' may include manager/supervisor of voluntary work

Section 2: Patient methods and applications

Behaviour being targeted: Patient makes safe and appropriate return to work (RTW)				
KNOWLEDGE/AWARENESS	**Methods**	**Definition**	**Parameters**	**Applications**
Aware that completing an occupational checklist in clinic will inform the surgeon about their work activities and demands	Consciousness raising (HBM)	Providing information about the consequences for a problem behaviour	Raising awareness must be quickly followed by increase in problem solving ability	*Outpatient clinic staff* explain that a completed checklist will help prompt the surgeon and the patient to discuss work issues in full otherwise they might not make the optimum decision about surgery
Knows the risks/benefits of surgery and RTW rates and likely impact of surgery on their ability to do their job	Personalise risk (PAPM)	Provide information about personal costs or risks of action or inaction with respect to target behaviour	Present messages as individual and undeniable	*Individuals receive personal risk feedback from surgeon* on potential RTW outcomes in relation to their work situation (*surgeon prompted about potential risks by referring to patient's occupational checklist)*
Knows key advice and information concerning recovery and RTW e.g. Work modifications Fit notes Restrictions Milestones Sick leave	Coherence and imagery (TIP) Discussion & elaboration (ELM) Reinforcement (LT)	Encourage consideration of a topic in open informal debate Linking a behaviour to any consequence that increases it	Listening to the learner to ensure that the correct schemas are activated	A RTW workbook is provided to patient *by outpatient clinic staff* containing advice and information – sections of text have logical order and clearly related to each other, use graphical representations Contents and use of RTW workbook are referred to in discussions with *all members of HOT: surgeon, RTWC, preoperative education/presentation, ward staff, outpatient therapy staff*
Aware that bringing the RTW workbook to each appointment is expected in order to encourage patients and staff focus on RTW Aware that discussing the content of the RTW workbook with hospital staff is expected to encourage patients and staff	Personalise risk (PAPM) Reinforcement (LT)	Provide information about personal costs or risks of action or inaction with respect to target behaviour Linking a behaviour to any consequence that increases it	Present messages as individual and undeniable Needs to be tailored to the individual, group or organization, follow the	*Outpatient clinic staff inform patient* that they are expected to bring the RTW workbook to enable the HOT advise them on their individual RTW. *Outpatient clinic staff draw attention to this instruction in the workbook* Members of the HOT (*pre-op assessment and education teams, RTWC, ward staff, therapy teams*) ask patients if they have brought their RTW workbook

to focus on RTW		behaviour's rate, frequency or probability	behaviour in time, and seen as a consequence of the behaviour	to each appointment; praise patients for bringing their RTW workbook to each appointment; discuss the content of the patient's RTW workbook at each appointment
Can describe how to assess the demands of their work and set an approximate RTW date, and how to do this with their employer if required	Modelling (SCT) Variety of media (TIP) (repeated exposure) Elaboration (TIP)	Providing an appropriate model Stimulating the learner to add meaning to the information that is processed	Identification with the model, model receives positive reinforcement, coping vs. mastery model Messages that are personally relevant	Examples of other patients' work demands and setting approximate RTW dates *included in workbook/on website* and at *preoperative presentations given by staff* Discussions with *RTWC* and *preoperative education and assessment teams*
Can list the potential barriers and solutions to their own RTW and develop a RTW plan, with employer as required	Modelling (SCT) Variety of media (TIP) Elaboration (TIP)	Providing an appropriate model Stimulating the learner to add meaning to the information that is processed	Identification with the model receives positive reinforcement, coping vs. mastery model Messages that are personally relevant	Examples of other patients' barriers and solutions and RTW plans *included in workbook/on website* and *at preoperative presentations given by staff* Discussions with *RTWC* and *preoperative education and assessment team*
Can describe the process of engaging with their RTWC by phone or face-to-face at the hospital to further develop their RTW plan (how, when, where)	Variety of media? type of reinforcement? More/repeated exposure? (TIP)			Information about engaging with the RTWC is given verbally by *outpatient clinic staff*, in *the patient workbook* and on *website*, on *discharge letter* -and posters on the ward?
Know what information to provide to their employer* /workplace, and who should receive it	Modelling (SCT) Discussion	Providing an appropriate model Encourage consideration of topic in open informal debate	Identification with the model Listening to the learner to ensure that the correct schemas are activated	Examples of other patients' negotiation w employer *Outpatient clinic staff* explain that giving information to their employer will help the employer to understand their surgery and to help them plan the patient's RTW. *Outpatient clinic staff* will suggest the individuals in the workplace who might best receive the employer information.
Know the likely impact of surgery on their	Discussion (ELM)	Encourage	Listening to the learner	*Discussion with/coaching by RTWC*

RTW and how to discuss their RTW with their employer* prior to surgery		consideration of topic in open informal debate	to ensure that the correct schemas are activated	
Know why a RTW plan may need to be revised following surgery and how to do this	Scenario-based risk information (PAP Model)	Providing information that may aid the construction of an image of the ways in which a future loss or accident might occur	Plausible scenario with a cause and scenario	*Discussions with surgeon, RTWC, ward staff, outpatient therapy staff* regarding unexpected outcomes of surgery and how these might impact on their RTW and RTW plan
Know the process of engaging with the RTWC via the RTW helpline following surgery (who, when, how, what to expect)	Variety of media ? type of reinforcement? More/repeated exposure? (TIP)			Information is provided verbally *by RTWC, ward staff, outpatient clinic* staff, in writing in the *patient workbook and on website,* on *discharge letter -and posters* on the ward and in clinic?
Know their postoperative rehabilitation plan and the risks of not adhering to it	Scenario-based risk information (PAP Model)	Providing information that may aid the construction of an image of the ways in which a future loss or accident might occur	Plausible scenario with a cause and scenario	*Discussions with: surgeon, RTWC, pre-op education/presentation, ward staff, outpatient therapy staff* – about the pros and cons of not adhering to their rehabilitation plan
SELF-EFFICACY/SKILLS	**Methods**	**Definition**	**Parameters**	**Application**
Able to complete an occupational checklist prior to appointment with surgeon	Verbal persuasion (SCT) Facilitation (SCT)	Using messages that suggest the participant possesses certain qualities Creating an environment that reduces barriers to action	Credible source Requires identification and removal of barriers	*Outpatient clinic staff* explain that this is an activity that they believe the patient can do Sufficient checklists available, clipboard, pens, time to complete, actual help provided by *outpatient clinic staff*

Able to process information about surgical procedure and make informed choice	Motivational interviewing (SDT) Individualisation (TTM)	Collaborative goal-orientated style of communication Provide opportunities for learners to have personal questions answered or paced according to progress	Must recognize collaboration, exploration, autonomy Personal communication that responds to a learner's needs	*Surgeon supports autonomy of patient in consultation* by valuing patient perspective, offering choices, minimizing pressures *Surgeon facilitates communication* at consultation *RTWC, pre-op assessment and education teams* provide further opportunities to discuss decision with RTW following consultation
Can acquaint themselves with key information about recovery and RTW provided in the RTW workbook	Verbal persuasion (SCT) Goal-setting (GST, TSR)	Using messages that suggest the participant possesses certain qualities Prompting the patient to plan what they will do to reach the target behaviour	Credible source Patient's commitment to the goal	*Outpatient clinic staff* and *RTWC* explain that the workbook has been designed for and approved by patients. *Outpatient clinic staff* and *RTWC* discuss and agree the goal for the next appointment (e.g. to read/complete a particular section of workbook)
Can bring the RTW workbook to each hospital appointment Can discuss their RTW workbook with hospital staff	Verbal persuasion (SCT) Planning coping responses (TSR) Guided practice (SCT)	Using messages that suggest the participant possesses certain qualities Prompting patients to list potential barriers and ways to overcome these Prompting individuals to rehearse and	Credible source Identification of barriers and practice coping response Requires supervision by an experienced person	*Outpatient clinic staff* and *RTWC* explains that this is an activity that they believe patients can do *Outpatient clinic staff* and *RTWC* discuss potential reasons why workbook might not be brought to appointment and formulate solutions with patient *RTWC* models target behaviour a number of times, then asks patient to do the same and gives comments, emphasizing what has been done well

		repeat the behaviour various times, discuss the experience, and provide feedback		
Can complete the sections of the RTW workbook that will help them understand the demands of their work and set an approximate RTW date (with employer* if required)	Modelling (SCT) Planning coping responses (TSR)	Providing an appropriate model Prompting patients to list potential barriers and ways to overcome these	Identification with the model Able to identify barriers and practice coping response	Examples of other patients' job demands *in workbook/on website*, also shared *by RTWC* and *at preoperative presentations given by staff* *Outpatient clinic staff* and *RTWC* discuss potential reasons why patients might struggle to discuss demands with employer, and formulate solutions with patient
Can identify barriers/ facilitators to their own safe and appropriate RTW and develop a RTW plan (with employer if required)	Modelling (SCT) Planning coping responses (TSR	Providing an appropriate model Prompting patients to list potential barriers and ways to overcome these	Identification with the model Able to identify barriers and practice coping response	Examples of other patients' barriers and solutions and RTW plans *in workbook/on website*, also *shared by RTWC and at preoperative presentations given by staff* *Outpatient clinic staff* and *RTWC* discuss potential reasons why patients might struggle to identify barriers/facilitators with employer, and formulate solutions with patient
Can engage with the RTWC to further develop their RTW plan – minimum of one contact	Individualisation	Providing opportunities to have personal questions answered or instructions paced according to individual progress	Personal communication that responds to an individual's needs	*RTWC contacts patient* to help them develop their own individual RTW plan
Can provide written information provided by the HOT about their planned surgery and recovery/RTW advice to their employer*/workplace	Verbal persuasion (SCT)	Using messages that suggest the participant possesses certain qualities	Credible source	*Outpatient clinic staff and RTWC* explain that this is an activity that they believe patients can do *Outpatient clinic staff* give each patient an information booklet to give to their employer
Can meet with their employer* to discuss	Verbal persuasion	Using messages	Credible source	*Outpatient clinic staff* and *RTWC* explains that this is

their recovery and RTW plan	(SCT) Planning coping responses (TSR) Implementation intentions (GST)	that suggest the participant possesses certain qualities Prompting patients to list potential barriers and ways to overcome these Making plans for any obstacles that occur	Identification of barriers and practice coping response	an activity that they believe patients can do *Outpatient clinic staff/RTWC* discuss potential causes and formulate solutions with patient *RTWC* helps patient to prepare an If…Then plan ready if they encounter any difficulties with their employer
Communicate with their employer regarding their surgical outcome and progress/recovery	Guided practice (SCT)	Prompting individuals to rehearse and repeat the behaviour various times, discuss the experience, and provide feedback	Requires supervision by an experienced person	*RTWC* models target behaviour a number of times, then asks patient to do the same and gives comments, emphasizing what has been done well
Negotiate a revised RTW plan with their employer and RTWC if necessary	Verbal persuasion (SCT) Planning coping responses (TSR) Guided practice (SCT) Modelling could be good here too	Using messages that suggest the participant possesses certain qualities Prompting patients to list potential barriers and ways to overcome these Prompting individuals to rehearse and repeat the	Credible source Identification of barriers and practice coping response Requires supervision by an experienced person	*RTWC* explains that this is an activity that they believe patients can do *RTWC* formulates solutions with patient *RTWC* models target behaviour a number of times, then asks patient to do the same and gives comments, emphasizing what has been done well

		behaviour various times, discuss the experience, and provide feedback		
Ability to engage with RTWC via helpline if they are having problems post discharge	Planning coping responses (TSR)	Prompting patients to list potential barriers and ways to overcome these	Identification of barriers and practice coping response	*RTWC* formulates solutions with patient to overcome any barriers they might experience in using the helpline
adhere to their postoperative rehabilitation plan attend/travel to rehabilitation if required	Planning coping responses (TSR) Facilitation (SCT)	Prompting patients to list potential barriers and ways to overcome these Creating an environment that makes the action easier or reduces barriers to action	Identification of difficult situations and practice of coping response Requires identification and removal of barriers	*RTWC* formulates solutions with patient *RTWC* asks patient the optimum arrangements for any rehabilitation they require and liaises with outpatient therapy teams
ATTITUDES, BELIEFS, EXPECTATIONS	**Methods**	**Definition**	**Parameters**	**Application**
Believes that completing an occupational checklist will facilitate RTW	Information about others approval	Providing information about what others think about the persons behaviour	Positive expectations available in the environment	*Outpatient clinic staff* inform patient that the surgeon will approve of them completing the checklist
Is willing to take responsibility for surgical decision	Motivational interviewing	Explore persons reasons for change within atmosphere of acceptance	Supportive relationship between client and professional	*Surgeon supports* autonomy of patient and offers choices about surgery where possible
Has realistic expectation of RTW outcome following surgery	Individualisation	Providing opportunities for learners to have personal questions answered	Personal communication that responds to a learner's needs	*Surgeon* advises individual patient as to the likely outcome of RTW following surgery according to the patient's characteristics and work demands
Believes that having a good understanding about recovery and RTW through RTW	Persuasive communication	Guiding individual toward adoption of	Messages need to be relevant and not too	HOT – especially *surgeon, outpatient clinic staff, RTWC* all present positive attitude to use of RTW workbook

workbook is likely to lead to a positive RTW outcome	Repeated exposure	action by using arguments and other means Making a stimulus repeatedly accessible to the individuals sensory receptors	discrepant to beliefs of individual	*All members of the team* consistently refer to intervention. Posters on ward?
Believes that bringing the RTW workbook to each hospital appointment is likely to facilitate a positive RTW outcome Believes that them discussing the RTW workbook at each hospital appointment is likely to facilitate a positive RTW outcome	Persuasive communication Anticipated regret	Guiding individual toward adoption of action by using arguments and other means Stimulate people to focus on their feelings after unintended risky behaviour	Messages need to be relevant and not too discrepant to beliefs of individual Stimulation of imagery; assumes a positive intention to avoid the risky behaviour	HOT – especially *surgeon, outpatient clinic staff, RTWC* refer to example of Red Book given to new parents as an example of similar approach in healthcare, and importance of good communication *Outpatient clinic staff, surgeon, RTWC* asks individual to imagine what might happen if they did not bring the RTW workbook to each appointment
Expects that completing the sections of the workbook that will help them understand the demands of their work and set an approximate RTW date…..with their employer* if required is likely to lead to a positive RTW outcome	Framing Modelling	Using gain-framed messages emphasizing the advantages of performing the healthy behaviour – Or loss-framed messages Providing an appropriate model	Requires high self-efficacy expectations Identification with the model	*Outpatient clinic staff, surgeon, RTWC* and the *RTW workbook* emphasise the advantages of completing the workbook *Outpatient clinic staff, surgeon, RTWC* and the *RTW workbook* provide examples – coping models
Believes that identifying barriers/facilitators and developing a RTW plan will aid their own safe and appropriate RTW	Modelling Framing	Providing an appropriate model Using gain-framed messages	Identification with the model Requires high self-	*Outpatient clinic staff, surgeon, RTWC* and the *RTW workbook* provide examples – coping models *Outpatient clinic staff, surgeon, RTWC and the RTW*

		emphasizing the advantages of performing the healthy behaviour – Or loss-framed messages	efficacy expectations	*workbook* emphasise the advantages of completing the workbook
Believes that engaging with the RTWC and developing a RTW plan will lead to a positive RTW outcome	Individualisation Elaboration	Providing opportunities for learners to have personal questions answered Stimulating the learner to add meaning to information that is processed	Personal communication that responds to a learner's needs Messages that are personally relevant	*RTWC* advises and supports individual patient with their RTW plan according to their individual characteristics and work demands *RTWC* discusses the RTW plan with the individual patient
Believes that providing their employer with written information about their forthcoming surgery and RTW will facilitate their RTW.	Consciousness raising	Providing information about causes, consequences, alternatives	Can use feedback and confrontation, but raising awareness must be quickly followed by increase in self-efficacy	Key people in HOT e.g. *surgeon, outpatient clinic staff, RTWC, and workbook* provide patient with feedback from Phase 1 of the study where employers stated they would like more information about surgery and recovery to help employees RTW
Believes that meeting with their employer informing their employer* to discuss their recovery and RTW plan will facilitate their RTW.	Belief selection (TPB, RAA)	Using messages designed to strengthen positive beliefs, weaken negative beliefs and introduce new beliefs	Requires investigation of the individual's current beliefs	*RTWC* explores patient's beliefs when engaging with patient
Believes that communicating with their employer* regarding surgical outcome and progress will lead to a positive RTW outcome	Self re-evaluation	Encouraging combining both cognitive and affective assessments of one's self-image with and without	Needs stimulation of both cognitive and affective assessments of one's self-image	*RTWC* encourages patient to compare his or her image as a person who does/does not communicate with their employer

		required behaviour		
Believes that revising the RTW plan following surgery will provide a more positive RTW experience	Modelling Framing	Providing an appropriate model Using gain-framed messages emphasizing the advantages of performing the healthy behaviour – Or loss-framed messages	Identification with the model Requires high self-efficacy expectations	*RTWC* and workbook/website provides examples of how patients have revised RTW plans following surgery
Believes that engaging with the RTWC via the RTW helpline/answering service will potentially alleviate any RTW problems	Modelling	Providing an appropriate model	Identification with the model	*Workbook/website* provides examples of how patients have contacted the RTWC via the helpline post-surgery
Believes that adhering to their postoperative rehabilitation plan is important for their recovery/RTW	Persuasive communication	Guiding individuals toward the adoption of an idea by using arguments or other means	Messages need to be relevant and not too discrepant from beliefs of individual	RTWC RTW workbook and website
PERCEIVED NORMS	**Methods**	**Definition**	**Parameters**	**Application**
Recognises that nowadays patients are being encouraged to take an active part in their care	Anticipated regret	Stimulate people to focus on their feelings after unintended risky behaviour	Stimulation of imagery; assumes a positive intention to avoid the risky behaviour	*Outpatient clinic staff, surgeon, RTWC* asks individual to imagine how they would feel/what might happen if they did not make an informed decision about surgery
Recognises that RTW is now considered a health outcome and that this is a good thing	Consciousness raising	Providing information about causes, consequences, alternatives	Can use feedback and confrontation, but raising awareness must be quickly followed by increase in self-efficacy	Information in *RTW workbook, website* and *members of HOT* consistent in expressing their belief in work as a health outcome Evidence about relationship between work and good health in *RTW workbook*
Perceives that it is usual for patients to make an informed decision about surgery with respect to their work	Shifting perspectives (TSD)	Encourage taking the perspective of the other	Initiation from the perspective of the learner; needs imaginary competence	HOT enable patients to compare the potential result for patients who do, versus those who don't make informed decision

Recognises that patients undergoing surgery acquaint themselves with key information about recovery and RTW provided by the hospital orthopaedic team Recognises that discussing the RTW workbook with hospital staff is best practice	Information about others' approval Persuasive communication	Providing information about what others think about the persons behaviour Guiding individuals toward the adoption of an idea by using arguments or other means	Positive expectations are available in the environment Messages need to be relevant and not too discrepant from beliefs of individual	Patients are given information in their RTW workbook, and staff express approval of patients who acquaint themselves with key information about recovery and RTW provided by the hospital orthopaedic team RTW workbook and website states that content informed by patients and other stakeholders and current evidence
Recognises that employers* are key stakeholders in RTW and involving them at an early stage can facilitate RTW	Consciousness raising	Providing information about causes, consequences, alternatives	Can use feedback and confrontation, but raising awareness must be quickly followed by increase in self-efficacy	Information in *RTW workbook, website* and *members of HOT* consistent in expressing their belief in involving employers at an early stage Evidence about early involvement of employers in *RTW workbook*
Recognises that the ideal RTW process relies on coordination and joint planning between healthcare, the patient and their employer	Elaboration	Stimulating the learner to add information that is processed	Messages that are personally relevant, easily understandable	*RTWC and HOT* (e.g. pre-assessment education) encourage discussion of communication pathways
Recognises that employers do not necessarily know about this type of surgery and how best to facilitate RTW	Shifting perspectives (TSD)	Encourage taking the perspective of the other	Initiation from the perspective of the learner; needs imaginary competence	HOT help patient to see RTW from the employer's perspective – what they know and need
Recognises that communication with their employer* is key to a successful RTW outcome	Modelling	Providing an appropriate model	Identification with the model	Information in *RTW workbook, website* and *members of HOT* consistent in expressing their belief in communication with employer
Recognises that RTW is an ongoing process that needs to monitored	Elaboration	Stimulating the learner to add information that is processed	Messages that are personally relevant, easily understandable	*RTWC and HOT* (e.g. preassessment education) encourage discussion of RTW monitoring

Section 3: Staff methods and applications

Behaviour to be targeted: Hospital Orthopaedic Teams to deliver work-focused support and advice

KNOWLEDGE AND AWARENESS

Methods	Definitions	Parameters	Applications
Discussion *(Elaboration Likelihood Model)*	Stimulating the learner to add meaning to the information that is processed	Listening to the learner to ensure that the correct schemas are activated	OPAL staff training prior to implementation. Ideally group, face-to-face, interactive
Elaboration *(Theories of Information Processing; Elaboration Likelihood Model)* Coherence and imagery *(Theories of Information Processing)*	Stimulating the learner to add meaning to the information that is processed	Messages personally relevant, easily understandable	Each member of HOT has own OPAL study pack containing this information: Study pack uses chunking, advance organisers and imagery methods to aid learning. I.e. sections of text have logical order and clearly related to each other using graphical representations Each work area has study pack available Computer-based version of training Study website Study newsletters
Individualisation/ tailoring *(Transtheoretical Model)*	Matching to participant characteristics, opportunities for personal/paced learning	Tailoring to participant, personal communication responds to learner's need, relevance	Staff training tailored to specific profession/role/need One-to-one training/support from OPAL team as required
Modelling *(Social Cognitive Theory; Theories of Learning)*	Providing an appropriate model	Identification with model Coping v mastery model	Coping models of staff 'tasks' used in training/study packs
Consciousness raising *(Health Belief Model)* Framing *(Protection Motivation Theory)*	Information about causes, and consequences of behaviour Emphasise pros and cons of behaviour	Raising awareness should be quickly followed by increase in self-efficacy Gain-frames more ready accepted	Staff training – consequences of providing RTW adivce/support
Providing cues *(Theories of*	Assuring same cues are present at time	Work best when people select and	Staff at each research study site to suggest cues to

Information Processing)	of learning and time of retrieval	provide own cues	action e.g. Posters on ward/in clinic with photos of RTWC, OPAL champions and their contact details e.g. OPAL study posters and pens

SKILLS AND SELF-EFFICACY

Methods	Definitions	Parameters	Applications
Verbal persuasion *(Social Cognitive Theory)*	Use messages that suggest the participants possess certain capabilities	Credible source	Research team explain through training that they believe the HOT can do this; that OPAL study informed by stakeholders and evidence
Facilitation *(Social Cognitive Theory)*	Creating an environment that makes the action easier or reduces barriers	Required real changes in the environment	Staff training at optimal times/places/methods e.g. Posters on ward/in clinic with photos of RTWC, OPAL champions and their contact details e.g. Researchers and clinic team at each site establish easy/default methods of identifying RTW patients e.g. Templates to facilitate completion of study documentation e.g. ready supplies of study checklists, paperwork, pens e.g. allowing sufficient time for staff performance objectives to be met
Information about others' approval Social Comparison *(Theory of Planned Behaviour; Social Comparison Theory)*	Providing information about whether others will approve or disapprove of any proposed behaviour change Observation of other non-experts to evaluate one's own opinions and abilities	Positive expectations available in environment Upward comparison may help set better goals, downward may increase sense of self-efficacy	Staff training includes information on Phase 1 stakeholder interviews, and increasing focus on work and health Comparison with other HOTs Comparison with support for other health conditions Study newsletters with updates from each site
Feedback	Giving information as to the extent of	Feedback needs to be individual, specific	Regular contact maintained with HOT from OPAL team

Reinforcement *(Theories of Learning, Goal Setting, Social Cognitive Theory)*	impact of performance Lining behaviour to consequence that increases rate of behaviour	and follow the behaviour in time As above	Study newsletters with updates from each site with positive feedback Praise from OPAL team for staff engagement with OPAL study
Guided practice Modelling *(Social Cognitive Theory)*	Prompting individuals to rehearse and repeat behaviour various times, discuss experience and provide feedback Providing an appropriate model	Requires supervision by experienced person Identification with model Coping v mastery model	OPAL team members model/role play/provide examples of target behaviours then ask staff to do the same and give feedback emphasising what has been done well
Planning coping responses *(Attribution Theory; Theories of Self-Regulation)*	Prompting participants to list potential barriers and ways to overcome these	Identification of high-risk situations and practice of coping responses	OPAL team and HOT members discuss and problem-solve potential problems as part of training, e.g. patient avoids contact with RTWC, fails to bring RTW workbook

ATTITUDES, BELIEFS, EXPECTATIONS

Methods	Definitions	Parameters	Applications
Self re-evaluation *(Trans-Theoretical Model)*	Encourage combining both cognitive and affective assessments of one's self-image with and without an 'unhealthy' behaviour	Raising awareness must be quickly followed by increase in problem-solving ability and self-efficacy	Training encourages staff to focus on what they think and how they feel about being a HCP that supports patients in returning to work
Shifting perspective *(Theories of Stigma and Discrimination)*	Encouraging the perspective of another	Initiation from the perspective of the learner; needs imaginary competence	Encouraging staff to view a change in their clinical practice from the perspective of the patient returning to work and their employer, using examples from stakeholder interviews and cohort study in Phase 1 of OPAL study as part of training programme
Persuasive communication *(Diffusion of Innovations Theory)*	Guiding people towards the adoption of an idea or action by using arguments or other means	Messages need to be relevant and not too discrepant from the beliefs of the individual	Persuading staff that the delivery of work-focused advice and support at an early stage in the patients RTW process is possible
Belief selection *(Theory of Planned Behaviour)*	Using messages to strengthen positive beliefs, weaken negative beliefs and introduce new beliefs	Requires investigation of current beliefs of individual before intervening	Using evidence-based data on RTW to change staff beliefs about the proportion of working patients undergoing surgery

PERCEIVED NORMS

Method	Definition	Parameters	Applications

Self re-evaluation *(Trans-Theoretical Model)* Belief selection Shifting perspective Persuasive communication	See above examples	See above examples	Training to focus on encouraging staff to see it as good practice/in accordance with new thinking on work and health/feasible: For HOTS to provide early support and advice to patients For patients to RTW following surgery That improved advice and support will facilitate timely and successful RTW That these patients often receive little support elsewhere That the number of working patients undergoing surgery is likely to increase

Notes: Training format; Ideally group, face to face, interactive but backed up by online presentation, website and information pack
Bespoke components for different professions/roles/needs backed up by one-to-one support from OPAL team
Training content to include all or some of following

- OPAL study/team overview
- Summary of Phase 1 findings
- Overview of current evidence/guidance on work and health/RTW
- Overview of roles of different members of HOT in delivering OPAL
- Study documentation
- Use of the fit note
- Examples of work modifications, barriers and solutions, RTW plans
- Trouble-shooting, problem-solving

Appendix 7: Supporting information for the Delphi consensus process

Section 1: Delphi consensus participants (n=66)

Table 69: Details of stakeholders invited to participate in the Delphi consensus process

Surgeons n=13	
Role	**Hospital**
Surgeon	Middlesbrough
Surgeon	Exeter
Surgeon	Wrightington
Surgeon	Norwich
Surgeon	Exeter
Surgeon	Middlesbrough
Surgeon	Bristol
Surgeon	Norwich
Surgeon	Edinburgh
Surgeon	Aintree
Surgeon	West Suffolk
Surgeon	Golden Jubilee
Surgeon	Northumbria
Allied Health Professionals n=16	
Role	**Hospital**
Research Physiotherapist	Edinburgh
Physiotherapist	Middlesbrough
Research Physiotherapist	Norwich
Physiotherapist	Bournemouth
Physiotherapist	Middlesbrough
Occupational therapist	Scunthorpe
Occupational therapist	Derby
Occupational therapist	Golden Jubilee National Hospital
Occupational therapist	Darlington
Occupational therapist	Burton
Occupational therapist	Northwich
Occupational therapist	Lancashire
Occupational therapist	St Helens
Nurse / Research nurse	Edinburgh
Nurse Practitioner	Middlesbrough
Joint replacement Nurse	South Tees
GPs n=10	
Role	**Hospital**
GP	South Tees
GP	Edinburgh

GP	Edinburgh
GP	Northumberland
GP	Teesside
Academic GP	Liverpool
Occupational Health Physician	Manchester
GP	Leicestershire
RCGP lead for chronic pain (currently in clinical Research)	
GP	Nottingham
Employers n=13	
Role / Occupation	**Based**
Briar Chemicals	Norwich
Babcock International	Plymouth
East of England Coop	East of England
Centre Parcs Sherwood	Nottingham
Physio	Nottingham
HR Manger	Schaeffler
-	Schaeffler
CMO / Occupational Health Consultant	National Areospace
-	Rolls Royce
Head of Safety, Health and Quality	Finning
OH Manager	Toyota UK
Physiotherapist, Occupational Health and Training Team	Rhondda Cynon Taf Council
Patients n=14	
Patient lead NJR PLG	-
Patient	-
Patient / Ambassador for Global alliance for MSK Health of the bone and joint decade	-
Patient	-
Patient	-
Patient	-
Service Manager for Arthritis Care	-
Patient	-
Patient	-
Patient	-
Patient	-
Patient	-
Patient	-
Patient	-

Section 2: Delphi Round 1

See OPAL Delphi questionnaires.

Table 70: Responses to Section 1 of Round 1 Delphi

Question	n	Strongly Agree	SA(%)	Agree	A(%)	Disagree	D(%)	Strongly Disagree	SD(%)	Don't Know	DK(%)	Combined SA/A (%)	Combined SD/D (%)
Q3	43	33	76.7	9	20.9	1	2.3	0	0.0	0	0.0	97.7	2.3
Q4	43	23	53.5	15	34.9	2	4.7	2	4.7	1	2.3	88.4	9.4
Q5	43	33	76.7	8	18.6	2	4.7	0	0.0	0	0.0	95.3	4.7
Q6	43	16	37.2	17	39.5	8	18.6	0	0.0	2	4.7	76.7	18.6
Q7	43	11	25.6	17	39.5	11	25.6	1	2.3	3	7.0	65.1	27.9
Q8	43	13	30.2	18	41.9	7	16.3	1	2.3	4	9.3	72.1	18.6
Q9	43	33	76.7	10	23.3	0	0.0	0	0.0	0	0.0	100.0	0.0
Q10	43	25	58.1	16	37.2	2	4.7	0	0.0	0	0.0	95.3	4.7
Q11	43	7	16.3	28	65.1	6	14.0	0	0.0	2	4.7	81.4	14.0
Q12	43	27	62.8	14	32.6	2	4.7	0	0.0	0	0.0	95.3	4.7
Q13	43	24	55.8	19	44.2	0	0.0	0	0.0	0	0.0	100.0	0.0
Q14	43	20	46.5	21	48.8	1	2.3	0	0.0	1	2.3	95.3	2.3
Q15	43	31	72.1	11	25.6	0	0.0	0	0.0	1	2.3	97.7	0.0
Q16	43	13	30.2	22	51.2	4	9.3	1	2.3	3	7.0	81.4	11.6
Q17	43	14	32.6	19	44.2	8	18.6	1	2.3	1	2.3	76.7	20.9
Q18	43	29	67.4	12	27.9	1	2.3	0	0.0	1	2.3	95.3	2.3
Q19	43	12	27.9	26	60.5	3	7.0	1	2.3	1	2.3	88.4	9.3
Q20	43	14	32.6	24	55.8	4	9.3	1	2.3	0	0.0	88.4	11.6
Q21	43	18	41.9	20	46.5	3	7.0	0	0.0	2	4.7	88.4	7.0
Q22	43	7	16.3	23	53.5	8	18.6	1	2.3	4	9.3	69.8	20.9
Q23	43	14	32.6	26	60.5	2	4.7	0	0.0	1	2.3	93.0	4.7
Q24	43	11	25.6	24	55.8	4	9.3	0	0.0	4	9.3	81.4	9.3
Q25	43	10	23.3	19	44.2	9	20.9	2	4.7	3	7.0	67.4	25.6
Q26	43	10	23.3	19	44.2	11	25.6	1	2.3	2	4.7	67.4	27.9
Q27	43	10	23.3	26	60.5	4	9.3	0	0.0	3	7.0	83.7	9.3
Q28	43	13	30.2	23	53.5	5	11.6	1	2.3	1	2.3	83.7	13.9
Q29	43	20	46.5	18	41.9	4	9.3	1	2.3	0	0.0	88.4	11.6
Q30	43	15	34.9	17	39.5	10	23.3	0	0.0	1	2.3	74.4	23.3
Q31	43	17	39.5	18	41.9	7	16.3	0	0.0	1	2.3	81.4	16.3
Q32	43	8	18.6	26	60.5	6	14.0	0	0.0	3	7.0	79.1	14.0
Q33	43	8	18.6	21	48.8	10	23.3	0	0.0	4	9.3	67.4	23.3
Q34	43	11	25.6	15	34.9	12	27.9	0	0.0	5	11.6	60.5	27.9

Table 71: Responses to Section 1 of Round 1 Delphi ordered based on consensus (% respondents answering strongly agree or agree), second level based on % of strongly agree respondents

Question	n	Strongly Agree	SA(%)	Agree	A(%)	Disagree	D(%)	Strongly Disagree	SD(%)	Don't Know	DK(%)	Combined SA/A (%)	Combined SD/D (%)
Q9	43	33	76.7	10	23.3	0	0.0	0	0.0	0	0.0	100.0	0.0
Q13	43	24	55.8	19	44.2	0	0.0	0	0.0	0	0.0	100.0	0.0
Q3	43	33	76.7	9	20.9	1	2.3	0	0.0	0	0.0	97.7	2.3
Q15	43	31	72.1	11	25.6	0	0.0	0	0.0	1	2.3	97.7	0.0
Q5	43	33	76.7	8	18.6	2	4.7	0	0.0	0	0.0	95.3	4.7
Q18	43	29	67.4	12	27.9	1	2.3	0	0.0	1	2.3	95.3	2.3
Q12	43	27	62.8	14	32.6	2	4.7	0	0.0	0	0.0	95.3	4.7
Q10	43	25	58.1	16	37.2	2	4.7	0	0.0	0	0.0	95.3	4.7
Q14	43	20	46.5	21	48.8	1	2.3	0	0.0	1	2.3	95.3	2.3
Q23	43	14	32.6	26	60.5	2	4.7	0	0.0	1	2.3	93.0	4.7
Q4	43	23	53.5	15	34.9	2	4.7	2	4.7	1	2.3	88.4	9.3
Q29	43	20	46.5	18	41.9	4	9.3	1	2.3	0	0.0	88.4	11.6
Q21	43	18	41.9	20	46.5	3	7.0	0	0.0	2	4.7	88.4	7.0
Q20	43	14	32.6	24	55.8	4	9.3	1	2.3	0	0.0	88.4	11.6
Q19	43	12	27.9	26	60.5	3	7.0	1	2.3	1	2.3	88.4	9.3
Q28	43	13	30.2	23	53.5	5	11.6	1	2.3	1	2.3	83.7	14.0
Q27	43	10	23.3	26	60.5	4	9.3	0	0.0	3	7.0	83.7	9.3
Q31	43	17	39.5	18	41.9	7	16.3	0	0.0	1	2.3	81.4	16.3
Q16	43	13	30.2	22	51.2	4	9.3	1	2.3	3	7.0	81.4	11.6
Q24	43	11	25.6	24	55.8	4	9.3	0	0.0	4	9.3	81.4	9.3
Q11	43	7	16.3	28	65.1	6	14.0	0	0.0	2	4.7	81.4	14.0
Q32	43	8	18.6	26	60.5	6	14.0	0	0	3	7.0	79.1	14.0
Q6	43	16	37.2	17	39.5	8	18.6	0	0.0	2	4.7	76.7	18.6
Q17	43	14	32.6	19	44.2	8	18.6	1	2.3	1	2.3	76.7	20.9
Q30	43	15	34.9	17	39.5	10	23.3	0	0.0	1	2.3	74.4	23.3
Q8	43	13	30.2	18	41.9	7	16.3	1	2.3	4	9.3	72.1	18.6
Q22	43	7	16.3	23	53.5	8	18.6	1	2.3	4	9.3	69.8	20.9
Q25	43	10	23.3	19	44.2	9	20.9	2	4.7	3	7.0	67.4	25.6
Q26	43	10	23.3	19	44.2	11	25.6	1	2.3	2	4.7	67.4	27.9
Q33	43	8	18.6	21	48.8	10	23.3	0	0	4	9.3	67.4	23.3
Q7	43	11	25.6	17	39.5	11	25.6	1	2.3	3	7.0	65.1	27.9
Q34	43	11	25.6	15	34.9	12	27.9	0	0	5	11.6	60.5	27.9

Table 72: Statements for Section 1 of Round 1 Delphi ordered based on consensus (% respondents answering strongly agree or agree), second level based on % of strongly agree respondents

Question descriptions (Ordered by % of respondents that strongly agreed or agreed)
Q9. Information about exercises and rehabilitation following surgery
Q13. Information about returning to driving
Q3. A broad overview written for all stakeholders, of what to expect following surgery (rates and timing of expected recovery)
Q15. Information about managing pain, types of analgesia and side effects
Q5. Information about post-operative precautions, restrictions and activities to avoid following surgery
Q18. Information about symptom management in relation to return to work and specific occupations e.g. expected levels of fatigue, pain, swelling
Q12. Tips and tricks to help the patient manage around their home with day to day activities immediately following surgery
Q10. Information regarding post-operative complications and their management
Q14. Signposting to DVLA guidance
Q23. Information for the patient about who to ask if they are having a problem returning to work
Q4. Information about expected level of function at different time - points following surgery
Q29. Advices about adaptions to working patterns to assist return including the use of phased returns, modified hours and altered work schedules
Q21. Information and resources to support self-advocacy and empowerment
Q20. Information about when it might be appropriate for patients and employers to access occupational health services
Q19. Information for patients and employers about how to access occupational health services
Q28. A list of potential workplace modifications, aids and adjustments that could be used to assist with return to work, with examples
Q27. Information for the patients about how to ask for help at work from their employer and colleagues
Q31. Guidance on how to set an appropriate provisional return to work date based on the date and type of surgery
Q16. Guidance for orthopaedic care teams and G.Ps on how to use and prescribe a fit note
Q24. Signposts to national and local support services e.g. Fit4Work, Citizens advices, ACAS
Q11. Information about how having surgery may impact on social relationships
Q32. Advice about how psychosocial and emotional factor influence return to work
Q6. Information about how long the hip and knee replacement prostheses will last
Q17. Examples of the correct use of fit notes
Q30. A list of potential return to work barriers for patients and employers to consider
Q8. Information about managing more than one joint replacement in close succession
Q22. Information about how to access resilience training courses and other resources aimed at helping people cope better during challenging times. Courses such as these improve the patient confidence in their ability to bounce back from the many pressures and adversities they encounter in today's workplace
Q25. Links to national, workplace legislation and guidance e.g. information on workers rights, employment law
Q26. Testimonials and case studies of patients who have successfully returned to work after surgery
Q33. Guidance and frameworks to facilitate meetings to discuss sickness and return to work between the patient and their employer
Q7. Information about revision (redo) surgery
Q34. Guidance for employers about how to perform a work capacity assessment

Table 73: Sub-analysis and actions for 6 statements that failed to reached overall consensus from section 1 of Round 1 of Delphi

Question	Surgeon (n=8)			AHP (n=11)			GP (n=6)			Employer (n=4)			Patient (n=14)					
	SA/A (%)	SD/D (%)	DK (%)	SA/A (%)	SD/D (%)	DK (%)	SA/A (%)	SD/D (%)	DK (%)	SA/A (%)	SD/D (%)	DK (%)	SA/A (%)	SD/D (%)	DK (%)	Total groups SA/A	Total groups SD/D	Action
Q22	50	38	13	82	18	0	66	17	17	75	0	25	71	21	7	3 of 5	0 of 5	Round 2
Q25	50	38	13	73	9	18	66	33	0	100	0	0	64	36	0	2 of 5	0 of 5	Round 2
Q26	63	38	0	82	9	9	66	33	0	50	50	0	64	29	7	1 of 5	0 of 5	Discarded
Q33	38	63	0	73	9	18	83	17	0	75	25	0	71	14	14	4 of 5	0 of 5	Round 2
Q7	50	50	0	64	27	9	50	33	17	75	0	25	79	21	0	2 of 5	0 of 5	Round 2
Q34	25	75	0	45	27	27	83	0	17	50	25	25	86	14	0	2 of 5	1 of 5	Round 2

Table 74: Additional ‘Free comments’ from Section 1 of Round 1 Delphi

1	Some of the questions I may answer differently depending on the content and angle that the information is given. I feel adaptations at work have far more effect of disabling people and causing friction and ill feeling more than help in the long run. Phased return and temporarily modifying work would be much more successful in the long term. I feel questions/information around "expected" time frames can be tricky for generic leaflets where so many variable factors exist and can again cause much pressure and friction with employers if not met
2	Qu 30 has wrong options
3	No mention thus far regarding type of work. What is reasonable and what is out of the question.
4	I've found social media patient forums to be particularly useful.
5	Crucial for patients to be given access to information about their condition and the range of healthcare treatments/options, and self-management options, available to them (shared decision making).
6	Specific co-worker contact (volunteer) or case worker in larger organisation can help out with 'tunnel vision' situations.
7	Surely the aim is to help employees & employers find a common ground. This section of points should be sufficient to facilitate this.
8	All of my answers refer to NHS practitioners. Where I work, I have access to our own occupational health practitioners who were contacted and appropriate help and guidance was given from this source.
9	All patients will vary in the recovery time due to healing process and managing pain. Physiotherapist sessions in groups help give an easy way to gudge progress. I found this most useful as I was slow at first.
10	It would need to be clear that the adjustments, adaptations and aids would need to be specific to the individual. Information would need to reflect that there are many variations in the services offered by both NHS and employers.

Table 75: Responses to Section 2 of Round 1 Delphi (IMPORTANT OUTCOME)

Question	n	Strongly Agree	SA(%)	Agree	A(%)	Disagree	D(%)	Strongly Disagree	SD(%)	Don't Know	DK(%)	Combined SA/A (%)	Combined SD/D(%)
Q36	43	18	41.9	19	44.2	1	2.3	0	0.0	5	11.6	86.0	2.3
Q37	43	17	39.5	24	55.8	0	0.0	0	0.0	2	4.7	95.3	0.0
Q38	43	15	34.9	17	39.5	9	20.9	0	0.0	2	4.7	74.4	20.9
Q39	43	22	51.2	20	46.5	0	0.0	0	0.0	1	2.3	97.7	0.0
Q40	43	15	34.9	21	48.8	4	9.3	0	0.0	3	7.0	83.7	9.3
Q41	43	13	30.2	22	51.2	1	2.3	2	4.7	5	11.6	81.4	7.0
Q42	43	14	32.6	24	55.8	2	4.7	0	0.0	3	7.0	88.4	4.7
Q43	43	9	20.9	18	41.9	13	30.2	0	0.0	3	7.0	62.8	30.2
Q44	43	9	20.9	21	48.8	7	16.3	1	2.3	5	11.6	69.8	18.6
Q45	43	13	30.2	25	58.1	5	11.6	0	0.0	0	0.0	88.4	11.6
Q46	43	13	30.2	22	51.2	6	14.0	0	0.0	2	4.7	81.4	14.0
Q47	43	13	30.2	23	53.5	3	7.0	0	0.0	4	9.3	83.7	7.0
Q48	43	14	32.6	22	51.2	6	14.0	0	0.0	1	2.3	83.7	14.0
Q49	43	8	18.6	23	53.5	10	23.3	0	0.0	2	4.7	72.1	23.3
Q50	43	9	20.9	16	37.2	15	34.9	0	0.0	3	7.0	58.1	34.9
Q51	43	16	37.2	20	46.5	3	7.0	1	2.3	3	7.0	83.7	9.3
Q52	43	22	51.2	18	41.9	2	4.7	0	0.0	1	2.3	93.0	4.7
Q53	43	7	16.3	21	48.8	10	23.3	2	4.7	3	7.0	65.1	27.9
Q54	43	8	18.6	28	65.1	6	14.0	1	2.3	0	0.0	83.7	16.3
Q55	43	3	7.0	18	41.9	19	44.2	0	0.0	3	7.0	48.8	44.2
Q56	42	12	28.6	22	52.4	5	11.9	0	0.0	3	7.1	81.0	11.9
Q57	42	10	23.8	22	52.4	5	11.9	0	0.0	5	11.9	76.2	11.9
Q58	42	11	26.2	22	52.4	5	11.9	0	0.0	4	9.5	78.6	11.9
Q59	42	7	16.7	18	42.9	11	26.2	2	4.8	4	9.5	59.5	31.0
Q60	42	8	19.0	19	45.2	8	19.0	3	7.1	4	9.5	64.3	26.2
Q61	42	8	19.0	21	50.0	3	7.1	1	2.4	9	21.4	69.0	9.5
Q62	42	11	26.2	22	52.4	3	7.1	0	0.0	6	14.3	78.6	7.1
Q63	42	6	14.3	25	59.5	5	11.9	1	2.4	5	11.9	73.8	14.3
Q64	42	9	21.4	27	64.3	3	7.1	0	0.0	3	7.1	85.7	7.1
Q65	41	12	29.3	22	53.7	5	12.2	0	0.0	2	4.9	82.9	12.2
Q66	41	9	22.0	21	51.2	3	7.3	0	0.0	8	19.5	73.2	7.3
Q67	41	13	31.7	21	51.2	3	7.3	0	0.0	4	9.8	82.9	7.3

Table 76: Responses to Section 2 of Round 1 Delphi (DELIVERABLE OUTCOME)

Question	n	Strongly Agree	SA(%)	Agree	A(%)	Disagree	D(%)	Strongly Disagree	SD(%)	Don't Know	DK(%)	Unable to answer	Combined SA/A (%)	Combined SD/D(%)
Q36	39	10	25.6	19	48.7	5	12.8	0	0.0	5	12.8	4	74.4	12.8
Q37	38	11	28.9	16	42.1	5	13.2	0	0.0	6	15.8	5	71.1	13.2
Q38	37	11	29.7	12	32.4	9	24.3	0	0.0	5	13.5	6	62.2	24.3
Q39	39	8	20.5	15	38.5	6	15.4	2	5.1	8	20.5	4	59.0	20.5
Q40	38	9	23.7	21	55.3	4	10.5	0	0.0	4	10.5	5	78.9	10.5
Q41	37	4	10.8	9	24.3	10	27.0	3	8.1	11	29.7	6	35.1	35.1
Q42	37	4	10.8	22	59.5	3	8.1	0	0.0	8	21.6	6	70.3	8.1
Q43	37	3	8.1	7	18.9	18	48.6	0	0.0	9	24.3	6	27.0	48.6
Q44	40	7	17.5	24	60.0	4	10.0	0	0.0	5	12.5	3	77.5	10.0
Q45	38	10	26.3	21	55.3	5	13.2	0	0.0	2	5.3	5	81.6	13.2
Q46	39	5	12.8	14	35.9	9	23.1	4	10.3	7	17.9	4	48.7	33.3
Q47	38	7	18.4	16	42.1	8	21.1	3	7.9	4	10.5	5	60.5	28.9
Q48	38	9	23.7	15	39.5	7	18.4	5	13.2	2	5.3	5	63.2	31.6
Q49	40	4	10.0	13	32.5	13	32.5	3	7.5	7	17.5	3	42.5	40.0
Q50	38	6	15.8	12	31.6	15	39.5	0	0.0	5	13.2	5	47.4	39.5
Q51	39	8	20.5	23	59.0	3	7.7	3	7.7	2	5.1	4	79.5	15.4
Q52	39	14	35.9	18	46.2	2	5.1	0	0.0	5	12.8	4	82.1	5.1
Q53	38	5	13.2	11	28.9	10	26.3	4	10.5	8	21.1	5	42.1	36.8
Q54	40	4	10.0	17	42.5	8	20.0	2	5.0	9	22.5	3	52.5	25.0
Q55	36	0	0.0	12	33.3	16	44.4	1	2.8	7	19.4	7	33.3	47.2
Q56	38	7	18.4	18	47.4	2	5.3	2	5.3	9	23.7	4	65.8	10.5
Q57	40	7	17.5	22	55.0	4	10.0	0	0.0	7	17.5	2	72.5	10.0
Q58	41	9	22.0	19	46.3	6	14.6	0	0.0	7	17.1	1	68.3	14.6
Q59	39	7	17.9	22	56.4	5	12.8	1	2.6	4	10.3	3	74.4	15.4
Q60	35	4	11.4	13	37.1	8	22.9	3	8.6	7	20.0	7	48.6	31.4
Q61	38	5	13.2	16	42.1	4	10.5	1	2.6	12	31.6	4	55.3	13.2
Q62	38	8	21.1	22	57.9	1	2.6	0	0.0	7	18.4	4	78.9	2.6
Q63	39	2	5.1	18	46.2	7	17.9	0	0.0	12	30.8	3	51.3	17.9
Q64	39	6	15.4	25	64.1	2	5.1	0	0.0	6	15.4	3	79.5	5.1
Q65	39	4	10.3	17	43.6	10	25.6	1	2.6	7	17.9	2	53.8	28.2
Q66	38	7	18.4	17	44.7	3	7.9	0	0.0	11	28.9	3	63.2	7.9
Q67	38	9	23.7	16	42.1	4	10.5	1	2.6	8	21.1	3	65.8	13.2

Table 77: Summary of agreement for both importance and deliverable outcome in Section 2 of Round 1 Delphi ordered based on level of consensus: first level % respondents answering strongly agree or agree to IMPORTANT question; second level based on % respondents answering strongly agree or agree to DELIVERABLE question.

	IMPORTANT	DELIVERABLE	
Question	Combined SA/A (%)	Combined SA/A (%)	OUTCOME
Q39	97.7	59.0	Subgroup analysis
Q37	95.3	71.1	Consensus reached
Q52	93.0	82.1	Consensus reached
Q45	88.4	81.6	Consensus reached
Q42	88.4	70.3	Consensus reached
Q36	86.0	74.4	Consensus reached
Q64	85.7	79.5	Consensus reached
Q51	83.7	79.5	Consensus reached
Q48	83.7	63.2	Subgroup analysis
Q54	83.7	52.5	Subgroup analysis
Q40	83.7	78.9	Consensus reached
Q47	83.7	60.5	Subgroup analysis
Q65	82.9	53.8	Subgroup analysis
Q67	82.9	65.8	Subgroup analysis
Q46	81.4	48.7	Subgroup analysis
Q41	81.4	35.1	Subgroup analysis
Q56	81.0	65.8	Subgroup analysis
Q62	78.6	78.9	Consensus reached
Q58	78.6	68.3	Subgroup analysis
Q57	76.2	72.5	Consensus reached
Q38	74.4	62.2	Subgroup analysis
Q63	73.8	51.3	Subgroup analysis
Q66	73.2	63.2	Subgroup analysis
Q49	72.1	42.5	Subgroup analysis
Q44	69.8	77.5	Subgroup analysis
Q61	69.0	55.3	Discarded
Q53	65.1	42.1	Discarded
Q60	64.3	48.6	Discarded
Q43	62.8	27.0	Discarded
Q59	59.5	74.4	Discarded
Q50	58.1	47.4	Discarded
Q55	48.8	33.3	Discarded

Table 78: Statements for Section 2 of Round 1 Delphi group according to whether consensus was reached for both IMPORTANT AND DELIVERABLE outcome; one of the outcomes or none of the outcomes. With groups statements are ordered based on level of consensus: first level % respondents answering strongly agree or agree to IMPORTANT question; second level based on % respondents answering strongly agree or agree to DELIVERABLE question.

10 statements that reached consensus for both IMPORTANCE and DELIVERABILITY
Q37. A post-operative mechanism for the identification of patients that are not progressing toward return to work as planned
Q52. Guidance for health services defining 'best practice' for patients returning to work after hip and knee replacement surgery
Q45. Training for members of the hospital orthopaedic care team to increase awareness about return to work issues
Q42. Interaction between the healthcare team and patient by phone, email or 'on-line' so that members of the care team can monitor progress and help the patient use the advice and information provided
Q36. A mechanism for pre-operative identification of patients at 'high risk' of prolonged sickness absence following surgery
Q64. Guidance on when in the return to work process patients can safely be discharged back to primary care for continued management of their return to work
Q51. Routine pre-operative therapy assessment during which a return to work plan is developed between the patients and the hospital orthopaedic care team
Q40. A separate intervention for hip and knee replacement patients that are not progressing towards return to work as planned
Q62. A process by which work status can be included in referral information for all patients referred from primary care into secondary care for consideration of hip or knee replacement
Q57. Information from patients that have experienced the process of returning to work after hip or knee replacement within the pre-operative education process
14 statements reached consensus for IMPORTANCE but failed to reach consensus for DELIVERABILITY
Q39. The ability to 'step up' the level of care and provide additional help and support for patients identified as 'high risk' of prolonged sickness absence or those that are not progressing towards return to work as planned
Q48. A prescribed post-operative rehabilitation therapy program including assessment at regularly defined intervals following surgery
Q54. Specific pre-operative, pre-assessment and educational classes for 'return to work' patients to facilitate co-ordination of their care
Q47. Specific therapy services/classes to oversee the rehabilitation of all patients aiming to return to work after hip and knee replacement
Q65. A return to work plan that can be completed and agreed between the patient, their employer and relevant members of the healthcare orthopaedic care team
Q67. A screening checklist to help stratify work demands and provide a way of tailoring the expected time a patient will require to recover following their surgery before they return to work and the support they may need
Q46. Greater access, over and above the standard care, to therapy services for all patients aiming to return to work following surgery
Q41. A named 'return to work' team that are members of the hospital orthopaedic care team and are responsible for communicating with patients and actively monitoring their progress and return to work after surgery
Q56. The development of a local network for patients that have experienced the process of returning to work after hip or knee replacement to provide peer support and guidance
Q58. Links to national and local online forums for peer support
Q38. A standard pathway delivering the same level of care to all patients aiming to return to work following their surgery
Q63. The ability to document and share information between stakeholders about whether workplace interventions/ adaptions and changes to work schedules have been used
Q66. The ability for patients to document and share the outcomes of the return to work meetings and discussions with their employer and members of the hospital orthopaedic care team
Q49. Continued therapy involvement until the point at which the patient returns to work
2 statements reached consensus for DELIVERABILITY but failed to reach consensus for IMPORTANCE
Q44. The ability for patients to be highlighted within the hip/knee replacement pathway documentation e.g. 'Return to work patient' in order to increase awareness amongst members of the hospital orthopaedic team
Q59. The ability for copies of clinic letters to be sent to employers with patients consent
6 statements failed to reach consensus for either IMPORTANCE or DELIVERABILITY
Q61. The ability for the hospital orthopaedic care team to record information about the duration of and information provided in fit notes issued to individual patients
Q53. Consideration of patients' work schedules when listing for surgery
Q60. A mechanism by which employers, GPs and Surgeons could communicate directly with one another and share information about the care and progress of the patients (with the patient's consent)
Q43. A specific 'return to work' co-ordinator that liases with the employer, G.Ps and hospital services on behalf of the patient (with the patients consent)
Q50. A progress chart to document recovery that could be completed by the patient and relevant members of the hospital orthopaedics care team and shared with the employer
Q55. The ability for 'return to work' patients to be seen by their surgeon at additional or alternative post-operative time points to those offered routinely

Table 79: Sub-analysis and actions for 16 statements that failed to reached overall consensus from section 2 of Round 1 of Delphi

SUBGROUP ANALYSES			Surgeons	AHP	GPs	Employers	Patients	TOTAL	Outcome
Q39	97.7	59.0	Yes					1	Discarded
Q48	83.7	63.2	Yes		Yes	Yes		3	Round 2
Q54	83.7	52.5	Yes					1	Discarded
Q47	83.7	60.5	Yes		Yes			2	Round 2
Q65	82.9	53.8			Yes	Yes		2	Round 2
Q67	82.9	65.8	Yes		Yes		Yes	3	Round 2
Q46	81.4	48.7				Yes		1	Discarded
Q41	81.4	35.1				Yes		1	Discarded
Q56	81.0	65.8	Yes			Yes		2	Round 2
Q58	78.6	68.3		Yes	Yes			2	Round 2
Q38	74.4	62.2				Yes		1	Discarded
Q63	73.8	51.3				Yes		1	Discarded
Q66	73.2	63.2			Yes			1	Discarded
Q49	72.1	42.5						0	Discarded
Q44	69.8	77.5		Yes			Yes	2	Round 2
Q59	59.5	74.4				Yes		1	Discarded
TOTAL			6	2	6	8	2		

Table 80: Additional 'Free comments' from Section 2 of Round 1 Delphi

1	The constant reference to 'return to work' makes me, as a long term retired person, feel very much a second class of patient. In spite of being retired I do much volunteer work, some of it within the NHS umbrella.
2	While identifying and supporting folk to return to work there can be no pre- and post-operation stratification between this group and those who do not work. They both merit the same intensity of management to enable them to achieve the best possible outcome.
3	Employers will have their own risk assment program for work planning according to their industry. Intervention in programming of work duties may cause difficulty.
4	You are basing it all on those employed! Some of us are self-employed.....so not helpful at all.
5	Difficult to answer without considering all that we already do here for patients who are returning to work post joint replacement. We are an outpatient OT service advising and providing work simulation as part of rehab. Providing letters to GPs, employers and consultants with the required info re a patient's potential to return to work. Completing workplace assessments and capacity assessments with reports. Interventions based on the therapist's assessment of need and on a case by case basis

Section 3: Delphi Round 2

Table 81: Responses for Round 1 statements represented to the Delphi members in Round 2 (questionnaire Section 1)

Question	n	Strongly Agree	SA(%)	Agree	A(%)	Disagree	D(%)	Strongly Disagree	SD(%)	Don't Know	DK(%)	Combined SA/A (%)	Combined SD/D(%)
Q2	26	4	15.4%	13	50.0%	6	23.1%	2	7.7%	1	3.9%	65.4%	30.8%
Q3	26	6	23.1%	16	61.5%	2	7.7%	1	3.9%	1	3.9%	84.6%	11.5%
Q4	26	4	15.4%	17	65.4%	2	7.7%	0	0.0%	2	7.7%	80.7%	7.7%
Q5	26	7	26.9%	15	57.6%	3	11.5%	1	3.9%	0	0.0%	84.6%	15.4%
Q6	26	5	19.2%	13	50.0%	3	11.5%	1	3.9%	4	15.4%	69.2%	15.4%
Q7	26	6	23.1%	17	65.4%	2	7.7%	0	0.0%	1	3.9%	88.5%	7.7%
Q8	26	12	46.2%	10	38.5%	3	11.5%	0	0.0%	1	3.9%	84.6%	11.5%
Q9	26	6	23.1%	16	61.5%	3	11.5%	0	0.0%	1	3.9%	84.6%	11.5%
Q10	26	8	30.8%	16	61.5%	2	7.7%	0	0.0%	0	0.0%	92.3%	7.7%
Q11	26	6	23.1%	16	61.5%	2	7.7%	0	0.0%	2	7.7%	84.6%	7.7%
Q12	26	12	46.2%	7	26.9%	3	11.5%	1	3.9%	3	11.5%	73.2%	15.4%
Q13	26	7	26.9%	16	61.5%	2	7.7%	0	0.0%	1	3.9%	88.5%	7.7%
Q14	26	5	19.2%	12	46.2%	4	15.4%	0	0.0%	5	19.3%	65.4%	15.4%

Table 82: Responses for 'new' Round 2 statements (questionnaire Section 2)

	n	SA (n)	Strongly Agree (%)	A (N)	Agree (%)	D (n)	Disagree (%)	SD (n)	Strongly Disagree (%)	DK (n)	Don't Know (%)	SA/A (%)	D/SD (%)
Responsibility for delivery and co-ordination of the return to work intervention													
Q17	25	0	0.0%	2	8.0%	18	72.0%	4	16.0%	1	4.0%	8.0%	88.0%
Q18	25	5	20.0%	10	40.0%	6	24.0%	2	8.0%	2	8.0%	60.0%	32.0%
Q19	25	4	16.0%	11	44.0%	7	28.0%	1	4.0%	2	8.0%	60.0%	32.0%
Q20	25	8	32.0%	5	20.0%	9	36.0%	2	8.0%	1	4.0%	52.0%	44.0%
Q21	25	3	12.0%	10	40.0%	11	44.0%	0	0.0%	1	4.0%	52.0%	44.0%
Pre-operative identification of patients at 'higher risk' of prolonged sickness absence following surgery that may require additional individualised help and support													
Q22	25	4	16.0%	12	48.0%	6	24.0%	0	0.0%	3	12.0%	64.0%	24.0%
Q23	25	7	28.0%	13	52.0%	3	12.0%	0	0.0%	2	8.0%	80.0%	12.0%
Q24	25	1	4.0%	11	44.0%	11	44.0%	0	0.0%	2	8.0%	48.0%	44.0%
Q25	25	1	4.0%	9	36.0%	9	36.0%	1	4.0%	5	20.0%	40.0%	40.0%
Q26	25	2	8.0%	5	20.0%	13	52.0%	2	8.0%	3	12.0%	28.0%	60.0%
Pre-operative needs assessment													
Q27	25	7	28.0%	8	32.0%	5	20.0%	3	12.0%	2	8.0%	60.0%	32.0%
Q28	25	6	24.0%	14	56.0%	2	8.0%	2	8.0%	1	4.0%	80.0%	16.0%
Q29	25	11	44.0%	11	44.0%	2	8.0%	0	0.0%	1	4.0%	88.0%	8.0%
Q30	25	11	44.0%	11	44.0%	2	8.0%	0	0.0%	1	4.0%	88.0%	8.0%
Q31	25	5	20.0%	15	60.0%	4	16.0%	0	0.0%	1	4.0%	80.0%	16.0%
Q32	25	9	36.0%	15	60.0%	0	0.0%	0	0.0%	1	4.0%	96.0%	0.0%
Q33	25	10	40.0%	12	48.0%	3	12.0%	0	0.0%	0	0.0%	88.0%	12.0%
Q34	25	3	12.0%	14	56.0%	7	28.0%	0	0.0%	1	4.0%	68.0%	28.0%
Q35	25	17	68.0%	8	32.0%	0	0.0%	0	0.0%	0	0.0%	100.0%	0.0%
Post-operative identification of patients at risk of an extended period off work after surgery													
Q36	25	10	40.0%	11	44.0%	2	8.0%	0	0.0%	2	8.0%	84.0%	8.0%
Q37	25	8	32.0%	8	32.0%	5	20.0%	0	0.0%	4	16.0%	64.0%	20.0%
Q38	25	5	20.0%	18	72.0%	0	0.0%	0	0.0%	2	8.0%	92.0%	0.0%
Q39	25	3	12.0%	6	24.0%	10	40.0%	4	16.0%	2	8.0%	36.0%	56.0%
Q40	25	11	44.0%	12	48.0%	0	0.0%	0	0.0%	2	8.0%	92.0%	0.0%
Q41	25	6	24.0%	12	48.0%	6	24.0%	0	0.0%	1	4.0%	72.0%	24.0%
Additional care for Patients identified as 'higher risk' of an extended period off work after surgery													
Q42	25	4	16.0%	19	76.0%	2	8.0%	0	0.0%	0	0.0%	92.0%	8.0%
Q43	25	3	12.0%	16	64.0%	3	12.0%	0	0.0%	3	12.0%	76.0%	12.0%
Q44	25	4	16.0%	15	60.0%	2	8.0%	1	4.0%	3	12.0%	76.0%	12.0%
Q45	25	2	8.0%	21	84.0%	2	8.0%	0	0.0%	0	0.0%	92.0%	8.0%
Q46	25	4	16.0%	17	68.0%	1	4.0%	0	0.0%	3	12.0%	84.0%	4.0%
Scope of training for staff													
Q48	25	7	28.0%	12	48.0%	4	16.0%	1	4.0%	1	4.0%	76.0%	20.0%
Q49	25	11	44.0%	13	52.0%	1	4.0%	0	0.0%	0	0.0%	96.0%	4.0%
Q50	25	7	28.0%	15	60.0%	2	8.0%	0	0.0%	1	4.0%	88.0%	8.0%
Q51	25	5	20.0%	13	52.0%	1	4.0%	2	8.0%	4	16.0%	72.0%	12.0%

Q52	25	6	24.0%	10	40.0%	1	4.0%	0	0.0%	8	32.0%	64.0%	4.0%
Communicating occupational status and progress between stakeholders													
Q53	25	12	48.0%	12	48.0%	1	4.0%	0	0.0%	0	0.0%	96.0%	4.0%
Q54	25	8	32.0%	13	52.0%	2	8.0%	1	4.0%	1	4.0%	84.0%	12.0%
Q55	25	16	64.0%	8	32.0%	0	0.0%	0	0.0%	1	4.0%	96.0%	0.0%
Q56	25	7	28.0%	14	56.0%	2	8.0%	0	0.0%	2	8.0%	84.0%	8.0%
Q57	25	9	36.0%	10	40.0%	4	16.0%	1	4.0%	1	4.0%	76.0%	20.0%
Q58	25	6	24.0%	10	40.0%	5	20.0%	2	8.0%	2	8.0%	64.0%	28.0%
Q59	25	6	24.0%	15	60.0%	2	8.0%	0	0.0%	2	8.0%	84.0%	8.0%
Q60	25	2	8.0%	9	36.0%	11	44.0%	2	8.0%	1	4.0%	44.0%	52.0%
Q61	25	8	32.0%	8	32.0%	6	24.0%	2	8.0%	1	4.0%	64.0%	32.0%
Fit Notes													
Q62	25	11	44.0%	13	52.0%	1	4.0%	0	0.0%	0	0.0%	96.0%	4.0%
Q63	25	12	48.0%	12	48.0%	1	4.0%	0	0.0%	0	0.0%	96.0%	4.0%
Q64	25	3	12.0%	1	4.0%	13	52.0%	5	20.0%	3	12.0%	16.0%	72.0%
Q65	25	2	8.0%	13	52.0%	7	28.0%	1	4.0%	2	8.0%	60.0%	32.0%
Q66	25	6	24.0%	13	52.0%	4	16.0%	1	4.0%	1	4.0%	76.0%	20.0%
Q67	25	4	16.0%	3	12.0%	14	56.0%	2	8.0%	2	8.0%	28.0%	64.0%
Q68	25	2	8.0%	10	40.0%	8	32.0%	1	4.0%	4	16.0%	48.0%	36.0%
Format and delivery of patient information													
Q69	25	7	28.0%	12	48.0%	4	16.0%	0	0.0%	2	8.0%	76.0%	16.0%
Q70	25	6	24.0%	14	56.0%	5	20.0%	0	0.0%	0	0.0%	80.0%	20.0%
Q71	25	5	20.0%	15	60.0%	4	16.0%	0	0.0%	1	4.0%	80.0%	16.0%
Q72	25	3	12.0%	20	80.0%	1	4.0%	0	0.0%	1	4.0%	92.0%	4.0%
Q73	25	5	20.0%	10	40.0%	3	12.0%	1	4.0%	6	24.0%	60.0%	16.0%
Q74	25	4	16.0%	12	48.0%	7	28.0%	0	0.0%	2	8.0%	64.0%	28.0%
Q75	25	12	48.0%	11	44.0%	0	0.0%	0	0.0%	2	8.0%	92.0%	0.0%
Q76	25	1	4.0%	22	88.0%	0	0.0%	0	0.0%	2	8.0%	92.0%	0.0%
Q77	25	9	36.0%	13	52.0%	0	0.0%	0	0.0%	3	12.0%	88.0%	0.0%
When should the intervention commence?													
Q78	25	6	24.0%	7	28.0%	9	36.0%	0	0.0%	3	12.0%	52.0%	36.0%
Q79	25	4	16.0%	9	36.0%	10	40.0%	0	0.0%	2	8.0%	52.0%	40.0%
Q80	25	3	12.0%	13	52.0%	8	32.0%	0	0.0%	1	4.0%	64.0%	32.0%
Q81	25	0	0.0%	2	8.0%	20	80.0%	2	8.0%	1	4.0%	8.0%	88.0%
Defining return to work													
Q82	25	3	12.0%	8	32.0%	10	40.0%	1	4.0%	3	12.0%	44.0%	44.0%
Q83	25	2	8.0%	11	44.0%	9	36.0%	1	4.0%	2	8.0%	52.0%	40.0%
Q84	25	2	8.0%	4	16.0%	14	56.0%	2	8.0%	3	12.0%	24.0%	64.0%
Q85	25	1	4.0%	2	8.0%	16	64.0%	2	8.0%	4	16.0%	12.0%	72.0%
Q86	25	2	8.0%	9	36.0%	9	36.0%	0	0.0%	5	20.0%	44.0%	36.0%
The aim of the intervention													
Q87	25	6	24.0%	13	52.0%	2	8.0%	0	0.0%	4	16.0%	76.0%	8.0%
Q88	25	0	0.0%	11	44.0%	10	40.0%	0	0.0%	4	16.0%	44.0%	40.0%

Q89	25	1	4.0%	2	8.0%	16	64.0%	0	0.0%	6	24.0%	12.0%	64.0%
Measuring return to work													
Q90	25	5	20.0%	18	72.0%	2	8.0%	0	0.0%	0	0.0%	92.0%	8.0%
Q91	25	2	8.0%	16	64.0%	5	20.0%	0	0.0%	2	8.0%	72.0%	20.0%
Q92	25	0	0.0%	3	12.0%	15	60.0%	5	20.0%	2	8.0%	12.0%	80.0%
Q93	25	0	0.0%	11	44.0%	8	32.0%	0	0.0%	6	24.0%	44.0%	32.0%
Q94a	25	5	20.0%	10	40.0%	8	32.0%	2	8.0%	0	0.0%	60.0%	40.0%
Q94b	25	4	16.0%	12	48.0%	9	36.0%	0	0.0%	0	0.0%	64.0%	36.0%
Q94c	25	3	12.0%	10	40.0%	7	28.0%	3	12.0%	2	8.0%	52.0%	40.0%
Q94d	25	2	8.0%	2	8.0%	12	48.0%	5	20.0%	4	16.0%	16.0%	68.0%
Q95	25	5	20.0%	15	60.0%	3	12.0%	1	4.0%	1	4.0%	80.0%	16.0%
Q96	25	5	20.0%	16	64.0%	2	8.0%	0	0.0%	2	8.0%	84.0%	8.0%
Q97	25	8	32.0%	16	64.0%	0	0.0%	0	0.0%	1	4.0%	96.0%	0.0%
Q98	25	11	44.0%	12	48.0%	0	0.0%	0	0.0%	2	8.0%	92.0%	0.0%

Table 83: Additional ‘Free comments’ from Delphi Round 2

1	Patients should be encouraged to connect with organisations such as Arthritis Research UK/Arthritis Care who have excellent pre and post-surgery publications as well as access to self-management courses.
2	Peer support in the workplace is useful & potentially important
3	Possibility of Self-employed patients being given specific information, as they may need to return to work earlier than others due to financial pressures
4	Original questions 47, 48, 56, 58, 65 and 67 were all green. Why are they being asked again? I should add that for 65 I put "Strongly disagree" yet the table show zero for that item.
5	Return to work process will vary depending on the physical demands of the work. There is no advice for those who may not be able to continue that previous type of work.
6	Some of these questions are highly confusing asking only one answer for questions that originally had two answer options of important and deliverable.
7	Too much personal information being shared with employer
8	yes there are definitely 2 tiers of need
9	This is a good development. Some patients will feel enormous pressure to return to work but may need a range of interventions delivered at key stages of their recovery. Employers also need to be more involved in the process of work return.
10	Seems reasonable providing the movement between groups is made flexible and easy to facilitate
11	not yet clear how this dichotomy will be reached in a predictive framework?
12	Agree with stratifying into Gps A & B
13	All good ideas - I have concerns about who can deliver all the extra care. We have staffing shortages / overwork already
14	Sorry, this is all too complicated for me and I wish to withdraw from the scheme. Sorry, too much in-depth stuff.
15	agree that should access additional therapy if struggling, but this cannot be unrestricted pending return - the ability of the patient to actually return has not been defined and i am struggling to comment as to how one can predict which patients will need additional input - nor whether this will actually result in achieving return to work
16	ECONOMIC CASE FOR ALL OF THE ABOVE IS GOING TO BE CHALLENGING. ROUTINELY MOST THR PTS CURRENTLY GET NO PHYSIO IN THE NHS, AND TKR ARE SEEN IN GROUP SETTINGS. BUSINESS CASE FOR RETURNING TO WORK IS GOOD FOR UK PLC, BUT THIS DOES NOT HELP THE THERAPY MANAGER (CCG OR ACUTE) WHO HAS TO INCREASE SUPPORT TO THESE PTS WITH NO COST SAVING TO THEM.
17	My unit already provides a 2 week post-operative review and physiotherapy and return to work issues are discussed

Section 4: Delphi Round 3

Table 84: Round 3 Delphi responses

Role	Comments
Surgeon	I've been through the info and it all looks very good. Very thorough A lot for the patient to read but I guess there is a lot for them to go through. The employer booklet is good. The only bit I didn't like was the pictures on the first page of the patient workbook do not really reflect the patients that we will be dealing with (40-60yr olds). The pictures show a very young man and a very old man in a wheelchair. While they are not completely unreasonable we probably would want the first page to have relevant pics (like most of the others on the other pages)
Surgeon (Research lead for British Association for Surgery of the Knee (BASK))	Having been slightly sceptical about some of the outcomes from the project I think you have done a great job, it's a superb resource. I am sure final printing will be high quality but the nice colours on the documents are likely to be printed locally on NHS black and White printers and therefore - white on grey isn't great nor is grey on grey. P13 7 in 10 should read 7 out of 10 P13 personally I wouldn't include the reference to return to work at 24 weeks P17 I would like to be monitored by the occupational… intervention summary doc typo p6 /8 rtwc TOW should be to
Surgeon (Past-president for British Association for Surgery of the Knee (BASK))	**Patient Workbook** - Although strictly accurate it is unusual to place full stops when using "GP". - P6: Orange Bullet point 2: Start with "Of these 4 in 10" - P6 Blue Bullet 2 "adaptations". We are not American. - P8: Again an americanism "programme". Program refers to computer software. Trust me the age-group you are aiming at may well be irritated by the Americanisms. Whilst I think about it, be careful not to use "surgery" or worse "surgeries" when you mean "operation". Most of the time you use the word "surgery" "operation" would be more appropriate. - P24 Second last Bullet point: "periods" - P25 L4: "3 out of 4 (75%)" and then "4 in 10 (40%)". You did this at the beginning! - P25: Braking reaction time is a poor surrogate for safe driving. There are driver simulator centres that do a proper assessment (for a fee) for those who want the assurance, and for those where they have an impairment. - P25 Second column second paragraph: "At 4-6 weeks after your OPERATION". See comments above! **Employer booklet** - P2: End: "adaptations" - P3 Second column second section: "programme" - P6 second column: In written texts numbers starting sentences are written as words e.g. One in four (25%) It is not clear if you tested patients' and employers' views on their respective booklets. At first glance they appear long and complicated. However, on reflection, the patients who want to return to work will read them religiously, and those employers who want to support their staff will do so as it gives detailed and practical advice.
Patient (Patient lead NJR PLG)	I have reviewed the materials and think they are excellent. • I am hopeful that the specified commitment required to support those of working age return to work after surgery is available. The level and range of contact and time required is considerable. Without that commitment this programme will not be so successful. • I note on page 5 there is a suggestion to share the workbook knowledge with the patient's GP. In fact the discharged patient may have a lot of contact post surgery with the GP for purpose of prescription pain relief and signing of 'fit notes' so I consider it vital to involve/inform the GP team about the Return To Work intervention programme at the earliest stage. • The layout and explanation is clear. However, there is a lot to take in and consider so the patient needs to receive RTW booklet asap. This is indicated in the diagrammatic guide to the process on page 8. • The design with checklists and tickboxes makes the patient face the practical issues and really think about any obstacles on the journey back to work. This also has the effect of 'setting the agenda' for patients to move away from an entirely 'medical" model of surgery to fix a problem - to more about enabling them to continue to being active and independent. • Some patients will need more assistance and guidance than others as there is a lot of text. EG. Page 13 is suggesting that 10 weeks is a average target time for return to work , and that type of work had no real impact. These are key messages and could be at the top of the page followed by evidence.

	• I am aware of Dame Carol Black's review of the health of the working age population and its impact on the economy. This initiative will be valuable and could be rolled out for wider application. On a personal note, I am a patient with Rheumatoid Arthritis diagnosed in 1985. I managed to stay in work for 28 years, as opposed to the much shorter average of between 5-7 years at that time, because I worked for a large organisation with good commitment to occupational health who engaged with me from early in my diagnosis about how we would manage change and challenges. Later, through Arthritis Care, I met many people with no such support who 'dropped out' of the workplace after flares and surgeries because of fear, lack of support and encouragement, and indeed their pain and medical perception of their situation became amplified. Where I live people with arthritis comprise the second largest PIP claimant group. They are perfectly entitled to it but it is not a successful outcome. I think the OPAL pathway to return to work identifies the vital role of taking the patient past the immediate recovery from surgery to the place where shared decision making, timely support and understanding gets them back into their life.
Patient / Ambassador for Global alliance for MSK Health of the bone and joint decade	I think the work that the OPAL Team have worked wonders. The patient and employer booklets are first class... I'd love to see the slides in due course, please. What is the time line to rolling out the work? When can I share these data with my colleagues at the BOA's Patient Liaison group? will you be posting OPAL on LinkedIn?
Surgeon	The documents appear very professional with lots of information. Excellent job. My concern is that they are large and may be seen as a lot of extra work for already overworked staff. Looks like it will require dedicated staff ? funding. Some patients may read it all – but I suspect a minority in Liverpool?!
Research physiotherapist	Well done team…this looks a serious amount of work and it is great seeing it all together.
G.P RCGP lead for chronic pain (currently in clinical Research)	Thank you for this information. I fully support the pathway that you have designed and the accompanying materials are superb - we just have to hope that the system is adequately resourced. I have been discussing the problem of return to work with Lord Luce - the latter is pain management's biggest supporter in the House of Lords. He has a particular interest in pain and work and indeed chaired a focus group to feed back on the governments green paper on work. Could I send your documents to him, stressing that they are draft documents at present?
Employer (Head of Safety, Health and Quality)	Thank you for the documents they are very interesting and informative. Finning are already following the majority of the information for an employee returning to work after a Hip or Knee replacement. In our case the employee would return to work on a 'phased return' and 'restricted duties', we will also at this time adjust the start and working hours and if applicable, the work load. The checklist would be beneficial as it would probably provide more time to make the adjustments as the patient would read it on discharge and probably not leave it until they were due start back to work.
Employer	I think I may have received this in error.
Employer	Please could you remove me from the list as I will not be able to participate. Thank you.

Appendix 8: OPAL study roles and responsibilities for hospital orthopaedic teams members

Section 1: Roles and responsibilities

Outpatient clinic staff

- Complete tailored OPAL training
- Identify RTW patients prior to consultation with surgical team
- Ask RTW patients to complete occupational checklist prior to consultation with surgical team, explain:
- Why this information is being collected,
- That the surgeon will review this information and use it to assist the patient if they need to
- Model completion if necessary
- Give positive feedback to patient on completion
- Give surgeon the patient's completed occupational checklist
- Give patients listed for surgery the RTW workbook, explain that patients have contributed to content and design
- Present workbook positively, why it is being used, similarity to Red Book
- Refer to coping model examples
- Recommend patient reads RTW workbook and completes as much as they can (shows them relevant sections)
- Recommend patient asks employer to assist patient in completion if wishes and suggests who this might include, discuss possible difficulties and solutions re communicating with employer?
- Informs patient that they are expected to bring the workbook to every hospital appointment – and why, and that HOT will use it. Draw patient's attention to this instruction. Discuss potential reasons why this might not happen, and formulate solutions with patient
- Gives patient Employer RTW workbook to pass on, and why, and suggests who this might include
- Present workbook positively
- Suggests that patient might wish to meet with their employer to discuss RTW, and who this might include
- Explains to patient that the RTWC will be contacting them at least 4 weeks before their operation to discuss their RTW plan. Shows them photo of RTWC and contact details.
- Checks they have the patient's chosen method of contact, contact details, and optimum time to contact them have been completed on the occupational checklist
- Collects occupational checklist from surgeon and forwards to hospital RTW co-ordinator

Surgeon

- Complete tailored OPAL training
- Respond positively to, and refer to completed occupational checklist during consultation
- Give patient personal advice/information as to their potential RTW outcome
- Answer patient questions and concerns
- Support patient autonomy in decision about surgery
- Inform listed patients that they will be given a RTW workbook to read, and why, complete where possible, and bring to each subsequent appointment, presenting positive message
- Inform listed patients that they will receive an Employer workbook to give to their employer and why
- Explain that patient will be contacted by a RTWC at least 4 weeks prior to surgery to help them with their RTW plan if they need it. Names them.
- Explain that unexpected outcomes might result in the RTW plan being revised, and the RTWC will help them with this
- Summarise and record patient's RTW status / outcome in all outpatient clinic notes and following each appointment
- Communicate with GP at point patient is discharged from orthopaedic surgical care, outlining current RTW status and progress and on-going therapy received

Pre-operative assessment and education teams

- Complete tailored OPAL training
- Refer positively to contents and use of RTW workbook
- Ask patients if they have brought workbook to appointment, praise patients who have, refer to it during appointment/presentation
- Examples of patients work demands, barriers and facilitators, work modifications and RTW plans referred to in discussions and presentations
- Highlight importance of recovery/rehab in relation to work, pacing up activity
- Remind patient about role of RTWC

RTWC/deputy (for additional information see OPAL examples of developed materials)

- Complete tailored OPAL training
- Contacts patient at least 4 weeks prior to surgery (NB may have to do this out of office hours) to review/agree
- Information provided in occupational checklist
- Current job demands
- Provisional RTW date
- Perceived/potential barriers/facilitators
- Provisional RTW plan
- Refers on/signposts where appropriate
- Goals/steps
- This consultation should be documented in RTW co-ordinator workbook for that individual patient.
- Additional contact governed by patient need
- Refers positively to RTW workbook during discussions with patient
- Praises patient for bringing workbook to appointments
- Reminds patient to bring workbook when admitted to ward
- Refers to other patient examples/models of job demands/RTW plans etc
- Encourages and supports/advises/problem solves about contact with employer
- Advises patient that RTWC will assist with revised RTW plan if required
- Highlights RTW patients to teams managing preop education and assessment. Records this action in RTWC workbook
- Highlights RTW patients to ward teams when admitted for surgery. Records this action in RTWC workbook
- Liaises with inpatient teams post-operatively to determine whether there are any issues with early recovery that may impact on RTW plan
- Revises RTW plan with patient as required

- Ensures RTW plan documented in RTW workbook
- Supports post-operative rehabilitation plans and problem-solves potential barriers to adherence with patient based on individual need
- Checks helpline 3 x week, triages, advises, refers on, based on individual need
- Continues to provide point of access following discharge until 16 weeks post-surgery (8 weeks for feasibility study)
- Records any changes to patient's RTW progress / status / outcome in RTWC workbook

Senior ward nurse and doctor

- Complete tailored OPAL training
- Ask RTW patients if they have brought workbook into hospital and if not determine the reason for this. Give praise if workbook brought in.
- Refer positively to RTW workbook
- Summarise patients expected RTW outcome and RTW plan in ward discharge letter
- Provide patient with copy/copies to give to significant others
- Ask each patient whether they require a fit note on discharge
- Complete fit note in accordance with best practice guidelines and the hospital contract and with reference to the patient's RTW plan in their workbook

Ward therapists

- Complete tailored OPAL training
- Ask RTW patients if they have brought workbook into hospital and if not determine the reason for this. Give praise if workbook brought in.
- Refer positively to RTW workbook, enter notes as appropriate
- Liaise with RTWC to update them on the patient post-operative recovery prior to discharge
- Summarise and record patient's RTW status / outcome in all outpatient clinic notes and following each appointment

Appendix 9: Supporting information for the implementation strategy and feasibility assessment

Section 1: Training logs for each of the OPAL feasibility sites

South Tees training log

Role	Date of training
Physiotherapist - outpatients	11th May 2018
Physiotherapist - ward	11th May 2018
Physiotherapy Assistant - ward	11th May 2018
Specialist nurse – Pre-assessment and joint replacement clinic	11th May 2018
Pre Assessment Sister	11th May 2018
Trauma Out Patients Department Sister	11th May 2018
Physiotherapist	11th May 2018
Physiotherapist	11th May 2018
Research nurse	11th May 2018
Doctor –ward	22nd May 2018
Physiotherapist – ward	22nd May 2018
Physiotherapist – ward	22nd May 2018
Doctor – ward	22nd May 2018
Ward Sister	22nd May 2018
Nurse Practitioner	11th May 2018
Community Physiotherapist	11th May 2018
Physiotherapist – discharge team	11th May 2018
Nurse Practitioner	11th May 2018
Occupational Therapist	11th May 2018
Ward sister – Ward 25	11th May 2018
Surgical Care Practitioner*	11th May 2018
Ward Clerk	11th May 2018
Consultant Surgeon	16th May 2018
Consultant Surgeon	16th May 2018
Consultant Surgeon	25th May 2018
Research Nurse	23rd May 2018
Research Admin	23rd May 2018
Research Nurse	23rd May 2018

*Nominated RTWC

Northumbria training log

Role	Date of training
Physiotherapist	25th May 2018
Practice Development Lead*	25th May 2018
Research Nurse	25th May 2018
Senior Research Nurse	25th May 2018
Clinical Trials practitioner	25th May 2018
Consultant Surgeon	25th May 2018

*Nominated RTWC – Cascade training delivered by RTWC to relevant clinical teams (Surgeons, Ward, OPC)

Nottingham training log

Role	Date
Team Lead Physiotherapy*	23rd May 2018 + 11th July 2018
Consultant Surgeon	23rd May 2018
Consultant Surgeon	23rd May 2018
Consultant Surgeon	23rd May 2018
Outpatient assistant	11th June 2018
Outpatient assistant	11th June 2018
Outpatient assistant	11th June 2018
Outpatient assistant	11th June 2018
Deputy Sister, Outpatients	11th June 2018
Outpatient assistant	11th June 2018
Outpatient assistant	11th June 2018
Staff Nurse, Outpatients	11th June 2018
Registered Nurse, Outpatients	11th June 2018
Outpatient assistant	11th June 2018
Team Lead Occupational Therapy	12th June 2018
Band 4 Occupational Therapist	12th June 2018
Research Nurse	12th June 2018
Research Facilitator	12th June 2018
Staff Nurse, Outpatients	20th June 2018
Staff Nurse, Outpatients	20th June 2018
HCA, Outpatients	20th June 2018
TNA, Outpatients	20th June 2018
HCA, Outpatients	20th June 2018
Coordinator, Outpatients	20th June 2018
Outpatient assistant	20th June 2018
HCA, Outpatients	20th June 2018
Outpatient assistant	20th June 2018
Band 4 Physiotherapist*	20th June 2018
Ward Occupational Therapist	9th July 2018
Ward Occupational Therapist	9th July 2018
Ward Sister	9th July 2018
Staff Nurse - ward	9th July 2018
Deputy Ward Sister	9th July 2018
Ward Sister	9th July 2018

*Nominated RTWC

Section 2: Lists of training materials created to supplement OPAL implementation

Examples of study paperwork (See OPAL examples of developed materials)

- Job demands examples
- Impact on work examples
- Return to work plan examples

Training slides and documents (See OPAL examples of developed materials)

- Slides - Generic staff training slides Version1 and Version2
- Slides - Ways of helping people to change behaviour
- Slides - Occupational health
- Slides – Fit notes
- Slides – Work modifications
- Slides – Performance objectives: All staff
- Slides – Performance objectives: RTWC
- Slides – Performance objectives: Outpatient and Pre-assessment teams
- Slides – Performance objectives: Surgeons
- Slides – Performance objectives: Ward staff and inpatient therapy teams
- Slides – Research team slides
- Feasibility flowchart

Section 3: Checklist for intervention fidelity against performance objectives

Table 85: Checklist to determine whether patient performance objectives had been achieved

Performance Objective	Evidence of completion	Evidence source	How will this information be recorded
PO.1 Patient completes occupational checklist prior to appointment with surgeon	1) Evidence that the occupational checklist has been completed 2) Evidence that the patient recognises the occupational checklist has been completed from the baseline questionnaire 3) Evidence recorded in the RTWC workbook	1) Occupational checklist 2) Baseline questionnaire 'Section 1' 3) RTWC workbook 'Task 1'	1) Was occupational checklist completed - Yes/No 2) Section 1 question about completion of checklist 'When you arrived in clinic today were you given an occupational checklist by the clinic staff to complete prior to your appointment with the surgical team?' – Yes/No 3) Did RTWC document receipt of occupational checklist within the RTWC workbook (Task 1) – Yes/No
PO.2 Patient makes informed decision about surgery with respect to work	1) Evidence that the patient recognises the surgical team supported an informed decision about surgery from the baseline questionnaire	1) Baseline questionnaire 'Section 1'	1) Section 1 question about completion of checklist 'Did the member of the surgical team that saw you in clinic today talk about your job when discussing the options for treatment?' – Yes/No
PO.3 Patient acquaints self with key information about recovery and RTW provided in the patient RTW workbook and associated online information resources	1) Evidence that the patient workbook has been completed 2) Evidence that the patient has spent time completing the patient workbook from the 8 week questionnaire 3) Evidence that the patient has accessed the OPAL website from the 8 week questionnaire	1) Patient workbook 'Steps 1-3' 2) 8 week questionnaire 'Section 7' 3) 8 week questionnaire 'Section 7'	1) Was patient workbook completed – Was written information documented in any of sections 1,2 or 3 – Yes/No 2) Did patient state that they spent more that 10 minutes reading the information in the patient workbook based on question 'Approximately how much time did you spend in total reading the information provided in the patient 'return to work' workbook?' – Yes/No 3) Did patient access the OPAL website based on question 'Did you look at the OPAL website?' – Yes/No
PO.4 Patient brings RTW workbook to each hospital appointment including hospital inpatient stay Patient shares/discusses workbook with hospital staff	1) Evidence that the patient has brought their workbook to all hospital appointments from the 8 week questionnaire	1) 8 week questionnaire 'Section 7'	1) Patient states they brought patient workbook to all appointments based on response to question 'Did you bring your patient 'return to work' workbook to all hospital appointments?' – Yes/No
PO.5 Patient completes sections of RTW workbook that will help them understand the demands of their work and set an approximate RTW date With employer* as required	1) Evidence that Step 1 of the patient workbook has been completed 2) Evidence that Step 2 of the patient workbook has been completed 3) Evidence of interaction between RTWC and patient regarding steps 1 and 2	1) Patient workbook 'Step 1' 2) Patient workbook ' Step 2' 3) RTWC workbook 'Task 3'	1) Was patient workbook completed - Was written information documented in section 1 – Yes/No 2) Was patient workbook completed - Was written information documented in section 2 – Yes/No 3) Did RTWC document discussion with patient within the RTWC workbook about their work circumstances and planned date of RTW (Task 3) – Yes/No
PO.6 Patient uses information resources provided to identify and prioritise potential barriers and solutions to a safe and appropriate RTW, and to develop a RTW plan With employer* as required	1) Evidence that Step 3 of the patient workbook has been completed 2) Evidence of interaction between RTWC and patient documented in RTWC checklist (Task 3) 3) Evidence that patients used OPAL resources to help them develop a RTW plan from the 8 week questionnaire	1) Patient workbook 'Step 3' 2) RTWC workbook 'Task 3' 3) 8 week questionnaire 'Section 7'	1) Was patient workbook completed - Was written information documented in section 3 – Yes/No 2) Did RTWC document discussion with patient within the RTWC workbook about their proposed RTW plan (Task 3) – Yes/No 3) Did the patient state that the workbook helped them to develop their RTW plan based on the question 'After reading the patient 'return to work' workbook did you feel able to develop your own 'return to work' plan?' – Yes/No
PO.7 Patient discusses information within RTW workbook with RTW co-ordinator to help them further develop their RTW plan, during routine hospital pre-op appointment or by phone. This will include a minimum of 1 contact.	1) Evidence of interaction between RTWC and patient regarding Step 4 as recorded in patient workbook 2) Evidence of interaction between RTWC and patient regarding Step 4 as recorded in RTWC workbook 3) Evidence of interaction between RTWC and patient from the 8 week questionnaire	1) Patient workbook 'Step 4' 2) RTWC workbook 'Task 3' 3) 8 week questionnaire 'Section 7'	1) Was patient workbook completed – Was written information documented in section 4 – Yes/No 2) Did RTWC document contact with patient within the RTWC workbook with patient about their work circumstances and planned date of RTW (Task 3) – Yes/No 3) Did the patient state the RTWC contacted them based on the

The number and duration of further contacts will be governed by patient need based on progress and perceived level of 'risk' of prolonged sickness absence			question 'Were you contacted by the hospitals 'return to work' co-ordinator?' – Yes/No
PO.8 Patient provides employer* with written information provided by the HOT about their planned surgery and recovery/RTW advice	1) Evidence that the patient gave their employer the workbook based on the 8 week questionnaire	1) 8 week questionnaire 'Section 7'	1) Did the patient state they gave their employer the workbook based on the question 'Did you give the employer booklet to someone who you work with (e.g. employer, manager, human resources team, occupational health team, work colleague, friend / family)?' – Yes/No
PO.9 Patient meets with their employer* to discuss their recovery and RTW plan	1) Evidence of employer meeting as recorded in Step 5 of the patient workbook 2) Evidence that patient gave their employer the workbook based on the 8 week questionnaire	1) Patient workbook 'Step 5' 2) 8 week questionnaire 'Section 7'	1) Was patient workbook completed – Was written information documented in section 5 – Yes/No 2) Did the patient state they discussed their RTW plan based on the question 'Did you speak to someone you work with about the 'return to work' plan you developed in your patient 'return to work' workbook?'
PO.10 Patient communicates with employer* regarding surgical outcome and progress/recovery, by phone, email or face-to-face	No evidence collected		
PO.11 Patient revises RTW plan following surgery as necessary with their employer* and hospital staff	1) Evidence of revision of the RTW plan as recorded in Step 7 of the patient workbook 2) Evidence from RTW workbook of revision of RTW plan	1) Patient workbook 'Step 7' 2) RTWC workbook 'Task 8'	1) Was patient workbook completed – Was written information documented in section 7 – Yes/No 2) Did the RTWC document further interaction with the patient and revision of the RTW plan after surgery as recorded in the RTWC workbook (Task 8) – Yes/No
PO.12 Patient engages with RTWC via RTW helpline/answering service if having problems related to RTW for up to 16 weeks post- surgery	1) Evidence that the patient contacted the RTWC after surgery as recorded in Step 8 of the patient workbook 2) Evidence from RTW workbook regarding patient contact after surgery 3) Evidence that the patient contacted the RTWC after surgery from the 8 week questionnaire	1) Patient workbook 'Step 8' 2) RTWC workbook 'Task 7' 3) 8 week questionnaire 'Section7'	1) Was patient workbook completed – Was written information documented in section 8 – Yes/No 2) Did the RTWC document additional contact with the patient after surgery in the RTWC workbook (Task 7) 3) Did the patient state that they contacted the RTWC after surgery based on the response to question 'Did you use the OPAL support phone line after surgery?' – Yes/No
PO.13 Patient adheres to postoperative rehabilitation plan and advice	No evidence collected		

Table 86: Checklist to determine whether staff performance objectives had been achieved

Performance Objective	Evidence of Completion	Evidence source	How will this information be recorded
PO.1 The *HOT*: • Identifies existing team members to act as *RTWC* and deputy • Identifies existing staff members to act as *OPALCs* for their team: -ward -inpatient therapy team -outpatient clinic -pre-assessment and education • Develops a phone line / answerphone service for RTW patients to contact *RTWC* if they are having problems regarding RTW	1) Evidence that RTWC role has been designated at each study site from the local Principle investigator 2) Evidence of a RTWC phone line and contact details of RTWC printed in patient workbook	1) Principle Investigator email 2) Patient workbooks	1) Does the local research team have details for the RTWC? – Yes/No 2) Was the contact name and phone number for the RTWC printed in the OPAL patient booklets at each study site – Yes/No
PO.2 *The outpatient clinic team* identifies RTW patients in clinic prior to consultation with surgical team	1) Evidence from screening / consent logs that a representative sample of patients have been screened and consented 2) Evidence from the occupational checklist that a representative sample of patients have been screened for eligibility	1) Site screening / consent logs 2) Occupational checklists	1) Were patients screened and consented at each site with information about reasons for why patients were excluded if ineligible – Yes / No 2) Were occupational checklists completed at each site with information on the numbers of eligible and ineligible patients – Yes / No
PO.3 *The outpatient clinic team* requests RTW patients to complete occupational checklist prior to consultation with surgeon and explain its purpose to the patient, model completion if necessary and give positive feedback on completion *The outpatient clinic team* gives completed occupational checklist to surgeon prior to patient's appointment	1) Evidence that the occupational checklists have been completed 2) Evidence that the occupational checklists include the requested information	1) Occupational checklist 2) Occupational checklist	1) Were occupational checklists completed for the study participants – Yes / No 2) Did the occupational checklists contain information for all 8 questions in section 2 (Employment details) – Yes / No
PO.4 *Surgeon* discusses pros and cons of surgery with patient including expected timescales of surgery and recovery – in relation to the patient's usual work and refers to/responds positively to the patient's occupational checklist to enable patient to make informed decision about surgery; supports patient autonomy Provides patient with personal risk feedback on potential RTW outcomes Explores patients questions and concerns Informs listed patients that they will be given a RTW workbook to read and why, complete where possible, bring to each subsequent appointment, presenting positive message Informs listed patients that they will receive	1) Evidence from the baseline questionnaire the occupational checklist was used within the surgical consultation 2) Evidence from the baseline questionnaire the patients work was discussed when deciding on the options for treatment 3) Evidence from the baseline questionnaire that the surgical team discussed returning to work after surgery 4) Evidence from the baseline questionnaire that the surgical team discussed the OPAL program 5) Evidence from initial clinic letter that work and RTW was discussed within the initial surgical consultation 6) Evidence from initial clinic letter that the patient was offered eth OPAL RTW programme 7) Evidence from follow up clinic letter(s) that progress with RTW was communicated to the GP following surgery	1) Baseline questionnaire 'Section1' 2) Baseline questionnaire 'Section1' 3) Baseline questionnaire 'Section1' 4) Baseline questionnaire 'Section1' 5) Initial outpatient clinic letter 6) Initial outpatient clinic letter 7) Follow up outpatient clinic letter	1) Did patients respond 'Yes' to question 'Did the member of the surgical team that saw you in clinic today refer to the information on the occupational checklist during your consultation e.g. did they talk about the job you do and your specific work demands?' – Yes / No 2) Did patients respond 'Yes' to question 'Did the member of the surgical team that saw you in clinic today talk about your job when discussing the options for treatment?' – Yes / No 3) Did patients respond 'Yes' to question 'Did the member of the surgical team that saw you in clinic today talk about how and when you might return to work after surgery?' – Yes / No 4) Did patients respond 'Yes' to question 'Did the member of the surgical team that saw you in clinic today refer to the OPAL return to work programme?' – Yes / No 5) Did clinic letters that state the patient was in work and intending to return to work after surgery – Yes / No 6) Did clinic letters state the patient was offered the OPAL RTW program – Yes / No 7) Did clinic letters comment on the patients RTW status after surgery? – Yes / No

an Employer workbook and why, that the patient will be contacted by a RTWC at least 4 weeks prior to surgery and why. Names them. Explains that RTW plan may need to be revised and that RTWC will help with this Summarises and records patients RTW status/outcome in all clinic notes and following each appointment Communicates with GP at point patient is discharged from orthopaedic surgical care outlining current RTW status and progress and on-going therapy received			
PO.5 *The outpatient clinic team* provides all RTW patients listed for surgery with written RTW workbook and gain contact details for RTWC to contact patient as completed in occupational checklist Outpatient clinic staff inform/encourage patient to bring RTW workbook to each hospital appointment, and draw attention to this instruction in the workbook Discuss potential reasons why this might not happen, and formulate solutions with patient Recommend patients read workbook and complete as much as they can (show relevant sections); present workbook positively and refer to coping model examples Recommend patient asks employer to assist patient in completion if wishes and suggests who this might include, and discuss possible difficulties and solutions re communicating with employer Outpatient clinic staff explain to patient that the RTWC will contact them at least 4 weeks prior to surgery about their RTW plan	1) Evidence that patient workbook was received 2) Evidence that contact details form was completed 3) Evidence from the baseline questionnaire that the OPAL return to work program was explained to the patient 4) Evidence from the 8 week questionnaire that the patients received the workbook after being listed for surgery	1) Patient workbook 2) Contact details forms 3) Baseline questionnaire 'Section 1' 4) 8 week questionnaire 'Section 7'	1) Did patient return a patient workbook? – Yes / No 2) Was a contact details form completed? – Yes / No 3) Did patient respond 'Yes' to question 'After your appointment did a member of staff explain the OPAL return to work programme to you' – Yes / No 4) Did patient respond 'Yes' to question 'Did you receive the OPAL patient 'return to work' workbook after you were put on the waiting list for your knee replacement?' – Yes / No
PO.6 *The outpatient clinic team* provides all RTW patients listed for surgery with 'Employer RTW workbook' to share with their employer/colleagues* Outpatient clinic staff inform/encourage patient that giving the Employer RTW workbook to employer/ colleagues will help	1) Evidence that patients received the OPAL employer booklet 2) Evidence that they gave this booklet to someone in their place of work 3) Evidence that the patient discussed their RTW plan with someone in their place of work 4) Evidence form patient workbook that patient has a meeting with their employer to discuss their RTW	1) 8 week questionnaire 'Section 7' 2) 8 week questionnaire 'Section 7' 3) 8 week questionnaire 'Section 7' 4) Patient booklet 'Step 5'	1) Did patient respond 'Yes' to question 'Did you receive the OPAL employer booklet after you were put on the waiting list for your knee replacement?' – Yes / No 2) Did patient respond 'Yes' to question 'Did you give the employer booklet to someone who you work with (e.g. employer, manager, human resources team, occupational health team, work colleague, friend / family)?' – Yes / No 3) Did patient respond 'Yes' to question 'Did you speak to someone

them understand surgery and prepare for patient's RTW Suggests that patient might wish to meet with their employer to discuss RTW and who this might include Outpatient clinic staff suggest individuals in the workplace who might best receive the Employer RTW workbook			you work with about the 'return to work' plan you developed in your patient 'return to work' workbook?' – Yes / No 4) Did the patient with record information for 'Step 5' of the patient workbook? – Yes / No
PO.7 *The outpatient clinic team* collects patient's completed occupational checklist from surgeon and forwards to RTWC	1) Evidence from the RTWC workbook that occupational checklist was received by the RTWC	1) RTWC workbook	1) Was the receipt of the occupational checklist recorded in the RTWC workbook? – Yes / No
PO.8 *The pre-operative assessment and education teams* routinely include the topic of RTW in their clinics with examples of work demands, barriers and facilitators to RTW, RTW plans, importance of adhering to postop rehab plan/pacing up activities *The pre-operative assessment and education teams* ask if patients have brought their RTW workbook to appointment, praise patients, refer positively to content and use of the workbooks, and promote engagement with the RTWC	1) Evidence that OPAL was included in pre-assessment clinic 2) Evidence that pre-assessment teams asked patients whether they had brought their OPAL patient workbook with them to their pre-assessment appointment	1) 8 week questionnaire 'Section 7' 2) 8 week questionnaire 'Section 7'	1) Did patient respond 'Yes' to question 'Was OPAL / 'return to work' mentioned in the pre-assessment or pre-operative education class you attended prior to surgery?' – Yes / No 2) Did patient respond 'Yes' to question 'Did the pre-assessment / pre-operative education team ask you if you had brought your patient 'return to work' workbook with you?' – Yes / No
PO.9 *RTWC* contacts all RTW patients (phone/meet ups) at least 4 weeks prior to surgery to review: • information provided in the occupational checklist • information in the RTW workbook including - Current job demands - Provisional RTW date - Potential barriers and solutions to safe and appropriate RTW - The patient's provisional RTW plan All patients receive at least 1 contact with the RTW co-ordinator. This may be integrated within the pre-assessment / pre-admission process or done by phone. The number and duration of additional contacts will be governed by patient need based on progress and perceived level of 'risk' Refers positively to RTW workbook during discussions with patient: • Praises patient for bringing workbook	1) Evidence from patient workbook that RWTC contacted patient 2) Evidence form RTWC workbook that RTWC contacted patient	1) Patient workbook 'Step 4' 2) RTWC workbook 'Task 3'	1) Was information recorded in 'Step 4' of the patient workbook? – Yes / No 2) Was information recorded in 'Task 3' of the RTWC workbook? – Yes / No

to appointments • Reminds patient to bring workbook on admission • Refers to other patient examples /models of job demands/RTW plans etc Encourages discussion about/coaches patient regarding communication with patients employer Refers on/signposts where appropriate Sets goals/steps with patient Discusses the possibility of needing to revise RTW plan following surgery Documents all consultations in RTWC workbook			
PO.10 *RTWC* highlights RTW patients to ward teams managing *preop education and assessment* and records this action in RTWC workbook	1) Evidence from RTWC workbook that RTWC contacted pre-assessment teams	1) RTWC workbook 'Task 4'	1) Was information recorded in 'Task 4' of the patient workbook? – Yes / No
PO.11 *RTWC* highlights RTW patients to *the ward teams* when admitted for surgery and records this action in the RTWC workbook	1) Evidence from RTWC workbook that RTWC contacted ward teams	1) RTWC workbook ' Task 5'	1) Was information recorded in 'Task 5' of the patient workbook? – Yes / No
PO.12 *The ward team (nurse and doctor)* check RTW patients have brought workbook into hospital and if not determine the reason for this. Give praise if workbook brought in. Refer positively to RTW workbook.	1) Evidence from 8 week questionnaire that ward teams ask to view patient workbook	1) 8 week questionnaire 'Section 7'	1) Did patient respond 'Yes' to question 'Did the doctors and nurses on the ward ask to view the information in your patient 'return to work' workbook?' – Yes / No
PO.13 *Ward therapists* ask RTW patients if they have brought workbook into hospital, and if not determines the reason for this. Give praise if workbook brought in. Refer positively to RTW workbook, enter notes as appropriate Liaise with RTWC to update them on the patient's postop recovery prior to discharge	1) Evidence from 8 week questionnaire that ward therapy teams ask to view patient workbook 2) Evidence from RTWC workbook that ward therapy teams updated them on progress of patients after surgery	1) 8 week questionnaire 'Section 7' 2) RTWC workbook 'Task 6'	1) Did patient respond 'Yes' to question 'Did the therapy team (physiotherapists and occupational therapists) on the ward ask to view the information in your patient 'return to work' workbook?' – Yes / No 2) Was contact between RTWC and ward team documented in Task 6 of the RTWC workbook? – Yes / No
PO.14 *The RTWC* liaises with *inpatient teams* post-operatively to determine whether there are any issues with early recovery that may impact on the RTW plan The *RTWC* revises RTW plan with patient as required and ensures plan is documented in	1) Evidence from RTWC workbook that contact was made with the ward therapy teams after surgery 2) Evidence from the patient workbook that the RTW plan was revised after surgery	1) RTWC workbook 'Task 6' 2) Patient workbook 'Step 7'	1) Was contact between RTWC and ward team documented in Task 6 of the RTWC workbook? – Yes / No 2) Did the patient document changes to their RTW plan in 'Step 7' of their patient workbook? – Yes / No

patients RTW workbook The *RTWC* supports post-operative rehab plans and problem-solves potential barriers to adherence with patient			
PO.15 *The ward team (nurse/doctor)* summarises patient's expected RTW outcome and RTW plan in ward electronic discharge letter. A copy/copies will be given to the patient to share with employer, therapists etc. *The ward team (nurse/doctor)* praise/refer to the RTW workbook and remind the patient to use the RTW helpline following discharge if they are having problems *The ward team (nurse/doctor/therapist)* highlight the importance of adhering to the post op rehab plan	1) Evidence that the patient was given a copy of their discharge letter 2) Evidence that the patients RTW status and proposed RTW date was included in the discharge letter	1) 8 week questionnaire 'Section 7' 2) Discharge letter	1) Did patient respond 'Yes' to question 'Were you provided with a copy of your discharge letter?' – Yes / No 2) Was RTW status and RTW date documented in the discharge letter? – Yes / No
PO.16 *The specialist ward nurse/doctor* asks each patient whether they require a fit note on discharge and completes the fit note in accordance with best practice guidelines and the hospital contract, and with reference to the patient's RTW plan in their workbook	1) Evidence from electronic discharge that fit not was issued and duration of fit note recorded 2) Evidence from 8 week questionnaire that fit note was prescribed 3) Evidence from 8 week questionnaire and patient workbook that fit not corresponded with patients RTW plan	1) Discharge letter 2) 8 week questionnaire 'Section 2' 3) 8 week questionnaire 'Section 2' and patient booklet	1) Was the prescription of a fit note and its duration recorded in the hospital discharge letter – Yes / No 2) Did patient indicate they were given a fit note when they were discharged from hospital? – Yes / No 3) Was the length of the fit note recorded in section 2 of the 8 week questionnaire and did this correspond with the planned time off work (based on date of surgery and date of RTW from the patient workbook Step 3) – Yes / No
PO.17 *The RTWC* checks the RTW helpline 3 x wk, and triages, advises (e.g. phone call) or refers back to therapy services (based on local service structure and availability) based on individual need.	1) Evidence that the RTWC checked the phone line 3 times / week 2) Evidence that the RTWC actioned calls to the phone line 3) Evidence that RTWC documented actioned issues arising from calls to the phone line	1) RTWC workbook 'Task 7'	1) Did the RTWC record checking the phone line and contacting patients in the RTWC workbook 'Task 7' – Yes / No
PO.18 *Surgeon, HOT and outpatient therapy teams* summarise and record patient's RTW status / outcome in all outpatient clinic notes and following each appointment	1) Evidence that surgical team documented RTW status in all follow up clinic notes	1) Follow up OPC letters	1) Was RTW status documented in all of their follow up clinic letters? – Yes / No
PO.19 *Surgeon and HOT* communicate with GP at point patient is discharged from orthopaedic surgical care, outlining current RTW status and progress and on-going therapy received and encourage engagement with RTWC until16 weeks post-surgery (8 weeks for feasibility study)	1) Evidence that surgical team communicated RTW status in final follow up letter at point patient was discharged to GP	1) Follow up OPC letters	1) Was RTW status documented in their final follow up clinic letter? – Yes / No
PO.20 *RTWC* continues to provide a point of access to RTW advice for patients following discharge from orthopaedic surgical care until 16 weeks post-surgery (8 weeks for feasibility study). Records any changes to patient's RTW progress/status/outcome in RTWC workbook	1) Evidence from the RTWC workbook that changes to the patients RTW plan were documented	1) RTWC workbook 'Task 8'	1) Did the RTWC document changes to the RTW plan in Task 8 of the RTWC workbook? – Yes / No

Section 4: Feasibility Patient interviews

Sampling

Fifteen patients of the twenty-one patients who had agreed to be approached for interview, were recruited across three study sites. Of those not recruited, three were uncontactable, one did not respond to email contact and two were not approached in order to achieve a balance in recruitment across the three study sites. Of the fifteen participants, six had undergone THR and the nine a TKR. Six were employed in the private sector, four in the public sector, two were self-employed, two were in voluntary roles and one was an out-of-contract contract worker. The aim had been to interview patients at eight weeks post-surgery, however some were interviewed up to 13 weeks after surgery due to holiday periods, difficulty in making contact, and delays in obtaining agreement to take part in the interviews. All interviews were conducted by telephone between October 2018 and January 2019.

Interview quotations

As described in Chapter 10 interviews conducted in IM stage 6 (feasibility) with patients produced the following three themes:

- Understanding of OPAL
- Opinion of OPAL
- Experience of OPAL

Direct quotations to supplement the narrative description in chapter 6 are presented below:

THEME: Understanding of OPAL

Well I think it is about afterwards. It's about getting back to normality if you like, getting back to work and that's as I understood it. I mean that's what to me it was all about, and encouraging returning to work, or returning to normal activity even or whatever. 2062

I guess it's just getting back to work and having time off work to recover from the operation. And what is and isn't possible, I guess, and what is and isn't feasible following the surgery. 1060

Well basically my understanding was that it's like kind of tailored individually. Instead of in the past you've seen the surgeon, you go into surgery, and then you get a sick note for, I don't know, six or eight weeks, everybody gets the same. My understanding was that it's like tailored to you. What do you want out of it? When do you think you want, do you have a date that you want to get back to work, and how can we help you achieve that? And everybody gets involved in that. The doctor, the surgeon, your GP, everybody that you see. 2269

The other question that I have and I've still got it really is who is it designed to benefit?.....Is it the employer or is it me? And I wasn't clear about that really. Because if it's designed to rush me back to work why the hell would I want to rush back to work. 1367

It's just to research I think the benefits of people that have occupational health and help with going back to work and people that don't I think. That's what I think that it's about. 2260

THEME: Opinion of OPAL

...the idea of being able to actually have a discussion around going back to work and not just being off or being at work, having options, that has sort of pointed that out to me which I probably would have thought right I'll have six weeks, eight weeks, I'll have a number of weeks off and then I'll be going back to work full-time. So it was helpful inasmuch as knowing that that doesn't have to be that way. 1061

I think it's got to be given at quite an early stage and it fits in nicely with the preoperative stage process because not only does it give the patient, well the patient gets a bit of ownership in their own care don't they? 2063

They should be helping them to recover; the return to work should be a consequence of that. Do you know what I mean? So the important thing for the NHS should be not to get the people back to work but to get them back to health, right. And coming back to work is irrelevant. So I think you should be establishing what it is that people want. Like me, I didn't want a return to work, I wanted to return to sport. But for some people it might just simply be I want to be able to walk around the shops with my wife. And that might be what their expectation is. So that's what you should be striving to do and helping them to manage that and achieve that. And if they express that they want that desire to return to work because it might be a self-employed guy or something like that, so he would want to return to work wouldn't he? 1367

I already felt that I had the support and the plan already in place without the OPAL. But I mean I can imagine lots of people haven't..... it enabled the doctor to give me a longer fit note, which I found useful because I wasn't having to then go to the GP and chase him every couple of weeks. 2260

Well probably because of the way I am. I was going to return to work in some form as soon as I could and I didn't need a work coordinator to help me to get back to work. You know, because it's common sense if you've just had a major knee operation, you're not going to start moving kegs around or climbing ladders or whatever. So a lot of it was common sense and I didn't need a works coordinator to help me get back to work. 2366

THEME: Experience of OPAL

Return to Work Workbook

It was, well it was because it enabled the doctor to give me a longer fit note, which I found useful because I wasn't having to then go to the GP and chase him every couple of weeks. In that respect it was useful. And it was good to write it all down, my plans, even before the surgery. And then I can look now and see where I'm at with those plans, and I think I'm online with what I said, I'm on track with what I said before the surgery. So yes, it is a good reference, it's like a diary for you to look back at and say oh yes, I am doing. 2260

Well I put things in, set a date for review, make contact with xxxx (RTWC). Drive at six weeks, transfer to theatre (voluntary sector role). So I just, this is things that she put down when she interviewed me. 1366

If I'm honest again, because I related it to my work situation rather than a general return to work, I thought it was absolutely helpful, really helpful, because it was a guide to recovery and getting back to work. To have, if you like, a proper plan in place to get back to work and my understanding is that's what this is all about really. 2062

Well it's just really putting it down on paper what's already in my head really....
Neither useful nor not useful, not really anything, it's in my mind anyway. But obviously as it was a study I did it.... just because I know that that system is already in place with where I work. It would have been tremendously useful had I never been sick before. 2260

I took it (workbook) everywhere, every appointment I went to. I took it with me for the surgery, but it stayed in my bag because nobody mentioned it. 1061

Employer's Workbook
They weren't interested, no. I think they looked upon it as another thing that they had to do. 1360

I know that she looked at it. I told her initially that I'd agreed to take part in it and she said well done, that's really good. And I said is it. And she said yes, because if people don't take part in these sort of projects then things don't change, things aren't learned, things don't move forward, so well done for agreeing to do it. And she then happily took the employer handbook off me but we hadn't sort of really discussed it any further than that 1061

I tried to discuss it with occupational health, and she was a bit frightened, and she said she'd never seen it before and would have to speak to the consultant. 2260

She'd read the handbook and she'd made some notes, and she said that, obviously she said when do you think you'll be coming back? I said well I don't know, how long is a piece of string? ..... So financially it was finances that really decided me when I would go back. 2269
I know he'd got it next to him if we were going to discuss anything from it. But I think we'd already fully established the plan of action for the return a few week's previous, because in effect it's part of the policy and procedures within the organisation. 2063

OPAL Helpline
Yeah I would never ring something like that. So I probably noticed it, but it's just, me being the person I am I wouldn't, I'm not really the kind of person that would ring something like that. 1367

But between leaving hospital and getting an eight week review there's nothing in between. I get that, but I just think you need to emphasise the importance of the helpline and I should have used it. So I take personal responsibility for that. 2262

Yeah definitely, because I mean the first time I met her she went through the things with us, and she'd emphasise this is my phone number, if you've got any questions don't be frightened to ring. So again like I say you can't fault her on that, she's doing exactly what it says sort of thing. Because I think it's down to the individual person. I have said this to xxxx (RTWC) as well after I saw her, when I had last seen the surgeon after I'd been discharged. I said for other people this is brilliant. It wasn't, I'm not saying it wasn't beneficial, it was beneficial based on me, but not as many benefits as there probably would have been for other people. 2364

..when I did phone the back to work coordinator, actually I think I phoned her a couple of times, and it's always an answerphone. And so you have to leave a message .... but they don't always get back to you the same day, which is a bit frustrating. But then when they did get back to me it wasn't her, it was somebody else. 2269

She did mention it but I did actually ring that a couple times while I was off just to query different things which I did ....That wasn't a helpline though; that was just a thing about sick notes and stuff like that because I didn't know who to ring 1363

OPAL Website

I didn't actually realise there was a website if I'm honest. I might have been told there was, but I don't remember anybody saying about a website, if that makes sense. 2269

No. I use a computer as little as possible. I've got a Tesco mobile, which I pay £7.50 a month for and that's simple. No fancy phones. No computers. I don't want to know. 2366

Interaction with OPAL team

Oh yes definitely. I thought she was very good, very, she was approachable. You could ask her stuff, which I've not being a person who's been on the sick so I didn't know about sick notes and stuff like that. And she's helped me a lot with that, she found out about it. Also, I hadn't got a follow up appointment off the consultant and I queried that with her and she chased that up and got my appointment for us. 1363

Yeah, so she contacted me by email. And I emailed her back and said that I'd got the booklet and what have you. And then nothing happened at all, I didn't hear another thing from anybody.2268

A lady called xxxx (research nurse). I don't remember her surname. And that's the only person actually that I've seen. When I was in the hospital, they said somebody would come and see me in hospital and they didn't actually. I didn't see anybody. 1060

..guess my experience, this is just me personally, when I was asked about it I just said oh yeah, I'd help, not a problem. I didn't see why I wouldn't want to do it. But I got to be a bit fed up with it to be honest, because I just kept thinking well what is the point of this? Nobody's really interested, nobody was interested, apart from Mr xxxx (surgeon). I had a phone call to say oh you've got an appointment with Mr xxxx (surgeon) tomorrow, can you please make sure you bring your OPAL booklet. But apart from that I just felt that nobody was really interested in it, and maybe it's because it wasn't really, it's not established and people are unaware of it. 2269

Yeah, but like I say I can't, absolutely can't fault Mr xxxx (surgeon) and his team, they're outstanding.....And that's the thing, nobody's spoke to me about actually getting back to work. 2268

Section 5: Assessment of intervention effectiveness

Table 87: Participant Characteristics for the feasibility phase

	Hip (n=10)	Knee (n=16)	Total (n=26)
Age, years	N=10	N=14	N=24
Mean (SD)	57.3 (14.3)	55.4 (5.9)	56.2 (10.0)
Median (Q1, Q3)	57 (51, 64)	54 (51, 59)	54.5 (51, 63)
(min, max)	(34, 84)	(46, 66)	(34, 84)
Gender, n (%)			
Male	3 (30.0)	7 (43.8)	10 (38.5)
Female	7 (70.0)	8 (50.0)	15 (57.7)
Missing	0 (0.0)	1 (6.3)	1 (3.9)
Employment*, n(%)			
Full time	4 (40.0)	11 (68.8)	15 (57.7)
Part time	1 (10.0)	3 (18.8)	4 (15.4)
Self employed	1 (10.0)	2 (12.5)	3 (11.5)
Unpaid work	4 (40.0)	1 (6.3)	5 (19.2)
Other	0 (0.0)	0 (0.0)	0 (0.0)
Total time spent working in a week, hrs			
Mean (SD)	N=10	N=16	N=26
Median (Q1, Q3)	31.3 (12.5)	40.1 (23.4)	36.7 (20.1)
(min, max)	33.8 (20, 40)	37.5 (31.5, 45.5)	37.5 (23, 44)
	(14, 50)	(8, 112)	(8, 112)
Oxford Hip/Knee Score	N=10	N=16	N=26
Mean (SD)	17.4 (3.7)	17.3 (6.3)	17.3 (5.4)
Median (Q1, Q3)	16.5 (15, 19)	18 (11, 21.4)	17 (14, 21)
(min, max)	(14 ,26)	(8, 29)	(8, 29)

*multiple options can be selected

List of job titles give in the feasibility phase:

- Medical Sec / Receptionist
- Clinical Trials Data management & Trial Co-Ordination.
- Volunteer with Sea Cadets
- Carer for grandchildren
- Carer for grandchildren / Help Girls Club on saturdays & 1 week holiday club for 11 - 16 year olds
- Plater involved in the fabrication of Heavy Engineering
- Activity Co-Ordinator in childrens Hospice
- Volunteer with Age UK North Tyne
- Distributer Manager UK & Ireland
- Lab Technician
- HCA - Working in Pre-Op
- Trade Counter Assistant / Clinical Hypnotherapist
- CSI Operations Manager
- Work with Special Needs Children
- District Nurse.
- Operations Manager 'Royal Mail' Manage a Team of Managers operating units.
- Kitchen Porter & Lifting Involved
- Healthcare Assistant, Work at Friarage Hospital on Rutson Ward, Stroke Patients, Rehab, etc
- Intelligence Officer (Police Constable) at Cleveland Police
- Retail Wages Clerk, I work on a computer most of my shift. My work also involves walking
- SEN Teaching Assistant
- Receptionist Cardiology WGH
- Carer for Husband / Was also working in retail part time
- Publican
- Production Operator

Table 88: Details on the activities relating to participants jobs in the feasibility phase

	Hip (n=10)	Knee (n=16)	Total (n=26)
Are any of the following activities essential to your work:			
Standing/walking for prolonged periods? n(%)			
Yes	7 (70.0)	14 (87.5)	21 (80.8)
No	3 (0.0)	2 (12.5)	5 (19.2)
Sitting for prolonged periods? n(%)			
Yes	7 (70.0)	11 (68.8)	18 (69.2)
No	3 (30.0)	5 (31.3)	8 (30.8)
Kneeling? n(%)			
Yes	4 (40.0)	5 (31.3)	9 (34.6)
No	6 (60.0)	11 (68.8)	17 (65.4)
Climbing, including stairs? n(%)			
Yes	9 (90.0)	11 (68.8)	20 (76.9)
No	1 (10.0)	5 (31.3)	6 (23.1)
Lifting/manual handling? n(%)			
Yes	6 (60.0)	9 (56.3)	15 (57.7)
No	4 (40.0)	7 (43.8)	11 (42.3)
Bending or crouching? n(%)			
Yes	8 (80.0)	13 (81.3)	21 (80.8)
No	2 (20.0)	3 (18.8)	5 (19.2)
Are you required to work rotating shifts at work? n(%)			
Yes	5 (50.0)	7 (43.8)	12 (46.2)
No	5 (50.0)	9 (56.3)	14 (53.9)
Do you drive to work? n(%)			
Yes	9 (90.0)	12 (75.0)	21 (80.8)
No	1 (10.0)	4 (25.0)	5 (19.2)
Do you drive whilst at work? n(%)			
Yes	5 (50.0)	5 (31.3)	10 (38.5)
No	4 (40.0)	10 (62.5)	14 (53.9)
Missing	1 (10.0)	1 (6.3)	2 (7.7)
Do you have access to occupational health services at work? n(%)			
Yes	3 (30.0)	8 (50.0)	11 (42.3)
No	7 (70.0)	5 (31.3)	12 (46.2)
Don’t know	0 (0.0)	3 (18.8)	3 (11.5)

Table 89: Involvement of participants with the OPAL intervention in the feasibility phase

	Hip (n=10)	Knee (n=16)	Total (n=26)
Before the review with surgical team			
Were you given an occupational checklist by to complete prior to your appointment with the surgical team?			
Yes	5 (50.0)	15 (93.8)	20 (76.9)
No	4 (40.0)	1 (6.3)	5 (19.2)
Don't know	1 (10.0)	0 (0.0)	1 (3.9)
Approximately how long did it take you to complete the occupational checklist (mins)?	N=8	N=14	N=22
Mean (SD)	5.4 (3.2)	13.6 (15.4)	10.7 (12.9)
Median (Q1, Q3)	5 (3.5, 7.5)	6.5 (2, 20)	5 (2, 10)
(min, max)	(1.5, 10)	(2, 55)	(1.5, 55)
During the review: Did a member of the surgical team…			
Refer to the information on the occupational checklist during your consultation?			
Yes	5 (50.0)	15 (93.8)	20 (76.9)
No	4 (40.0)	1 (6.3)	5 (19.2)
Don't know	1 (1.0)	0 (0.0)	1 (3.9)
Talk about your job when discussing the options for treatment?			
Yes	9 (90.0)	13 (81.3)	22 (84.6)
No	1 (10.0)	2 (12.5)	3 (11.5)
Don't know	0 (0.0)	1 (6.3)	1 (3.9)
Talk about how and when you might return to work after surgery?			
Yes	7 (70.0)	11 (68.8)	18 (69.2)
No	3 (30.0)	5 (31.3)	8 (30.8)
Don't know	0 (0.0)	0 (0.0)	0 (0.0)
Refer to the OPAL return to work programme?			
Yes	9 (90.0)	14 (87.5)	23 (88.5)
No	1 (10.0)	2 (12.5)	3 (11.5)
Don't know	0 (0.0)	0 (0.0)	0 (0.0)
After the review			
Did a member of staff explain the OPAL return to work programme to you?			
Yes	10 (100.0)	15 (93.8)	25 (96.2)
No	0 (0.0)	1 (6.3)	1 (3.9)
Don't know	0 (0.0)	0 (0.0)	0 (0.0)

Table 90: The General Self-Efficacy Scale

	Hip (n=10)	Knee (n=16)	Total (n=26)
Baseline	N=10	N=16	N=26
Mean (SD)	31.5 (4.1)	33.4 (5.4)	32.6 (4.9)
Median (Q1, Q3)	30.5 (29, 35)	35 (30.5, 37)	33.5 (29, 37)
(min, max)	(26, 38)	(22, 40)	(22, 40)

Table 91: Time to return to work post-surgery for the participants in the feasibility phase

	Hip (n=10)	Knee (n=16)	Total (n=26)
Time, weeks	N=5	N=5	N=10
Mean (SD)	5.2 (4.8)	9.7 (5.7)	7.4 (5.5)
Median (Q1, Q3)	4.4 (3, 4.6)	6.3 (5.9, 13.7)	5.4 (4.4, 13.3)
(min, max)	(0.6, 13.3)	(5, 17.7)	(0.6, 17.7)

Table 92: Details of the participants return to work in the feasibility phase – combined over time points

	Hip (n=10)	Knee (n=16)	Total (n=26)
Did you return to work following your surgery? n(%)	N=10	N=16	N=26
Yes	5 (50.0)	5 (31.3)	10 (38.5)
No	3 (30.0)	6 (37.5)	9 (34.6)
Missing*	2 (20.0)	5 (31.3)	7 (26.9)
If yes:			
Did you return to your usual hours and duties? n(%)	N=5	N=5	N=10
Yes	2 (40.0)	0 (0.0)	2 (20.0)
No	3 (60.0)	5 (100.0)	8 (80.0)
Missing	0 (0.0)	0 (0.0)	0 (0.0)
If no, how did you return:			
Reduced hours, usual duties	2 (40.0)	1 (20.0)	3 (30.0)
Usual hours, amended duties	1 (20.0)	1 (20.0)	2 (20.0)
Reduced hours and amended duties	1 (20.0)	3 (60.0)	4 (40.0)
Missing	1 (20.0)	0 (0.0)	1 (10.0)
If you returned on reduced hours, how many did you work in the first week:			
Mean (SD)	N=2	N=4	N=6
Median (Q1, Q3)	13 (9.9)	14 (6.3)	13.7 (6.6)
(min, max)	13 (6, 20)	15 (9, 19)	15 (6, 20)
	(6, 20)	(6, 20)	(6, 20)
Were any adaptions made to your workplace? n(%)			
Yes	1 (20.0)	2 (40.0)	3 (30.0)
No	4 (80.0)	3 (60.0)	7 (70.0)
Were any changes made to your pattern of work? n(%)			
Yes	1 (20.0)	3 (60.0)	4 (40.0)
No	4 (80.0)	2 (40.0)	6 (60.0)

*Missing data includes those who were withdrawn from the study

Table 93: Details of the participants fit note use in the feasibility phase, by time point

	Hip (n=10)	Knee (n=16)	Total (n=26)
Have you been provided with a 'fit note' following your recent operation?			
Week 8	N=8	N=13	N=21
Yes	3 (37.5)	8 (61.5)	11 (52.4)
No	5 (62.5)	2 (15.4)	7 (33.3)
Missing	0 (0.0)	3 (23.1)	3 (14.3)
Week 16			
Yes	2 (25.0)	4 (30.8)	6 (28.6)
No	4 (50.0)	4 (30.8)	8 (38.1)
Missing	2 (25.0)	5 (38.5)	7 (33.3)
How many additional fit notes have you received after the one at discharge?	N=1	N=4	N=5
Mean (SD)	3 (-)	1.3 (0.5)	1.6 (0.9)
Median (Q1, Q3)	- (-, -)	1 (1, 1.5)	1 (1, 2)
(min, max)	(-, -)	(1, 2)	(1, 3)
How long was it for, weeks:			
Week 8			
Mean (SD)	N=5	N=7	N=12
Median (Q1, Q3)	5.6 (5.5)	6.4 (2.9)	6.1 (4.0)
(min, max)	6 (0, 10)	6 (6, 7)	6 (4, 8.5)
	(0, 12)	(2, 12)	(0, 12)
Week 16	N=6	N=8	N=14
Mean (SD)	2 (4.9)	2.9 (3.4)	2.5 (3.9)
Median (Q1, Q3)	0 (0, 0)	2 (0, 5.5)	0 (0, 4)
(min, max)	(0, 12)	(0, 8)	0 (0, 12)
Which of the following options were selected:			
Week 8	N=8	N=13	N=21
You are NOT fit for work	2 (25.0)	5 (38.5)	7 (33.3)
You MAY be fit for work taking in to account - a phased return to work	0 (0.0)	2 (15.4)	2 (9.5)
You MAY be fit for work taking in to account - amended duties	0 (0.0)	1 (6.7)	1 (4.8)
You MAY be fit for work taking in to account - altered hours	0 (0.0)	1 (7.7)	1 (4.8)

You MAY be fit for work taking in to account - workplace adaptions	1 (12.5)	0 (0.0)	1 (4.8)
Don't know/Unsure	2 (25.0)	0 (0.0)	1 (4.8)
Week 16	N=8	N=16	N=26
You are NOT fit for work	0 (0.0)	2 (15.4)	2 (9.5)
You MAY be fit for work taking in to account - a phased return to work	0 (0.0)	2 (15.4)	2 (9.5)
You MAY be fit for work taking in to account - amended duties	0 (0.0)	2 (15.4)	2 (9.5)
You MAY be fit for work taking in to account - altered hours	0 (0.0)	0 (0.0)	0 (0.0)
You MAY be fit for work taking in to account - workplace adaptions	0 (0.0)	0 (0.0)	0 (0.0)
Don't know/Unsure	2 (25.0)	0 (0.0)	2 (9.5)
When did you first drive following your operation? (Weeks post-surgery)			
Week 8	N=6	N=8	N=14
Mean (SD)	5.7 (1.4)	6.4 (1.1)	6.1 (1.2)
Median (Q1, Q3)	6 (6,6)	6.5 (5.5, 7)	6 (6, 7)
(min, max)	(3, 7)	(5, 8)	(3, 8)
Week 16	N=5	N=8	N=13
Mean (SD)	5 (1.2)	6.6 (1.5)	6 (1.6)
Median (Q1, Q3)	5 (5, 6)	6.5 (6, 7.5)	6 (5, 7)
(min, max)	(3, 6)	(4, 9)	(3, 9)s

Table 94: Readiness to return to work scale for the feasibility phase, each response is scored 1 (strongly disagree) to 5 (strongly agree), and responses have been grouped into agreement, neutral and disagreement with each statement.

	Hip (n=10)	Knee (n=16)	Total (n=26)
For those not back in work yet:			
You don't think you will ever be able to go back to work: n(%)			
Week 8	N=4	N=6	N=10
Disagree	3 (75.0)	5 (71.4)	8 (80.0)
Neutral	0 (0.0)	0 (0.0)	0 (0.0)
Agree	1 (25.0)	1 (16.7)	2 (20.0)
Mean (SD)	1.5 (1.0)	1.3 (0.8)	1.4 (0.8)
Week 16	N=1	N=3	N=4
Disagree	1 (100.0)	3 (100.0)	4 (100.0)
Neutral	0 (0.0)	0 (0.0)	0 (0.0)
Agree	0 (0.0)	0 (0.0)	0 (0.0)
Mean (SD)	1.0 (-)	1.0 (0.0)	1 (0.0)
As far as you're concerned, there is no point in thinking about returning to work: n(%)			
Week 8	N=4	N=6	N=10
Disagree	4 (100.0)	5 (83.3)	9 (90.0)
Neutral	0 (0.0)	0 (0.0)	0 (0.0)
Agree	0 (0.0)	1 (16.7)	1 (10.0)
Mean (SD)	1.3 (0.5)	1.8 (1.2)	1.6 (1.0)
Week 16	N=1	N=3	N=4
Disagree	1 (100.0)	3 (100.0)	4 (100.0)
Neutral	0 (0.0)	0 (0.0)	0 (0.0)
Agree	0 (0.0)	0 (0.0)	0 (0.0)
Mean (SD)	1.0 (-)	1.3 (0.6)	1.3 (0.5)

You are actively doing things now to get back to work: n(%)			
Week 8	N=4	N=6	N=10
Disagree	0 (0.0)	0 (0.0)	0 (0.0)
Neutral	1 (25.0)	1 (16.7)	2 (20.0)
Agree	3 (75.0)	5 (83.3)	8 (80.0)
Mean (SD)	4.3 (1.0)	4.2 (0.8)	4.2 (0.8)
Week 16	N=1	N=3	N=4
Disagree	0 (0.0)	0 (0.0)	0 (0.0)
Neutral	0 (0.0)	0 (0.0)	0 (0.0)
Agree	1 (100.0)	3 (100.0)	4 (100.0)
Mean (SD)	4.0 (-)	4.3 (0.6)	4.3 (0.5)
Physically, you are starting to feel ready to go back to work: n(%)			
Week 8	N=4	N=6	N=10
Disagree	0 (0.0)	1 (16.7)	1 (10.0)
Neutral	0 (0.0)	1 (16.7)	1 (10.0)
Agree	4 (100.0)	4 (66.7)	8 (80.0)
Mean (SD)	4.5 (0.6)	3.5 (0.8)	3.9 (0.9)
Week 16	N=1	N=3	N=4
Disagree	0 (0.0)	0 (0.0)	0 (0.0)
Neutral	0 (0.0)	0 (0.0)	0 (0.0)
Agree	1 (100.0)	3 (100.0)	4 (100.0)
Mean (SD)	4.0 (-)	4.3 (0.6)	4.3 (0.5)
You have been increasing your activities at home in order to build up your strength to go back to work: n(%)			

Week 8	N=4	N=6	N=10
Disagree	0 (0.0)	1 (16.7)	1 (10.0)
Neutral	0 (0.0)	0 (0.0)	0 (0.0)
Agree	4 (100.0)	5 (83.3)	9 (90.0)
Mean (SD)	4.8 (0.5)	3.8 (1.0)	4.2 (0.9)
Week 16	N=1	N=3	N=4
Disagree	0 (0.0)	0 (0.0)	0 (0.0)
Neutral	0 (0.0)	0 (0.0)	0 (0.0)
Agree	1 (100.0)	3 (100.0)	4 (100.0)
Mean (SD)	4.0 (-)	4.3 (0.6)	4.3 (0.5)
You are getting help from others to return to work: n(%)			
Week 8	N=4	N=6	N=10
Disagree	0 (0.0)	1 (16.7)	1 (10.0)
Neutral	1 (25.0)	0 (0.0)	1 (10.0)
Agree	3 (75.0)	5 (83.3)	8 (80.0)
Mean (SD)	4.3 (1.0)	3.5 (1.2)	3.8 (1.1)
Week 16	N=1	N=3	N=4
Disagree	0 (0.0)	0 (0.0)	0 (0.0)
Neutral	1 (100.0)	1 (33.3)	2 (50.0)
Agree	0 (0.0)	2 (66.7)	2 (50.0)
Mean (SD)	3.0 (-)	4.0 (1.0)	3.8 (1.0)
You are not ready to go back to work: n(%)			
Week 8	N=4	N=6	N=10
Disagree	1 (25.0)	3 (50.0)	4 (40.0)
Neutral	1 (25.0)	0 (0.0)	1 (1.0)

Agree	2 (50.0)	3 (50.0)	5 (50.0)
Mean (SD)	3 (1.4)	2.8 (1.3)	2.9 (1.3)
Week 16	N=1	N=3	N=4
Disagree	0 (0.0)	3 (100.0)	3 (75.0)
Neutral	0 (0.0)	0 (0.0)	0 (0.0)
Agree	1 (100.0)	0 (0.0)	1 (25.0)
Mean (SD)	4.0 (-)	1.7 (0.6)	2.3 (1.3)
You have found strategies to make your work manageable so you can return to work: n(%)			
Week 8	N=4	N=6	N=10
Disagree	0 (0.0)	1 (16.7)	1 (10.0)
Neutral	2 (50.0)	2 (33.3)	4 (40.0)
Agree	2 (50.0)	3 (50.0)	5 (50.0)
Mean (SD)	3.8 (1.0)	3.5 (1.0)	3.6 (1.0)
Week 16	N=1	N=3	N=4
Disagree	0 (0.0)	0 (0.0)	0 (0.0)
Neutral	1 (100.0)	1 (33.3)	2 (50.0)
Agree	0 (0.0)	2 (6.7)	2 (50.0)
Mean (SD)	3.0 (-)	4.0 (1.0)	3.8 (1.0)
You have been wondering if there is something you could do to return to work: n(%)			
Week 8	N=4	N=6	N=10
Disagree	1 (25.0)	3 (50.0)	4 (40.0)
Neutral	1 (25.0)	1 (16.7)	2 (20.0)
Agree	2 (50.0)	1 (16.7)	3 (30.0)
Missing	0 (0.0)	1 (16.7)	1 (10.0)
		N=5	N=9

Mean (SD)	3.5 (1.3)	2.6 (0.9)	3 (1.1)
Week 16	N=1	N=3	N=4
Disagree	0 (0.0)	0 (0.0)	0 (0.0)
Neutral	1 (100.0)	0 (0.0)	1 (25.0)
Agree	0 (0.0)	3 (0.0)	3 (75.0)
Mean (SD)	3.0 (-)	4.3 (0.6)	4.0 (0.8)
You have a date for your return to work: n(%)			
Week 8	N=4	N=6	N=10
Disagree	2 (50.0)	2 (33.3)	4 (40.0)
Neutral	1 (25.0)	1 (16.7)	2 (20.0)
Agree	1 (25.0)	2 (33.3)	3 (30.0)
Missing	0 (0.0)	1 (16.7)	1 (10.0)
		N=5	N=9
Mean (SD)	2.5 (1.3)	3 (1.6)	2.8 (1.4)
Week 16	N=1	N=3	N=4
Disagree	0 (0.0)	0 (0.0)	0 (0.0)
Neutral	1 (100.0)	0 (0.0)	1 (25.0)
Agree	0 (0.0)	3 (100.0)	3 (75.0)
Mean (SD)	3.0 (-)	5.0 (0.0)	4.5 (1.0)
You wish you had more ideas about how to get back to work: n(%)			
Week 8	N=4	N=6	N=10
Disagree	2 (50.0)	4 (66.7)	6 (60.0)
Neutral	1 (25.0)	0 (0.0)	1 (10.0)
Agree	1 (25.0)	1 (16.7)	2 (20.0)
Missing	0 (0.0)	1 (16.7)	1 (10.0)
		N=5	N=9
Mean (SD)	2.3 (1.5)	2.2 (1.1)	2.2 (1.2)

Week 16	N=1	N=3	N=4
Disagree	0 (0.0)	2 (66.7)	2 (50.0)
Neutral	0 (0.0)	1 (33.3)	1 (25.0)
Agree	1 (100.0)	0 (0.0)	1 (25.0)
Mean (SD)	4.0 (-)	1.7 (1.2)	2.3 (1.5)
You would like some advice about how to go back to work: n(%)			
Week 8	N=4	N=6	N=10
Disagree	1 (25.0)	3 (50.0)	4 (40.0)
Neutral	2 (50.0)	0 (0.0)	2 (20.0)
Agree	1 (25.0)	2 (33.3)	3 (30.0)
Missing	0 (0.0)	1 (16.7)	1 (10.0)
		N=5	N=9
Mean (SD)	2.8 (1.3)	2.8 (1.6)	2.8 (1.4)
Week 16	N=1	N=3	N=4
Disagree	0 (0.0)	2 (66.7)	2 (50.0)
Neutral	0 (0.0)	1 (33.3)	1 (25.0)
Agree	1 (100.0)	0 (0.0)	1 (25.0)
Mean (SD)	4.0 (-)	1.7 (1.2)	2.3 (1.5)
As far as you are concerned, you don't need to go back to work ever: n(%)			
Week 8	N=4	N=6	N=10
Disagree	4 (100.0)	5 (83.3)	9 (90.0)
Neutral	0 (0.0)	0 (0.0)	0 (0.0)
Agree	0 (0.0)	0 (0.0)	0 (0.0)
Missing	0 (0.0)	1 (16.7)	1 (10.0)
		N=5	N=9
Mean (SD)	1 (0)	1.2 (0.4)	1.1 (0.3)

Week 16	N=1	N=3	N=4
Disagree	1 (100.0)	2 (66.7)	3 (75.0)
Neutral	0 (0.0)	1 (33.3)	1 (25.0)
Agree	0 (0.0)	0 (0.0)	0 (0.0)
Mean (SD)	1.0 (-)	1.7 (1.2)	1.5 (1.0)
For those back at work:			
You are doing everything you can to stay at work: n(%)			
Week 8	N=4	N=3	N=7
Disagree	0 (0.0)	0 (0.0)	0 (0.0)
Neutral	0 (0.0)	0 (0.0)	0 (0.0)
Agree	4 (100.0)	3 (100.0)	7 (100.0)
Mean (SD)	4.8 (0.5)	4.7 (0.6)	4.7 (0.5)
Week 16	N=5	N=5	N=5
Disagree	0 (0.0)	0 (0.0)	0 (0.0)
Neutral	0 (0.0)	0 (0.0)	0 (0.0)
Agree	5 (100.0)	5 (100.0)	10 (100.0)
Mean (SD)	4.6 (0.5)	4.8 (0.4)	4.7 (0.5)
You have learnt different ways to cope with your pain so that you can stay at work: n(%)			
Week 8	N=4	N=3	N=7
Disagree	3 (75.0)	0 (0.0)	3 (42.9)
Neutral	0 (0.0)	0 (0.0)	0 (0.0)
Agree	1 (25.0)	3 (100.0)	4 (57.1)
Mean (SD)	2.5 (1.7)	4.7 (0.6)	3.4 (1.7)
Week 16	N=5	N=5	N=10
Disagree	2 (40.0)	0 (0.0)	2 (20.0)
Neutral	1 (20.0)	0 (0.0)	1 (1.0)

Agree	2 (40.0)	5 (100.0)	7 (7.0)
Mean (SD)	2.6 (1.5)	4.8 (0.4)	3.7 (1.6)
You are taking steps to prevent having to go off work again: n(%)			
Week 8	N=4	N=3	N=7
Disagree	1 (25.0)	0 (0.0)	1 (14.3)
Neutral	1 (25.0)	1 (33.3)	2 (28.6)
Agree	2 (50.0)	2 (66.7)	4 (57.1)
Mean (SD)	3.5 (1.3)	4.3 (1.2)	3.9 (1.2)
Week 16	N=5	N=5	
Disagree	2 (40.0)	0 (0.0)	2 (20.0)
Neutral	1 (20.0)	0 (0.0)	1 (10.0)
Agree	2 (40.0)	5 (100.0)	7 (70.0)
Mean (SD)	2.8 (1.3)	4.8 (0.4)	3.8 (1.4)
You have found strategies to make your work manageable so you can stay at work: n(%)			
Week 8	N=4	N=3	N=7
Disagree	1 (25.0)	0 (0.0)	1 (14.3)
Neutral	0 (0.0)	0 (0.0)	0 (0.0)
Agree	3 (75.0)	3 (100.0)	6 (85.7)
Mean (SD)	4.0 (1.4)	4.7 (0.6)	4.3 (1.1)
Week 16	N=5	N=5	N=10
Disagree	2 (40.0)	0 (0.0)	2 (20.0)
Neutral	1 (20.0)	0 (0.0)	1)10.0)
Agree	2 (40.0)	5 (100.0)	7 (70.0)
Mean (SD)	2.8 (1.3)	4.8 (0.4)	3.8 (1.4)

You are back at work but not sure you can keep up the effort: n(%)			
Week 8	N=4	N=3	N=7
Disagree	2 (50.0)	2 (66.7)	4 (57.1)
Neutral	1 (25.0)	1 (33.3)	2 (28.6)
Agree	1 (25.0)	0 (0.0)	1 (14.3)
Mean (SD)	2.3 (1.5)	2.0 (1.0)	2.1 (1.2)
Week 16	N=5	N=5	N=10
Disagree	4 (80.0)	3 (60.0)	7 (70.0)
Neutral	1 (20.0)	2 (40.0)	3 (30.0)
Agree	0 (0.0)	0 (0.0)	0 (0.0)
Mean (SD)	1.8 (0.8)	2.0 (1.0)	1.9 (0.9)
You worry about having to stop working again due to your injury: n(%)			
Week 8	N=4	N=3	N=6
Disagree	3 (75.0)	3 (100.0)	6 (85.7)
Neutral	1 (25.0)	0 (0.0)	1 (14.3)
Agree	0 (0.0)	0 (0.0)	0 (0.0)
Mean (SD)	1.8 (1.0)	1.7 (0.6)	1.7 (0.8)
Week 16	N=5	N=5	N=10
Disagree	4 (80.0)	3 (60.0)	7 (7.0)
Neutral	1 (20.0)	0 (0.0)	1 (10.0)
Agree	0 (0.0)	2 (40.0)	2 (20.0)
Mean (SD)	1.8 (0.8)	2.6 (1.8)	2.2 (1.4)
You still find yourself struggling to stay at work due to the effects of your injury: n(%)			
Week 8	N=4	N=3	N=7

Disagree	4 (100.0)	3 (100.0)	7 (100.0)
Neutral	0 (0.0)	0 (0.0)	0 (0.0)
Agree	0 (0.0)	0 (0.0)	0 (0.0)
Mean (SD)	1.5 (0.6)	1.7 (0.6)	1.6 (0.5)
Week 16	N=5	N=5	N=10
Disagree	4 (80.0)	2 (40.0)	6 (60.0)
Neutral	1 (20.0)	1 (20.0)	2 (20.0)
Agree	0 (0.0)	2 (40.0)	2 (20.0)
Mean (SD)	2.0 (0.7)	3.0 (1.6)	2.5 (1.3)
You are back at work and it is going well: n(%)			
Week 8	N=4	N=3	N=7
Disagree	0 (0.0)	1 (33.3)	1 (14.3)
Neutral	0 (0.0)	0 (0.0)	0 (0.0)
Agree	4 (100.0)	2 (66.7)	6 (85.7)
Mean (SD)	4.8 (0.5)	4.0 (1.7)	4.4 (1.1)
Week 16	N=5	N=5	N=10
Disagree	0 (0.0)	0 (0.0)	(0.0)
Neutral	0 (0.0)	1 (20.0)	1 (10.0)
Agree	5 (100.0)	4 (80.0)	9 (90.0)
Mean (SD)	4.4 (0.5)	4.6 (0.9)	4.5 (0.7)
You feel you may need help in order to stay at work: n(%)			
Week 8	N=4	N=3	N=7
Disagree	2 (50.0)	2 (66.7)	4 (57.1)
Neutral	2 (50.0)	0 (0.0)	2 (28.6)
Agree	0 (0.0)	1 (33.3)	1 (14.3)

Mean (SD)	2.0 (1.1)	2.7 (2.1)	2.3 (1.5)
Week 16	N=5	N=5	N=10
Disagree	5 (100.0)	2 (40.0)	7 (70.0)
Neutral	0 (0.0)	1 (20.0)	1 (10.0)
Agree	0 (0.0)	2 (40.0)	2 (20.0)
Mean (SD)	1.4 (0.5)	2.8 (1.8)	2.1 (1.4)

Table 95: Returned Questionnaires for participants in the feasibility phase

	Hip (n=10)	Knee (n=16)	Total (n=26)
Replied at, n(%):			
Week 8	8 (88.9)	10 (71.4)	18 (78.3)
Week 16	6 (66.7)	8 (57.1)	14 (60.9)

*Percentages given out of those who were eligible to receive the questionnaires (n=9 and n=14 for hip and knee respectively, at both time points)

Table 96: Workplace participation questionnaire data for the feasibility participants at each time point

	Hip (n=10)	Knee (n=16)	Total (n=26)
Percentage of time lost:			
Baseline	N=9	N=13	N=22
Mean (SD)	36.4 (12.6)	44.8 (18.8)	41.4 (16.7)
Median (Q1, Q3)	40.6 (25, 46.9)	45.8 (28.1, 56.3)	43.2 (25, 50)
(min, max)	(21.9, 50)	(21.9, 71.9)	(21.9, 71.9)
Week 8	N=2	N=3	N=5
Mean (SD)	6.3 (0.0)	34.4 (36.8)	23.1 (30.3)
Median (Q1, Q3)	6.3 (6.3, 6.3)	25.0 (3.1, 75.0)	6.3 (6.3, 25.0)
(min, max)	(6.3, 6.3)	(3.1, 75.0)	(3.1, 75.0)
Week 16	N=3	N=5	N=8
Mean (SD)	10.4 (12.6)	21.9 (13.4)	17.6 (13.6)
Median (Q1, Q3)	3.1 (3.1, 25)	28.1 (18.8, 28.1)	21.9 (3.1, 28.1)
(min, max)	(3.1, 25)	(0, 34.4)	(0, 34.4)

Section 6: Assessment of economic data

Cost of RTW coordinator time
The average hourly cost of £53.24 was based on details of the four RTWCs that were involved in the feasibility work; the cost per working hour (including salary oncosts and overheads) of one band 4 (£29), two band 7 (£53) and one band 8a (£63) RTWCs were incorporated, with each having a qualifications cost added (of £3.38, based on recommendations from PSSRU Unit Costs of Health and Social Care 2018) in order to generate a cost per hour including qualifications.

Cost of RTWC training
The hourly cost of the RTWC trainer was based on the average of the four RTWCs cost per working hour including qualifications (as above).

Cost of printing of the intervention
The £6.37 printing cost of the intervention materials consisted of:

- £4.09 per participant for the patient and employer booklets (based on printers cost of £409 for 100 patient booklets (24 pages) and 100 employer booklets (12 pages) in colour);
- £2.28 per participant for the RTWC workbook/information resource (17 pages) and occupational checklist (13 pages) (based on printers cost of £0.125 per single sided page and £0.145 per double-sided page).

Table 97: Mean resource use, based on all available cases (in relation to your joint replacement)

	Hip (n=10)			Knee (n=16)		
Type of resource use	Mean (SD)	Missing (%)		Mean (SD)	Missing (%)	
GP visits at GP practice						
8 weeks*	0.13 (0.35)	2	20.0%	1.11 (1.17)	7	43.8%
16 weeks	0.00 (0.00)	4	40.0%	0.58 (0.98)	9	56.3%
GP visits at home						
8 weeks	0.13 (0.35)	2	20.0%	0.11 (0.33)	7	43.8%
16 weeks	0.17 (0.41)	4	40.0%	0.00 (0.00)	9	56.3%
Nurse visits at GP practice						
8 weeks	0.57 (0.53)	3	30.0%	0.22 (0.67)	7	43.8%
16 weeks	0.17 (0.41)	4	40.0%	0.00 (0.00)	9	56.3%
Community nurse visits at home						
8 weeks	0.75 (1.04)	2	20.0%	0.22 (0.44)	7	43.8%
16 weeks	0.00 (0.00)	4	40.0%	0.00 (0.00)	9	56.3%
Occupational therapist visits						
8 weeks	0.00 (0.00)	2	20.0%	0.13 (0.35)	8	50.0%
16 weeks	1.00 (2.45)	4	40.0%	0.00 (0.00)	9	56.3%
Physiotherapist visits						
8 weeks	0.88 (1.13)	2	20.0%	4.80 (3.71)	6	37.5%
16 weeks	0.17 (0.41)	4	40.0%	3.71 (3.30)	9	56.3%
Other health service visits						
8 weeks	0.00 (0.00)	2	20.0%	0.00 (0.00)	7	43.8%
16 weeks	0.00 (0.00)	5	50.0%	0.71 (1.25)	9	56.3%
Inpatient nights in hospital						
8 weeks	2.25 (1.39)	2	20.0%	3.00 (1.87)	7	43.8%
16 weeks	1.50 (2.07)	4	40.0%	1.00 (1.41)	8	50.0%
Day case visits to hospital						
8 weeks	0.00 (0.00)	3	30.0%	0.50 (0.71)	6	37.5%
16 weeks	0.00 (0.00)	4	40.0%	0.00 (0.00)	8	50.0%
Outpatient attendances						
8 weeks	0.50 (0.53)	2	20.0%	1.00 (0.50)	7	43.8%
16 weeks	0.17 (0.41)	4	40.0%	0.50 (0.76)	8	50.0%
A&E visits						
8 weeks	0.00 (0.00)	2	20.0%	0.22 (0.67)	7	43.8%
16 weeks	0.33 (0.82)	4	40.0%	0.38 (1.06)	8	50.0%
Physio hospital attendances						
8 weeks	0.63 (0.92)	2	20.0%	4.22 (3.93)	7	43.8%
16 weeks	0.00 (0.00)	4	40.0%	2.88 (3.36)	8	50.0%

* At 8- and 16-week follow-up, participants were asked to record resource use over the past 8 weeks.

Table 98: Mean resource use, based on all available cases (in relation to 'another reason')

	Hip (n=10)			Knee (n=16)		
Type of resource use	Mean (SD)	Missing (%)		Mean (SD)	Missing (%)	
GP visits at GP practice						
8 weeks*	0.00 (0.00)	4	40.0%	0.50 (0.58)	12	75.0%
16 weeks	0.17 (0.41)	4	40.0%	0.86 (0.90)	9	56.3%
GP visits at home						
8 weeks	0.00 (0.00)	4	40.0%	0.20 (0.45)	11	68.8%
16 weeks	0.00 (0.00)	4	40.0%	0.00 (0.00)	8	50.0%
Nurse visits at GP practice						
8 weeks	0.20 (0.45)	5	50.0%	1.50 (2.38)	12	75.0%
16 weeks	1.00 (2.00)	4	40.0%	0.25 (0.71)	8	50.0%
Community nurse visits at home						
8 weeks	0.00 (0.00)	4	40.0%	0.00 (0.00)	12	75.0%
16 weeks	0.00 (0.00)	4	40.0%	0.00 (0.00)	8	50.0%
Occupational therapist visits						
8 weeks	0.00 (0.00)	4	40.0%	0.00 (0.00)	12	75.0%
16 weeks	1.00 (2.45)	4	40.0%	0.00 (0.00)	8	50.0%
Physiotherapist visits						
8 weeks	0.00 (0.00)	4	40.0%	0.00 (0.00)	12	75.0%
16 weeks	0.00 (0.00)	4	40.0%	0.00 (0.00)	8	50.0%
Other health service visits						
8 weeks	0.00 (0.00)	4	40.0%	0.00 (0.00)	12	75.0%
16 weeks	0.00 (0.00)	4	40.0%	0.43 (0.79)	9	56.3%
Inpatient nights in hospital						
8 weeks	0.00 (0.00)	4	40.0%	0.00 (0.00)	12	75.0%
16 weeks	0.00 (0.00)	4	40.0%	0.00 (0.00)	9	56.3%
Day case visits to hospital						
8 weeks	0.00 (0.00)	4	40.0%	0.00 (0.00)	12	75.0%
16 weeks	0.00 (0.00)	4	40.0%	0.00 (0.00)	9	56.3%
Outpatient attendances						
8 weeks	0.00 (0.00)	4	40.0%	0.00 (0.00)	12	75.0%
16 weeks	0.00 (0.00)	4	40.0%	0.43 (0.79)	9	56.3%
A&E visits						
8 weeks	0.00 (0.00)	4	40.0%	0.00 (0.00)	12	75.0%
16 weeks	0.00 (0.00)	4	40.0%	0.14 (0.38)	9	56.3%
Physio hospital attendances						
8 weeks	0.00 (0.00)	4	40.0%	0.00 (0.00)	12	75.0%
16 weeks	0.00 (0.00)	4	40.0%	0.00 (0.00)	9	56.3%

Table 99: Mean (SD) resource use up to 16 weeks follow-up for complete cases (in relation to your joint replacement)

	Hip		Knee	
	N	**Mean (SD)**	**N**	**Mean (SD)**
GP visits at GP practice	6	0.17 (0.41)	5	2.20 (2.39)
GP visits at home	6	0.33 (0.82)	5	0.00 (0.00)
Nurse visits at GP practice	6	0.67 (0.82)	5	0.00 (0.00)
Community nurse visits at home	6	1.00 (1.10)	5	0.00 (0.00)
Occupational therapist visits	6	1.00 (2.45)	5	0.20 (0.45)
Physiotherapist visits	6	0.67 (1.03)	6	11.17 (4.36)
Other health service visits	5	0.00 (0.00)	5	0.60 (1.34)
Inpatient nights in hospital	6	4.00 (2.97)	6	4.17 (3.13)
Day case visits to hospital	5	0.00 (0.00)	7	0.71 (0.76)
Outpatient attendances	6	0.83 (0.75)	6	1.33 (0.82)
A&E visits	6	0.33 (0.82)	6	0.83 (2.04)
Physio hospital attendances	6	0.83 (0.98)	6	7.83 (6.85)

i.e. for each resource item participants with complete data on this resource at 8 and 16 weeks

Table 100: Mean (SD) resource use up to 16 weeks follow-up for complete cases (in relation to 'another reason')

	Hip		Knee	
	N	**Mean (SD)**	**N**	**Mean (SD)**
GP visits at GP practice	4	0.00 (0.00)	2	0.50 (0.71)
GP visits at home	4	0.00 (0.00)	4	0.25 (0.50)
Nurse visits at GP practice	4	0.50 (1.00)	3	2.00 (2.65)
Community nurse visits at home	4	0.00 (0.00)	3	0.00 (0.00)
Occupational therapist visits	4	1.50 (3.00)	3	0.00 (0.00)
Physiotherapist visits	4	0.00 (0.00)	3	0.00 (0.00)
Other health service visits	4	0.00 (0.00)	2	0.50 (0.71)
Inpatient nights in hospital	4	0.00 (0.00)	2	0.00 (0.00)
Day case visits to hospital	4	0.00 (0.00)	2	0.00 (0.00)
Outpatient attendances	4	0.00 (0.00)	2	0.00 (0.00)
A&E visits	4	0.00 (0.00)	2	0.00 (0.00)
Physio hospital attendances	4	0.00 (0.00)	2	0.00 (0.00)

i.e. for each resource item participants with complete data on this resource at 8 and 16 weeks

Table 101: Summary of costs accrued at 8 weeks and 16 weeks (in relation to your joint replacement)

	Hip (n=10)				Knee (n=16)			
	Baseline to 8 weeks		**8 weeks to 16 weeks**		**Baseline to 8 weeks**		**8 weeks to 16 weeks**	
Cost item	**Mean Cost (£) (SD)**	**N**	**Mean Cost (£) (SD)**	**N**	**Mean Cost (£) (SD)**	**N**	**Mean Cost (£) (SD)**	**N**
GP visits at GP practice	4.68 (13.22)	8	0.00 (0.00)	6	41.56 (43.63)	9	21.37 (36.50)	7
GP visits at home	11.70 (33.09)	8	15.60 (38.21)	7	10.40 (31.20)	9	0.00 (0.00)	7
Nurse visits at GP practice	6.20 (5.80)	7	1.81 (4.42)	6	2.41 (7.23)	9	0.00 (0.00)	7
Community nurse visits - home	28.84 (39.80)	8	0.00 (0.00)	6	8.54 (16.96)	9	0.00 (0.00)	7
Occupational therapist visits	0.00 (0.00)	8	47.00 (115.13)	6	5.88 (16.62)	8	0.00 (0.00)	7
Physiotherapist visits	50.10 (64.47)	8	9.54 (23.37)	6	274.83 (212.18)	10	212.66 (189.07)	7
Other health service visits	0.00 (0.00)	8	0.00 (0.00)	5	0.00 (0.00)	9	52.94 (92.90)	7
Inpatient nights in hospital	912.00 (562.90)	8	608.00 (840.52)	6	1216.00 (758.31)	9	405.34 (573.23)	8
Day case visits to hospital	0.00 (0.00)	7	0.00 (0.00)	6	683.46 (966.55)	10	0.00 (0.00)	8
Outpatient attendances	72.76 (77.78)	8	24.25 (59.41)	6	145.52 (72.76)	9	72.76 (110.00)	8
A&E visits	0.00 (0.00)	8	53.44 (130.90)	6	35.63 (106.88)	9	60.12 (170.04)	8
Physio hospital attendances	34.32 (50.30)	8	0.00 (0.00)	6	231.84 (215.79)	9	157.86 (184.32)	8
Total Costs	**1341.54 (427.38)**	**6**	**882.47 (1008.67)**	**5**	**2582.49 (1679.46)**	**7**	**1003.80 (405.34)**	**7**

Table 102: Summary of costs accrued at 8 weeks and 16 weeks (in relation to another reason)

	Hip (n=10)				Knee (n=16)			
	Baseline to 8 weeks		**8 weeks to 16 weeks**		**Baseline to 8 weeks**		**8 weeks to 16 weeks**	
Cost item	**Mean Cost (£) (SD)**	**N**	**Mean Cost (£) (SD)**	**N**	**Mean Cost (£) (SD)**	**N**	**Mean Cost (£) (SD)**	**N**
GP visits at GP practice	0.00 (0.00)	6	6.23 (15.27)	6	18.70 (21.59)	4	32.06 (33.65)	7
GP visits at home	0.00 (0.00)	6	0.00 (0.00)	6	18.72 (41.86)	5	0.00 (0.00)	8
Nurse visits at GP practice	2.17 (4.85)	5	10.85 (21.70)	6	16.28 (25.83)	4	2.71 (7.67)	8
Community nurse visits - home	0.00 (0.00)	6	0.00 (0.00)	6	0.00 (0.00)	4	0.00 (0.00)	8
Occupational therapist visits	50.10 (64.47)	8	47.00 (115.13)	6	274.83 (212.18)	10	0.00 (0.00)	8
Physiotherapist visits	0.00 (0.00)	6	0.00 (0.00)	6	0.00 (0.00)	4	0.00 (0.00)	8
Other health service visits	0.00 (0.00)	6	0.00 (0.00)	6	0.00 (0.00)	4	31.76 (58.31)	7
Inpatient nights in hospital	0.00 (0.00)	6	0.00 (0.00)	6	0.00 (0.00)	4	0.00 (0.00)	7
Day case visits to hospital	0.00 (0.00)	6	0.00 (0.00)	6	0.00 (0.00)	4	0.00 (0.00)	7
Outpatient attendances	0.00 (0.00)	6	0.00 (0.00)	6	0.00 (0.00)	4	53.58 (98.36)	7
A&E visits	0.00 (0.00)	6	0.00 (0.00)	6	0.00 (0.00)	4	22.90 (60.59)	7
Physio hospital attendances	0.00 (0.00)	6	0.00 (0.00)	6	0.00 (0.00)	4	0.00 (0.00)	7
Total Costs	**2.17 (4.85)**	**5**	**64.08 (112.61)**	**6**	**34.98 (24.34)**	**4**	**167.30 (248.76)**	**6**

Table 103: Summary of costs to 16 week follow up for complete cases (in relation to your joint replacement)

Cost Item	Hip		Knee	
	N	Total mean cost £ (SD)	N	Total mean cost £ (SD)
GP visits at GP practice	6	6.23 (15.27)	5	82.28 (89.29)
GP visits at home	6	31.20 (76.42)	5	0.00 (0.00)
Nurse visits at GP practice	6	7.23 (8.86)	5	0.00 (0.00)
Community nurse visits at home	6	38.45 (42.12)	5	0.00 (0.00)
Occupational therapist visits	6	47.00 (115.13)	5	9.40 (21.02)
Physiotherapist visits	6	38.17 (59.13)	6	639.36 (249.35)
Other health service visits	5	0.00 (0.00)	5	44.47 (99.43)
Inpatient nights in hospital	6	1621.34 (1202.42)	6	1688.90 (1266.74)
Day case visits to hospital	5	0.00 (0.00)	7	976.37 (1033.29)
Outpatient attendances	6	121.26 (109.54)	6	194.02 (118.81)
A&E visits	6	53.44 (130.90)	6	133.60 (327.25)
Physio hospital attendances	6	45.76 (53.99)	6	430.13 (376.31)
Occupational health RTW advice	4	0.00 (0.00)	2	18.70 (26.45)
Employer RTW advice	4	0.00 (0.00)	4	23.40 (46.80)

Table 104: Summary of costs to 16 week follow up for complete cases (in relation to 'another reason')

Cost Item	Hip		Knee	
	N	Total mean cost £ (SD)	N	Total mean cost £ (SD)
GP visits at GP practice	4	0.00 (0.00)	2	18.70 (26.45)
GP visits at home	4	0.00 (0.00)	4	23.40 (46.80)
Nurse visits at GP practice	4	5.43 (10.85)	3	21.70 (28.71)
Community nurse visits at home	4	0.00 (0.00)	3	0.00 (0.00)
Occupational therapist visits	4	70.50 (141.00)	3	0.00 (0.00)
Physiotherapist visits	4	0.00 (0.00)	3	0.00 (0.00)
Other health service visits	4	0.00 (0.00)	2	37.06 (52.40)
Inpatient nights in hospital	4	0.00 (0.00)	2	0.00 (0.00)
Day case visits to hospital	4	0.00 (0.00)	2	0.00 (0.00)
Outpatient attendances	4	0.00 (0.00)	2	0.00 (0.00)
A&E visits	4	0.00 (0.00)	2	0.00 (0.00)
Physio hospital attendances	4	0.00 (0.00)	2	0.00 (0.00)

Table 105: EQ-5D questionnaire return rates and missing data

Follow up	Completed EQ-5D		Missing EQ-5D (≥1 dimension missing)	
	Hip (n = 10)	Knee (n = 16)	Hip (n = 10)	Knee (n = 16)
Baseline	10 (100%)	16 (100%)	0 (0%)	0 (0%)
8 weeks	7 (70%)	10 (62.5%)	3 (30%)	6 (37.5%)
16 weeks	6 (60%)	8 (50%)	4 (40%)	8 (50%)

Table 106: Number of missing dimensions for invalid EQ-5D questionnaires

EQ-5D	Hip: Number of missing dimensions					Knee: Number of missing dimensions				
Follow up	1	2	3	4	5	1	2	3	4	5
Baseline	0	0	0	0	0	0	0	0	0	0
8 weeks	0	0	0	0	3	0	0	0	0	6
16 weeks	0	0	0	0	4	0	0	0	0	8

Table 107: Summary of EQ-5D utility scores at each time point (all available cases)

Utility	Hip (n =10)		Knee (n =16)	
Follow up	N	Mean (SD)	N	Mean (SD)
Baseline	10	0.379 (0.226)	16	0.347 (0.296)
8 weeks	7	0.749 (0.155)	10	0.632 (0.238)
16 weeks	6	0.882 (0.144)	8	0.691 (0.107)

Table 108: Summary of EQ-VAS scores at each time point (all available cases)

	Hip			Knee		
	Baseline	8 weeks	16 weeks	Baseline	8 weeks	16 weeks
Mean EQ VAS score (SD)	65.7 (24.7)	81.4 (9.5)	84.8 (13.0)	51.6 (20.0)	70.2 (30.7)	72.5 (17.7)
Median EQ VAS score (IQR)	68.5 (55,90)	80 (70,90)	87 (75,95)	52.5 (37.5,62.5)	77.5 (60,90)	75 (60,85)

Table 109: Proportion reporting EQ-5D-5L levels 1 to 5 by dimension and time point for *hip* replacement patients

EQ-5D scale	Health state Severity*	Hip (n=10)					
		Baseline		8 weeks		16 weeks	
Mobility	Level 1	0	0.0%	5	50.0%	5	50.0%
	Level 2	1	10.0%	0	0.0%	1	10.0%
	Level 3	4	40.0%	2	20.0%	0	0.0%
	Level 4	5	50.0%	0	0.0%	0	0.0%
	Level 5	0	0.0%	0	0.0%	0	0.0%
	Missing	0	0.0%	3	30.0%	4	40.0%
No. reporting any problems		10		2		1	
		100.00%		28.57%		16.67%	
Self-care	Level 1	2	20.0%	4	40.0%	4	40.0%
	Level 2	1	10.0%	2	20.0%	2	20.0%
	Level 3	7	70.0%	1	10.0%	0	0.0%
	Level 4	0	0.0%	0	0.0%	0	0.0%
	Level 5	0	0.0%	0	0.0%	0	0.0%
	Missing	0	0.0%	3	30.0%	4	40.0%
No. reporting any problems		8		3		2	
		80.00%		42.86%		33.33%	
Usual activities	Level 1	0	0.0%	3	30.0%	4	40.0%
	Level 2	1	10.0%	1	10.0%	2	20.0%
	Level 3	6	60.0%	3	30.0%	0	0.0%
	Level 4	2	20.0%	0	0.0%	0	0.0%
	Level 5	1	10.0%	0	0.0%	0	0.0%
	Missing	0	0.0%	3	30.0%	4	40.0%
No. reporting any problems		10		4		2	
		100.00%		57.14%		33.33%	
Pain/ discomfort	Level 1	0	0.0%	1	10.0%	4	40.0%
	Level 2	1	10.0%	4	40.0%	2	20.0%
	Level 3	4	40.0%	2	20.0%	0	0.0%
	Level 4	4	40.0%	0	0.0%	0	0.0%
	Level 5	1	10.0%	0	0.0%	0	0.0%
	Missing	0	0.0%	3	30.0%	4	40.0%
No. reporting any problems		10		6		2	
		100.00%		85.71%		33.33%	
Anxiety/ depression	Level 1	4	40.0%	5	50.0%	6	60.0%
	Level 2	4	40.0%	2	20.0%	0	0.0%
	Level 3	2	20.0%	0	0.0%	0	0.0%
	Level 4	0	0.0%	0	0.0%	0	0.0%
	Level 5	0	0.0%	0	0.0%	0	0.0%
	Missing	0	0.0%	3	30.0%	4	40.0%
No. reporting any problems		6		2		0	
		60.00%		28.57%		0.00%	

* Level 1 - no problems; level 2 – slight problems; level 3 – moderate problems; level 4 – severe problems; level 5 – extreme problems

Table 110: Proportion reporting EQ-5D-5L levels 1 to 5 by dimension and time point for *knee* replacement patients

EQ-5D scale	Health state Severity*	Knee (n=16)					
		Baseline		8 weeks		16 weeks	
Mobility	Level 1	0	0.0%	3	18.8%	1	6.3%
	Level 2	1	6.3%	3	18.8%	2	12.5%
	Level 3	10	62.5%	1	6.3%	5	31.3%
	Level 4	5	31.3%	3	18.8%	0	0.0%
	Level 5	0	0.0%	0	0.0%	0	0.0%
	Missing	0	0.0%	6	37.5%	8	50.0%
No. reporting any problems		16		7		7	
		100.00%		70.00%		87.50%	
Self-care	Level 1	7	43.8%	8	50.0%	6	37.5%
	Level 2	6	37.5%	2	12.5%	2	12.5%
	Level 3	2	12.5%	0	0.0%	0	0.0%
	Level 4	1	6.3%	0	0.0%	0	0.0%
	Level 5	0	0.0%	0	0.0%	0	0.0%
	Missing	0	0.0%	6	37.5%	8	50.0%
No. reporting any problems		9		2		2	
		56.25%		20.00%		25.00%	
Usual activities	Level 1	0	0.0%	1	6.3%	1	6.3%
	Level 2	4	25.0%	5	31.3%	3	18.8%
	Level 3	4	25.0%	1	6.3%	3	18.8%
	Level 4	4	25.0%	3	18.8%	1	6.3%
	Level 5	4	25.0%	0	0.0%	0	0.0%
	Missing	0	0.0%	6	37.5%	8	50.0%
No. reporting any problems		16		9		7	
		100.00%		90.00%		87.50%	
Pain/ discomfort	Level 1	0	0.0%	2	12.5%	1	6.3%
	Level 2	0	0.0%	4	25.0%	4	25.0%
	Level 3	7	43.8%	1	6.3%	3	18.8%
	Level 4	5	31.3%	3	18.8%	0	0.0%
	Level 5	4	25.0%	6	37.5%	0	0.0%
	Missing	0	0.0%	0	0.0%	8	50.0%
No. reporting any problems		16		14		7	
		100.00%		87.50%		87.50%	
Anxiety/ depression	Level 1	8	50.0%	7	43.8%	6	37.5%
	Level 2	4	25.0%	2	12.5%	2	12.5%
	Level 3	3	18.8%	1	6.3%	0	0.0%
	Level 4	1	6.3%	0	0.0%	0	0.0%
	Level 5	0	0.0%	0	0.0%	0	0.0%
	Missing	0	0.0%	6	37.5%	8	50.0%
No. reporting any problems		8		3		2	
		50.00%		30.00%		25.00%	

* Level 1 - no problems; level 2 – slight problems; level 3 – moderate problems; level 4 – severe problems; level 5 – extreme problems