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# Strategies for reducing pain at dressing change in chronic wounds: protocol for a mapping review

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## ABSTRACT

**Introduction** Although pain experienced at dressing change has been reported as the worst aspect of living with chronic wounds, UK guidance for their management is primarily tailored to wound healing and only attends to pain as a secondary consideration. Consequently, there is little up-to-date guidance that specifically addresses how patients, carers and healthcare professionals should manage wound-related pain at dressing change. This mapping review will identify, describe and appraise the existing research evidence for strategies used to assess pain intensity and prevent or alleviate pain at dressing change in chronic wounds. In addition, it will highlight areas for future research and inform the development of up-to-date guidance for healthcare professionals.

**Methods and analysis** We will search MEDLINE and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily (via Ovid SP), Embase (via Ovid SP), Cochrane Central Register of Controlled Trials (via Wiley Cochrane Library), Cumulative Index of Nursing and Allied Health Literature (via EBSCO) and the Web of Science Citation Index Expanded and Social Sciences Citation Index (via Clarivate Analytics). Screening will be undertaken independently by two reviewers, with any disagreements resolved through discussion. Included studies will be subject to coding, using a tested data extraction tool, by two reviewers working independently. The methodological quality of the studies included will be reviewed using quality assessment instruments appropriate for each study design (Cochrane Risk of Bias tool (RoB 2); Risk of Bias in Non-randomised Studies of interventions tool; Critical Appraisal Skills Programme tool). Data will be described narratively and also presented visually in an interactive web-based evidence and gap map.

**Ethics and dissemination** As this mapping review does not collect original data, ethical approval is not applicable. Findings will be disseminated via a written report, an interactive online mapping tool and in peer-reviewed journals and conference presentations.

**PROSPERO registration number** CRD42021260130.

## STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ We are aiming to produce the most comprehensive review of evidence yet published on strategies for reducing pain at dressing change in chronic wounds.
⇒ The results of this review will be reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews statement for reporting items for systematic reviews and meta-analyses.
⇒ We will not be excluding studies based on the language in which they were published.
⇒ There is a possibility that strategies used in practice, but not evaluated, may be omitted from our review.

## INTRODUCTION

In 2017–2018, the National Health Service managed an estimated 3.8 million adults over 18 years of age with a wound, of which 42% were estimated as being chronic wounds.[1] A chronic wound is an open sore in the skin that does not heal, or takes a long time to heal, and frequently recurs.[2] Chronic wounds include pressure ulcers (bed sores) venous (vein-related) leg ulcers and foot ulcers in people who have diabetes.[3] While different chronic wounds may have differing aetiology, symptoms and treatments, all share the need for regular dressing changes, sometimes several times per week.[1 4] Pain associated with chronic wounds is a combination of acute and chronic pain (nociceptive and neuropathic) and dressing change may exacerbate these.[4]

Pain during dressing change has been reported as the worst part of living with a chronic wound,[5] with dressing removal 'the time of greatest pain closely followed by wound cleansing' (p4).[6] A 2008 cross-sectional international survey (n=2018) reported that almost 15% of patients with wounds experienced dressing-related pain 'most of the time' during dressing change, with 17.2% reporting pain 'all of the time' during dressing change (p159).[5] The same study[5] also reported a significant association between certain wound types (venous, mixed and arterial ulcers) and more frequent pain at dressing change; the time for pain to diminish following dressing change ranged from under 1 hour to over 5 hours.

Other studies have highlighted the varied ways in which healthcare professionals seek to measure and minimise patients' pain.[7–12] For example, an Irish study investigated nurses' knowledge of wound management in relation to dressing change and pain (n=100).[12] It found that the most common methods used by nurses to assess wound pain at dressing change were talking generally to the patient and monitoring facial expression respectively.[12] Prescribed analgesia prior to dressing change was the most frequently used method to overcome pain, with soaking old dressings before removal the second most used method.[12] Further work[13–15] echoes the European Wound Management Association's (EWMA's) observation that dried-out dressings, adherent products and gauze are most likely to cause pain and trauma at dressing change, with products such as hydrogels and soft silicone dressings least likely.[6] However, the EWMA also notes that '[s]upporting the surrounding skin during dressing removal' is not prioritised by many healthcare practitioners, despite indications that 'adhesive wound care products … [lead] to skin stripping and potential skin trauma and pain' (p5).[6] This coheres with accounts of 'complacency from healthcare professionals when considering management of pain in people with chronic wounds' (p114)[16] and the resultant 'considerable distress' for patients (p114).[16]

To date, there has been no attempt to systematically appraise and review the literature relating to pain at dressing change for chronic wounds, and this proposed review aims to address this using recognised systematic review conduct guidelines.[17 18] Our primary aim is to identify, describe, map and assess the range of pharmacological (eg, use of pre-emptive analgesic measures) and non-pharmacological interventions (eg, distraction and relaxation techniques) used to assess pain intensity and prevent or alleviate pain at dressing change in chronic wounds. We will outline the measures nurses adopt to assess patients' experience of pain during chronic wound dressing and examine if there are any variations in practice and pain experience that are influenced by wound type or the setting in which care is delivered. We aim, by mapping evidence to all potential interventions, to highlight where further primary research is needed. We also want to create a visual map that provides an overview of the existing evidence to act as a resource to enable relevant evidence to be accessed readily by knowledge users.

## METHODS AND ANALYSIS

This systematic mapping review has been registered with the International Prospective Register of Systematic Reviews[19] and is being undertaken in accordance with the general principles recommended in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews statement.[17] Work commenced on the study in April 2021 and the final report is due in September 2024. This protocol has been drafted with reference to Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols.[18]

### Criteria for study inclusion

#### Population

Adults who are receiving care for a chronic wound. Consistent with Frykberg and Banks' 2015 description of chronic wounds as those 'wounds that fail to proceed through the normal phases of wound healing in an orderly and timely manner' (p561),[20] we are defining chronic wounds as pressure ulcers, venous leg ulcers, arterial ulcers, neurotrophic ulcers and foot ulcers in people with diabetes.

#### Intervention

Must comprise a pain-relief strategy, or strategies, to prevent and/or alleviate acute pain at dressing change for chronic wounds, and measure or report on pain experienced at dressing change. This will include, but not be limited to, choices of dressings, encouragement of the use of analgesics and alternative therapies. We will include any intervention delivered at any point in the dressing change process, including preparation of the patient prior to the dressing change, interventions during dressing change and those delivered at completion of the dressing change.

#### Comparator condition

Patients receiving usual care, placebo or an alternative treatment.

#### Outcomes

The primary outcomes will be: (1) patients' experience of pain and its relationship to both the stage of dressing change (removal, wound preparation, dressing) and the stage of healing, (2) patient-reported pain scores using visual analogue scales, verbal rating scales, numerical rating scales, pictorial rating scales, (3) pain scores from pain questionnaires such as the McGill Pain Questionnaire, Brief Pain Inventory,[21] (4) subjective global rating of pain relief (better/unchanged/worse), (5) summary measures such as sum of pain intensity differences and total pain relief achieved,[22] (6) narrative, behavioural, facial and other expressions. Secondary outcomes will be the use of analgesics and any adverse effects of pain relief strategies for dressing change. While this is not a cost-effectiveness review, any cost data and resource use data that are reported by included studies will also be extracted and summarised.

#### Study type

For this mapping review we will include both systematic review level evidence and primary studies. Eligible primary study designs include comparative study designs, surveys and qualitative evidence that has sought to gather the views and experiences of patients, carers and/or healthcare professionals. Each included study will have reported interventions and strategies to reduce pain associated with dressing change in patients with chronic wounds and have measured pain at dressing change. We will also include a search for grey literature, including PhD theses.

### Search strategy for identification of studies

A comprehensive and systematic search has been conducted for this review. This has comprised a search of major medical, health-related, nursing and allied health professionals and multidisciplinary electronic databases (MEDLINE and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily (via Ovid SP), Embase (via Ovid SP), Cochrane Central Register of Controlled Trials (via Wiley Cochrane Library), Cumulative Index of Nursing and Allied Health Literature (via EBSCO) and the Web of Science Citation Index Expanded and Social Sciences Citation Index (via Clarivate Analytics)). Ongoing trials have been sought from the US National Library of Medicine and the WHO International Clinical Trials Registry Platform. Searches have not been restricted by language, geographical location or date. Where applicable, we will use translation software to translate the title and abstract. If detailed data extraction is needed, we will draw on the support of a wide team of staff fluent in European, South Asian and African languages. If we are unable to successfully complete data extraction we will list the paper and make it clear that it is missing from our analysis and synthesis. The reference lists of included studies will be examined for additional relevant references and, where appropriate, forward citation tracking will be conducted using Web of Science and Google Scholar. Authors will be contacted where additional information is required from publications, and where ongoing trials have been identified. An example of the search strategy for MEDLINE is presented in table 1 and search strategies for other databases are included as online supplemental material S1.

**Table 1** Search Strategy

| # | Searches |
|---|---|
| 1 | exp Foot Ulcer/ |
| 2 | exp Diabetic Foot/ |
| 3 | (diabet* adj3 ulcer*).tw. |
| 4 | (diabet* adj3 (foot or feet)).tw. |
| 5 | (diabet* adj3 wound*).tw. |
| 6 | exp Leg Ulcer/ |
| 7 | ((varicose or venous or leg or stasis or crural or cruris or cruris) adj3 ulcer*).tw. |
| 8 | exp Pressure Ulcer/ |
| 9 | (pressure adj3 (ulcer* or sore* or injur*)).tw,kw. |
| 10 | (decubitus adj3 (ulcer* or sore*)).tw,kw. |
| 11 | (bed next sore* or bedsore).tw,kw. |
| 12 | exp Skin Ulcer/ |
| 13 | ((skin or foot or arterial or neuropathic) adj3 ulcer*).tw. |
| 14 | ((ischaemic or ischemic) adj3 (wound* or ulcer*)).tw. |
| 15 | (chronic adj3 wound*).tw. |
| 16 | (chronic adj3 ulcer*).tw. |
| 17 | r/1–16 |
| 18 | exp Analgesia/ |
| 19 | exp Analgesics/ |
| 20 | exp Analgesics, Opioid/ |
| 21 | pioid*.ti,ab. |
| 22 | exp Anti-Inflammatory Agents, Non-Steroidal/ |
| 23 | (non steroidal anti-inflammator* or nsaid*).tw. |
| 24 | exp Anesthetics, Local/ |
| 25 | ((topical or local) adj3 (anaesthe* or anesthe*)).tw. |
| 26 | ((topical or local) adj3 analges*).tw. |
| 27 | exp Pain/ |
| 28 | pain*.ti,ab. |
| 29 | r/18–28 |
| 30 | exp Wound Healing/ |
| 31 | wound care.mp. |
| 32 | exp Bandages/ |
| 33 | dressing*.mp. |
| 34 | (hydrocolloid* or alginate* or hydrogel* or foam or bead or film* or tulle or gauze or non-adherent or non adherent of silver or honey or matrix or paste*).mp. |
| 35 | r/30–34 |
| 36 | 17 and 29 and 35 |

### Study selection process

Two reviewers (AJK, FC) will screen identified studies (titles, abstracts or full research papers) using EPPI-Reviewer Web (Beta), a cloud-based software programme for literature review data management and analysis. Any disagreements regarding inclusion are subject to discussion between these two reviewers. Reasons for inclusion and exclusion are being recorded and will be outlined in a Preferred Reporting Items for Systematic Reviews and Meta-Analyses flow diagram.

### Quality assessment

We will assess the methodological quality of studies included in the evidence review using quality assessment instruments appropriate for each study design. Version 2 of the Cochrane risk-of-bias tool for randomised trials is a recommended tool to assess the risk of bias in randomised trials and is structured into a fixed set of domains of bias, focussing on different aspects of trial design, conduct and reporting.[23] For non-randomised studies we will apply the ROBINS-I (Risk of Bias In Non-randomised Studies of interventions) tool.[24] The ROBINS-I is a tool developed to assess risk of bias in the results of non-randomised studies that compare health effects of two or more interventions.[24] For other study designs (eg, systematic reviews, cohort studies, case–control studies, qualitative studies) we will apply the appropriate CASP (Critical Appraisal Skills Programme) tool (CASP checklists).[25] Study quality will be assessed by two independent reviewers (AJK, FC) and any disagreements will be resolved through discussion.

### Data extraction

Data describing the details of the intervention and at what stage in the dressing process it was used will be coded. We will also describe how pain was assessed and by whom. Study design and its quality will also be appraised. Any associated factors such as wound type and characteristics which may be relevant to the pain experienced at chronic wound dressing change and associated strategies will also be described. The data will be coded using a data extraction tool that will be designed and tested by the review team and in consultation with stakeholders. Coding of the data will be performed by two reviewers (AJK, FC) working independently. Differences will be resolved by discussion. The process will be managed in Eppi-Reviewer.[26]

### Data synthesis

The data will be described narratively and presented in numerical, tabular and textual format. A coding framework will be created informed by a 'dressing change pathway' that was designed in consultation with stakeholders. This will enable gaps in the evidence base, where strategies in use may have been poorly evaluated. An interactive web-based tool will be used to show the review findings. The matrix will comprise column headings (methods of pain assessment and by whom) and the row headings will represent the interventions. An interactive evidence and gap map will be created using Eppi-Mapper.[27]

### Ethics and dissemination

This mapping review does not collect original data and ethical approval is not applicable. Findings will be disseminated via a written report, an interactive online mapping tool and in peer-reviewed journals and conference presentations.

### Patient and public involvement

Members of our patient and public involvement group have been consulted and involved in the design of this review protocol. In particular, via regular online meetings, patients and their family members have been involved with designing the 'dressing change pathway' and potential interventions to alleviate pain that might be implemented. They have provided expert insights that have shaped our approach to this review and will receive electronic copies of any outputs relating to it.

## CONCLUSION

This systematic review directly responds to calls for academic inquiry to investigate the efficacy of interventions which aim to prevent or reduce pain in chronic wounds at dressing change.[28] Its results will offer an up-to-date overview of both pharmacological and non-pharmacological interventions that have the potential to ease the pain of individuals with chronic wounds at dressing change, and will also outline the range of measures used by healthcare professionals to assess pain at dressing change in this population. A limitation of this approach is the need for regular updating of the review in order to remain useful and relevant. We will be exploring methods to support regular updates of the review during the progress of the review. By conducting what we anticipate will be the most comprehensive exploration of this topic to date, we will present an invaluable synthesis of the extant knowledge in this field.

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**Contributors** FC conceptualised and designed the protocol and is the guarantor of this review. AJK drafted the initial manuscript. AJK, FC, RC, MW and SKB all approved and contributed to the final written manuscript. We thank the members of our PPI group for their invaluable contribution to the study.

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**Competing interests** None declared.

**Patient and public involvement** Patients and/or the public were involved in the design, or conduct, or reporting, or dissemination plans of this research. Refer to the Methods section for further details.

**Patient consent for publication** Not applicable.

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