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LEARNING FROM FACTS

Lessons from the Framework for Appropriate Care Throughout Sheffield (*facts*) project

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- to be an active and vigorous member of the Trent Institute for Health Services Research.

Professor Ron Akehurst, Director

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INTRODUCTION

The aim of the Framework for Appropriate Care Throughout Sheffield (*facts)* project is to create a reproducible, cost-effective and quality controlled framework for changing clinical behaviour across one district (Sheffield) so that:

- the change is based on best evidence from current research findings;
- participants in the change perceive it to be in their interests to co-operate;
- the change reinforces purchasing decisions of both Commissioning Authorities and Fund holders.

The main focus of the project is to ensure that general practices *deliver* effective care. We have chosen focused, clearly defined areas for clinical change to maximise the possibility of success and meaningful evaluation[1]. *facts* is being evaluated using both quantitative and qualitative evaluation methods.

The project has been running for two years. We selected three linked areas as the foci of the change programmes, known collectively as the *Triple A* programme:

Aspirin

to ensure that aspirin is used in secondary prevention by all patients at risk of myocardial infarction or stroke;

Anti-coagulation

to ensure that all patient suffering from atrial fibrillation receive quality controlled anti-coagulation services;

ACE Inhibitors

to improve the treatment of heart failure in general practice by increasing the appropriate use of ACE inhibitors, thereby reducing hospital admissions and mortality rates.

This **Triple A Programme** was selected as being the most suitable area for change because:

- it focuses on a single clinical area of crucial importance, that of Coronary Heart Disease (CHD), which is in line with Health of the Nation targets and of considerable local relevance;

- there is excellent evidence to support the change;
- the rationale and need for the change will be easily understood and appreciated by the Primary Health Care Teams;
- the linked nature of the programme means that savings made in one part of the programme potentially could be used to fund other changes within the same clinical area;
- changes in the number of cardiovascular events and possibly deaths will be large enough to detect at a city-wide level;
- if the change programmes are successful, then the prevalence of CHD nationally will guarantee a high level of applicability elsewhere.

The *facts* team have adopted a multi-faceted approach to implementing clinical change, each programme tailored to local circumstances and the nature of the change itself.

The Aspirin Programme, the first of the change programmes was launched in December 1994, and now has the active participation of 67 of Sheffield's 113 practices. It is now nearing completion. Early results demonstrate that significant change has been achieved. On average, 50% of the target population in each practice had been receiving aspirin before running the programme, this has now risen to 75-80% afterwards.

The project team has an established track record of collaborating with large numbers of Sheffield practices, the health authorities and provider units, but is independent from each of these agencies and is not identified as having vested interests in the provider market. Most members of the team are employed directly by general practices. The project is funded by the Department of Health.

1. INNOVATIVE DEVELOPMENT: GOING BEYOND 'RESEARCH AND DEVELOPMENT'

A lot is known about which treatments work and which do not, much less is known about why. Despite this factual base, professionals frequently fail to take account of the available evidence in their clinical practice. This lack of knowledge about effective ways to change clinical behaviour is a consistent theme in the implementation literature[2,3] and formed one of the starting points for the *facts* project. As the project has developed our ideas have evolved about how widespread changes in clinical behaviour can be achieved. This discussion paper presents some of the theoretical thinking of the *facts* team about the issue of producing widespread clinical change. This model of 'innovative development' is derived from:

- the team's review of the literature on changing behaviour.[4] In particular the non-medical readings have been extremely helpful;[5,6]
- our own experience of identifying which clinical areas to target for change;[7]
- our experience of promoting evidence based care in Sheffield with general practices which have participated in the Aspirin programme;
- initial work on anti-coagulation, which has concentrated on trying to remove the barriers to effective care by ensuring that as the clinical work associated with anti-coagulation shifts from secondary to primary care, appropriate resources follow;
- iterative discussions between the team members and with Gill Musson, the independent evaluator.

The traditional R&D Model

Historically, 'research' and 'development' have been spoken of together almost as if they were a naturally continuous process. This habit is derived from the military and industrial model of innovation which uses research in basic science to ultimately develop products for sale. A good example would be the government sponsored research on radar during the war — the

research was 'developed' thereafter by industry to provide machines which could be sold.

This model was applied widely in the decades after 1945 to the biomedical sciences. It has been most successful, as originally, when applied to producing physical products such as drugs, surgical materials or medical equipment, especially where these are linked to some new product which can be sold.

There are a number of problems with 'R&D' as a universal metaphor for innovation in professional practice, for example:

- 'development' originally referred to the process of actually getting a product to the point of selling it. Its use and implementation thereafter was left to the market. While there is immense effort expended trying to make people buy the particular product, there is relatively little on optimising their behaviour in relation to the innovation itself.

- change in this model is highly dependent on there being both a commercial product and a profit to be made from selling it. Product-less changes (e.g. patient-centred medicine, improved communication skills etc) suffer because there is no 'natural' mechanism to spread them. Profitless innovations either do not get developed (e.g. drugs for tropical diseases) or do not get promoted (e.g. aspirin, stopping ineffective therapies).

- perhaps most important has been the effect that the R&D model has had on our thinking about innovation in medicine. Funding, prestige, academic advance and Nobel prizes are overwhelmingly concentrated on research. Meanwhile 'development' has been until recently a runtish affair that merges with the 'dirty' world of trade (e.g. pharmaceutical firms). Thus, for clinicians, development often becomes enmeshed in other battles with managers who for their part are desperate to actually get some change in what clinicians actually do.

Implementation

Rather late in the day, the clinical professions have begun to develop a more active interest in consciously spreading good practice[8]. Typically, this takes the form of a discussion about 'implementation'. The underlying metaphor here is that there should be an 'implement' (whether sharp or blunt is not clear) which can be used to change the process of medical care, or where necessary, used to hit the relevant professionals over the head. Usually the implement takes the form of a guideline. As with the standard R&D metaphor, far more effort goes into getting the product (the guidelines) presentable than goes into thinking about how to promote and sustain the change in behaviour itself[9]. The potential for guidelines to become implements in the hands of managers and purchasers explains some of the energy which goes into all those mantras which proclaim that 'ownership is all' — since it's so much easier if people use the implements to hit themselves over the head.

Mixed in with the 'blunt instrument' metaphor there is also a widespread 'therapeutic' metaphor that structures our thinking about how to get clinicians to change. Here clinicians who fail to make use of the evidence are unconsciously seen as 'sick' — after all, how else can we explain failure within a model that assumes that change will follow simply from giving rational evidence to rational people? Guidelines, prompts, continuing medical education (CME) interventions or whatever, are the therapeutic interventions we offer in our endeavours to make these 'sick' clinicians better. Failure to respond to the therapies leads on to debates about clinician 'compliance'.

A number of assumptions underlie many models of implementation within health care. These would frequently include the following among them:

- there is some thing or process to be implemented;
- the system to be changed is rational;
- change is about developing new administrative routines;

- implementation is essentially a hierarchical phenomenon; change is agreed or defined and from there flows downward and outwards.

Only the first of these is self-evidently true. The last three reflect assumptions which may have more to do with the world view of managers and doctors in the NHS than with actually achieving change. Much of this world view is reflected in the Rational Goal Model[10], which prizes clear goals and maximised outputs and, in management terms, has been the dominant model underlying the NHS reforms and the 'new public management'[11,12] generally.

Other models make different assumptions about how change may be implemented and this highlights how constricted our thinking can become if we fail to look at the non-health literature. For example:

- front line workers inevitably have priorities which differ from those of top managers. In Elmore's model 'street level' bureaucrats such as receptionists, GPs, teachers and others, exercise a large amount of discretion in how they work[13]. This should not be viewed as a failure of managerial control but as the necessary freedom needed to pace the work, deal with the unexpected, distance themselves from the pressure, etc. Directives and guidelines from above will be systematically ignored unless they help deal with these real world problems as perceived at street level.

- much of the knowledge needed to actually change clinical practice is context-specific and the division between thought and action much more blurred than we like to think. Acting as though there was a 'body of implementation knowledge', that can be ladled into people and then will be valid for all times and all places, is doomed to failure[14].

Alternatives: a possible model for FACTS

So if the traditional route to change — R&D and implementation — is flawed, what other models have we derived and tested in the course of our work with *facts*?

The *facts* team is working in the gap between emerging knowledge and the real world. Typically, this gap, if seen at all, is assumed to be filled with a one -way, 'trickle-down' from research to the real world.

In fact, the situation is more complicated than this. Practitioners managing the real world are often aware of their lack of knowledge and look to the research world for answers. Given that most of their energy is directed towards coping with today's problems, new knowledge tends to be utilised in a haphazard and intermittent way. Similarly, research work always involves the 'real world' if only as a test bed or source for hypotheses, or as variation to be controlled. The situation has traditionally been idealised as in *figure 1*:

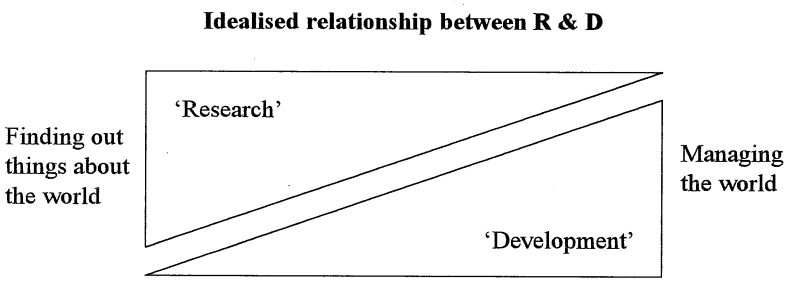


Figure 1. **Idealised relationship between R & D**

The difficulty of making the leap from Research to the world of implementation would suggest that there is a disjunction between these two worlds: there are real barriers which need to be negotiated to achieve an effective exchange between them.

This is the realm that *facts* is exploring:

Traditional ways to try to change professional behaviour have included activities such as audit, CME and contractual obligations/incentives. Guidelines present a more systematic approach to feeding research through to the real world. All too often, however, such approaches are seen simply as 'tools' (implements) which at most need to be evaluated to make sure that they are effective. Looking for 'magic bullets' in this way is unlikely to succeed[15]. The failure of this rational approach to achieve effective change tends to lead to bewilderment about why 'they' do not understand. What happens in reality can often be better represented by *figure 2*:

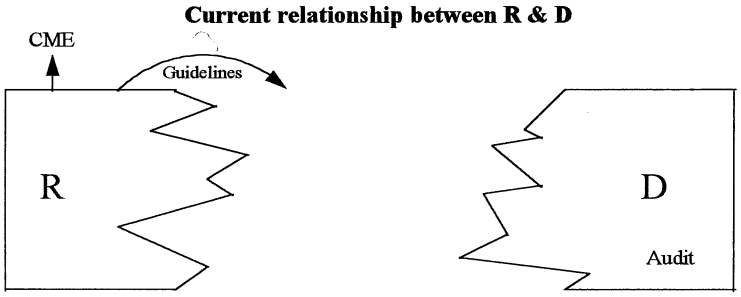


Figure 2. **The current relationship between R & D**

In fact bridging this gap and achieving change is a complex and multifaceted — and essentially practical — task and has always to take into account the local circumstances. A tool that works in one circumstance may have only marginal effect in another. To fill this uncomfortable gap between knowing and doing, the *facts* team have tested out several different approaches represented in *figure 3.*

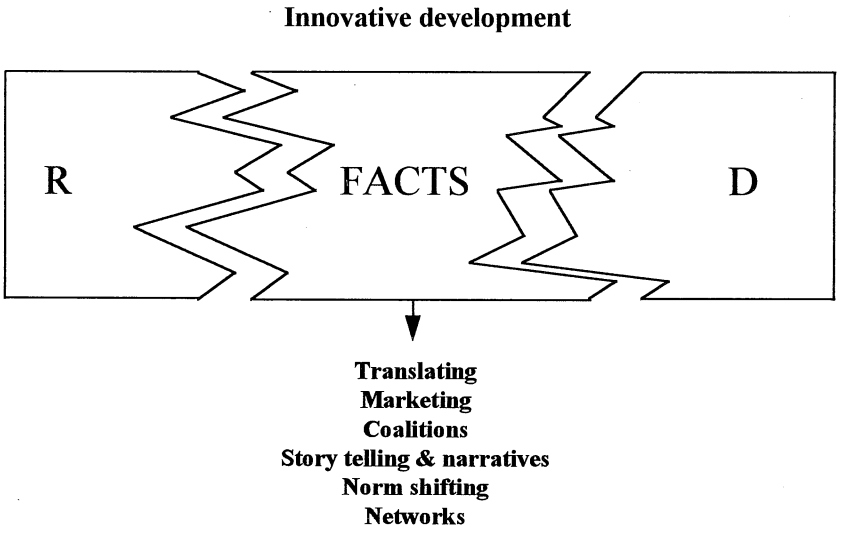


Figure 3. **Innovative development**

Taken as a whole we believe that this paradigm of innovative development will usually include the following elements:

1. Change programmes:

- that are clearly focused;

- that address issues of importance to those who are asked to change;

- that are supported and endorsed by key individuals chosen for their ability to carry their organisations with them[16];

- that use multiple interventions, tailored to overcome difficulties specific to the change[17] and to local circumstance;

- that complement traditional techniques for professional development, such as CME, audit and guidelines;

- that complement contracts and other financial incentives[18];

- that motivate participants by building on their sense of professional pride and taking specific steps to make new group norms explicit.

2. The team promoting the change have:

- trust and credibility with those who are asked to change[5,18];

- independence from other organisational agendas (e.g. making a profit, performance management targets, carrying out research).

3. The processes employed include:

- actively trying to translate between the language and culture of different worlds within the NHS;

- taking care to address the interests of different stakeholders (clinicians, managers, patients etc.);

- promoting change on the basis of agreement;

- active marketing of the change programme;

- constant watchfulness for resistance in each real world situation and finding ways to minimise unforeseen barriers;

- recognising the importance of dealing with non-rational motivations for change. Much of clinical medicine is structured through story-like events - for example clinico-pathological conferences, case presentations, taking a patient's history[19]. Casting desired change in the form of stories and

narratives increases the likelihood that they will be adopted. For example, talking about what is going on locally, and how people have achieved change, is likely to reset group norms much more effectively than quoting rational evidence derived from distant sources[20];

- instituting change beyond the lifetime of the project by integrating it into the real world organisational system;

- generating and empirically testing the assumptions underlying innovative development.

Many of these issues are explored further in this paper.

Changing behaviour is complex but achieving it is not a core function for any existing agency. We hope that, considered as a whole, the idea of 'innovative development' will help others who are engaged in generating widespread change and contribute to the growing understanding about how such complex processes can be fostered.

2. BUILDING COALITIONS FOR CHANGE

One of the fundamental assumptions underlying the *facts* project is that widespread change is most likely to occur when it has the support and endorsement of local coalitions of influential people. This assumption is derived from our background reading[18,19] and the trip of Rosalind Eve to the United States to learn from the experience of the Patient Oriented Research Team in Seattle. The literature has relatively little to say about how to build coalitions or what exactly successful coalition building involves.

This section explains why we give coalition building a high priority; how coalitions differ from consensus or building a sense of 'ownership'; our initial working assumptions about how to build effective coalitions; and what we have learnt so far about this process.

Why are coalitions important for effective change and how does this differ from 'ownership'? Creating widespread and consistent change is not in the gift of any one individual or organisation. In order for change to happen it is usually necessary for several different organisations to act together in concert or, as a minimum, to be aware of the changes of others and not to obstruct them. Several routes to securing such joint action are commonplace.

Bureaucratic or administrative strategies

Administrative strategies are often used when the impulse for change comes from managers or is imposed from above by the government. Typically, a committee or joint working party is set up and procedures, obligations and funding are agreed. Such arrangements tend to work best when agreeing responsibilities between formally-constituted organisations actively engaged on common tasks — an example of such arrangements might be some of the joint purchasing arrangements between health authorities and local social services over care in the community.

The strengths of bureaucratic and administrative strategies include:

- familiarity — such committees are part of everyday life for managers;

- clarity — with luck it is possible to know at the end of such a process what it is that everyone has signed up to;

- clear lines of responsibility — at least in theory.

But this approach also carries disadvantages, such as:

- by their nature such agreements tend to be between managers rather than the people whose behaviour actually has to change. The world (and the literature) is full of examples of well-intentioned agreements between managers of different organisations which fail to be applied in the real world;

- there are numerous ways in which committee members can frustrate agreement being reached or appear to agree but fail to carry their agreement to their home organisation with them;

- they tend to be much less suited to influencing diffuse constellations of organisations (like general practices) than co-ordinating a few hierarchical organisations.

Ownership and guidelines

Within medicine, much effort has gone into trying to achieve widespread change through guidelines. Received wisdom has it that without a sense of 'ownership', guidelines and other such initiatives are likely to fail. Typically, attempts to give a sense of ownership have involved the promoters of a particular change convening meetings with those they wish to influence and encouraging participants to express their opinion about the initiative's acceptability. Guidelines, for example, are frequently promoted by a combination of hospital consultants and public health physicians who endeavour to get others, typically GPs, to 'own' the initiative. This process, while probably improving the chances of successful change to some degree, is time consuming and can only ever reach a minority of GPs.

However, often it is not clear how such efforts achieve 'ownership' — in some studies the target audiences' responses clearly changed subsequent

versions of the guidelines[16] but all too often the consultation exercise is simply about public relations. Nor is it clear how a sense of ownership, once achieved, changes behaviour. As one continuing medical education tutor reported (after the guidelines that he had worked up with the local diabetologist were presented to a group of GPs): 'All they wanted to do was criticise everything, make their mark as it were, and after that they were happy. Having done so they felt better about the guideline — and certainly didn't want anything changed in it — but in the end the guidelines didn't appear to change how they acted anyway'.

Further, our experience of generating city-wide change suggests that in many ways the issue of ownership may be irrelevant. For example, the Aspirin Programme recruited more than 60 per cent of practices in Sheffield and yet has not attempted to foster any sense of 'ownership' around the recommendations it is promoting.

The concept of ownership needs to be examined to understand what is going on here. It is usually used without careful definition and means something like: 'by the end of the communication process the recipient needs to feel some degree of commitment to the proposed change'. Thought of in this way the problem becomes easier to explore: what are the characteristics of communications which are likely to lead to commitment and change? The following seem to be some of the important factors if a particular change is likely to be widely adopted:

- **the provenance of the message** — if the message comes from a trusted and credible source its acceptability is greatly increased[21];
- **congruence with what people know already —** the message is more readily accepted if it is consistent with what the audience already knows[22]. For example, the core message 'high risk people need to be on aspirin' was readily accepted by GPs.

- **loyalty is more important than ownership** — in our programmes we have stressed that this is a local initiative for and by local GPs. Practices have responded well to this approach and quickly understand the advantages of very large numbers of practices all working to the same end. The idea of taking pride, as a community of GPs, in what is done appeals to a profession which often feels undervalued. Measuring the collective achievement, and using its public celebration to argue for more resources for primary care, reinforces the sense of all working together and has obvious potential benefits.

- **visibility is more important than public discussion** — most of the public channels we have used in recruiting have been visual. Newsletters, 'drug stand displays' at Continuing Medical Education (CME) meetings and articles in the GP press are all designed to attract attention without commitment. Individuals who wish to know more have then approached us on their own terms. Public discussion all too often inadvertently engages issues around power and dominance and can actually put many people off a proposal.

- **deal with questions of detail privately** — the public discussion of the aspirin programme has been limited to two brief (<5 minute) presentations by the *facts* project GP adviser, at well attended CME meetings. This has meant that discussion and possible disagreement over the policy has been confined to the relative privacy of presentations at individual practices. This setting is, in our experience, a much more useful way to discuss the real worries people may have about the proposed change than the collective and public debate of detail which characterises traditional attempts to establish ownership.

- **don't try to fool them** — professionals have had an intensive course in discerning which offers of help are genuine and which are merely public relations exercises for someone else's agenda.

Of course, in some ways all the above do aim to give a sense of ownership. Unpacked and laid out in detail, however, it is obvious that achieving a true sense of ownership is a much richer process than having a public discussion of the issues or setting up a working group to develop guidelines.

FACTS coalition strategy

To strengthen the *facts* team's credibility, considerable emphasis was placed, during the preparatory phase, on the development of a coalition of key individuals. This coalition:

- is built around very specific proposals;
- is predicated on the assumption of equality between all the players;
- recognises the need for negotiation and the socially constructed nature of 'change';
- targets particular key individuals known to be influential in their organisations. Formal position is much less important than actual influence;
- requires no formal, collective meetings (see below);
- results in a commitment from the individual to go on the record in support of the change but may ask for no commitment from his or her organisation beyond this;
- depends on knowledge of local networks;
- from the outset, aimed to construct win-win solutions to a particular problem which are likely to include the main agenda items for the individuals themselves.

The *facts* project team recognise that the local context within which efforts to change clinical practice are located is critical to success or failure. In particular change needs to be built around issues that are perceived locally to be important and to have the public support of key people.

To this end the *facts* team carried out extensive discussion to identify the opportunities and barriers presented by the change programmes with members of Sheffield Health Authority and Department of Public Health; the Local Medical Committee; the Department of General Practice; local

Consultants and pivotal GPs (i.e. those GPs who are particularly influential or have a particular interest in the field).

The purpose of such discussions are twofold:

i) to generate local *enthusiasm* and *endorsement* for a predetermined change programme (rather than local *ownership*);

ii) to identify the barriers and opportunities presented by the change programme.

The point here is that the key players are being given the opportunity to influence the *way* in which the change programme is implemented rather than the *content* of the change programme which is evidence-based and therefore not up for negotiation.

Initially, we imagined that we would build coalitions by asking multi-disciplinary groups of influential people to come and discuss a particular change programme. But in discussion with experts in the field (Prof. Steve Soumerai, Harvard, and Prof. Jonathan Lomas, McMaster and Dr Harold Goldberg, University of Washington) Rosalind Eve found that:

a) multi-disciplinary group discussion is often unlikely to be a good starting point for coalition building. Participants in uni-disciplinary group discussion are far more likely to be candid about the obstacles and opportunities for change and less likely to feel the need to defend their own corner in the face of potential professional / organisational rivalries;

b) the strategy adopted by the Patient Oriented Research Team (PORT) in Seattle had been to gain the active commitment of key players by a series of interviews with those known to be influential. Each of these key players had then been asked to suggest other perceived 'opinion leaders' who should be interviewed. Once the interviews stopped revealing new information the PORT team drew them to a close.

As the process of garnering support for *facts* and the Triple A programme continued, we became more and more uneasy about the group discussion approach and increasingly understood the value of the approach adopted by

the Seattle PORT programme. Even if we only invited a single discipline, such as GPs, to discuss a change programme we were concerned that:

- any group of professionals worth its salt would feel obliged to put more energy into disagreeing with one other (or worse, us) than coming to consensus — producing a real danger of the discussion impeding the change programme;

- the event would be a damp squib, with people left with a sense of 'well, what was that all about? They knew what they wanted from us from the start.'

Further, we came to realise that in the process of discussing the change programmes with key people, we were *already* building a very effective coalition of support, since:

- people found it easy to express their real feelings/reservations in relative privacy;

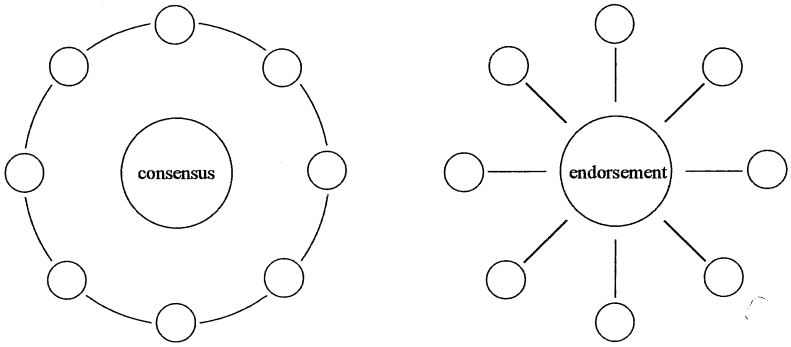
- the change programmes could easily be amended as we went along, to overcome any barriers we identified;

- we were much less likely to get into their 'official' worries or their departmental politics since they felt that we were soliciting only their private opinions;

- the programme could be presented to each person in a way that recognised the cultural and organisational differences that existed and accommodated them;

- we could fit into everyone's very busy schedules.

Reflecting on this experience, we realised we had moved from a model which required us to sit down with all parties at one time and come to consensus (the round table model), to a model which allowed us to meet people individually at different times:



the round table one-to-one

Figure 4 **Coalition Building**

The strengths of the 'one-to one' approach is that:

- the team has more control over the content of the change programme and can therefore ensure that the evidence-based rationale remains intact;
- there are fewer hidden agendas to second-guess and negotiate;
- it is easier to achieve individual commitment and with each endorsement, to build a sense of a collective bandwagon beginning to roll.

But its weaknesses are that:

- people respond in a private capacity. Will this be enough should the going get rough?
- the evidence itself is subject to rather less discussion than it would receive in a large group — making an initial high quality assessment of the evidence all the more necessary (see below).

We will be testing the strengths and weaknesses of this model of coalition building over the coming year.

In considering this approach, it is important to distinguish the process of deciding which change programme to run from the subsequent process of coalition building. The evidential basis for the change, the nett health gain likely from it and the local acceptability were all decided quite separately from the process of coalition building. They were subject to a quite different process which tested out their suitability - was the evidence good? was there local concern about the issue etc. Coalition building then occurred around the programmes themselves and was concerned firstly to make sure that no one violently objected to the proposed change and then to explore the barriers and obstacles as perceived by each player

These thoughts provoked a further model from the team about the nature of informal versus. formal agreements. Change agents typically have little power and few incentives with which to encourage change. Unlike the Health Authority for example, they have few sticks or carrots to bargain with and committees, which are often very effective ways of brokering dependable agreements, are usually rather unreliable when used with multiple small, independent organizations such as general practices. Under these circumstances what is likely to lead to dependable change?:

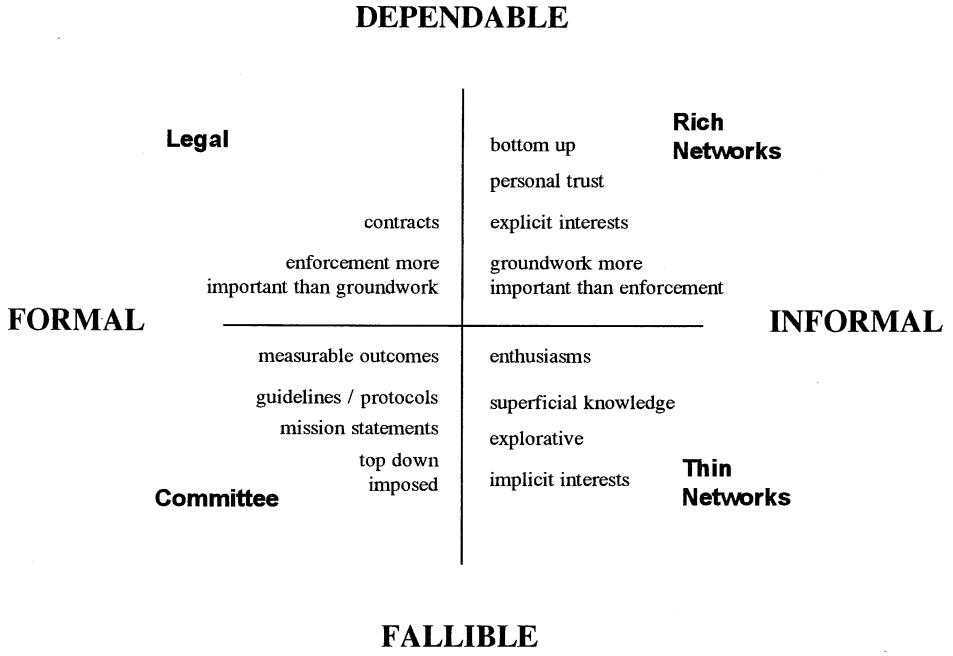


Figure 5 **Generating change across multiple small organisations : What characteristics of agreement predict success?**

Interestingly, the upper right quadrant, where informality is combined with dependability, is the traditional preserve of business where agreements often operate by trust, where there is a rich local network of small businesses, established over long periods of time, that reinforces mutual support and trust and where innovation comes easiest and is valued most. For most contacts *facts* tries to locate itself in the upper right quadrant where general practices, as small businesses, are likely to feel most comfortable and where informal agreement can successfully lead to dependable change.

3. USING MARKETING FOR EVIDENCE-BASED CHANGE

Changing clinical behaviour, by adopting the marketing techniques used by the pharmaceutical industry, is well established in the US[1], and marketing principles are increasingly gaining credibility in this country . Marketing is industry's answer to the problem known as implementation in the health service: in a commercial context it is self-evident that once a product has been successfully developed it needs marketing and selling. The *facts* project has successfully explored the application of a marketing approach in the British context and, in particular, to general practice.

In marketing terms our target audience, or customers, are GPs. The 'product' we are promoting is the Aspirin Programme. Our aim is to gain the commitment and motivation of GPs to pursue a specific course of action. This is what drug company representatives do routinely in general practice. They don't come away from a practice with a firm 'sale' of a tangible product, like a brush salesman might. Instead, they have a somewhat uncertain assessment of the course of action the GP may take next time she or he is confronted with, say, a patient in heart failure.

In order to gain our customers' motivation and commitment we have to engage their interest. The most effective way to do this is to tailor the promotion of the product to fit the needs of the customer. This can only be done with an understanding of the customer's culture, language and professional values. What is it that drives GPs? What factors underpin their clinical decisions? What problems would they like help with?

Initially, these areas need to be understood in general terms. As the motivation and commitment to the product grow, they have to be understood in greater and greater detail so that differences between individual GPs can be discerned, accommodated and built upon.

Preparation

Before their first visit, drug reps learn about their product so they will be able to discuss its pros and cons to the satisfaction of the customer. They put a lot of effort into finding out about the practice they plan to visit. They ask

other reps or local pharmacists what they know about it. They read the firm's records of visits made by previous reps. Is it an academic practice? One that might be keen to audit their work and demonstrate success? Or one primarily motivated by money? Do they want to expand their list size, so might they be interested in developing new services? Do the GPs have a commitment to an extended primary health care team or do they prefer to be a small single-handed practice? In which case, what style of service are they likely to be committed to? Are they fundholders? If so, which of the incentives are likely to be in the forefront of their mind? If they are non-fundholders, how might local hospital and health authority policies affect them? What are the special clinical interests of the partners?

On arrival at the practice, the drug rep will carry out a rapid appraisal. What clinics do they advertise in the waiting room? If they advertise a well women clinic, they'll probably be interested in osteoporosis. If they advertise a well man clinic they may be interested in benign prostatic hypertrophy. The size and presentation of the practice will also give an indication of its organisational capacity. It may be possible to sense whether or not the culture of the organisation is flexible or rigid, open or closed. Do the practice staff appear overworked but happy, or overworked and depressed?

The interview

Once successfully through the door of the consulting room, time is of the essence. While 'reps' aim to have an enormous amount of information in their head, they only expect to draw on a tiny proportion of it. Their intention is to build on the existing enthusiasms, interests and motivations of the customer. The preparation should have helped them to identify some of these. The first few minutes conversation after introduction will continue to build a picture which must be constantly reviewed and reassessed. The GP may have very definite views on a subject, in which case the rep may need to challenge their views before they will consider alternatives. On the other hand, the GP may feel very uncertain and welcome the rep's information to bolster their confidence.

Gaining credibility

The rep then *responds* to the customer. Unlike the academic world, where people like to prove they know a lot about a given subject to gain credibility, the commercial world has a different, more pragmatic approach. Companies want to demonstrate that their product meets the needs of the customer: maybe it will make life easier for them, maybe it will solve a problem. Only the information that will encourage or interest the customer is necessary. The amount may vary widely, depending on the individual GP and their attitude toward drug reps. Some GPs view drug reps as an opportunity for light relief from their very demanding job. Others may value the opportunity to be kept up to date on recent research, albeit with a somewhat partial account. Some may be interested in the "freebies". Others may welcome an audit design that can be implemented immediately and doesn't require any extra thought.

Meeting the customer's needs

A further necessary element of the preparation is to ensure that the rep can indeed offer what the customer wants. Packs are commonly produced, tailored to assist the particular course of action the company wants to promote. Perhaps the pack will include an audit programme or a diagnostic aid - for example, a means to confirm the diagnosis of heart failure. Some are very elaborate, offering educational videos, books and training programmes. To sustain commitment to a particular course of action, GPs may need to be reminded. Prompts and reminders may take a variety of forms. The rep may leave the traditional coasters, mugs and pens or offer to produce tailor-made stationery, to ease the way for the audit that a particular practice wants to do. The GP may not feel that any of these aids is useful - and a good rep will not push them. Nothing is ever insisted upon.

The rep aims to be viewed in a positive light; they want the customer to trust them, to perceive them as there to help, someone who will remove difficulties. In this way, they establish credibility with the GP. In short, they aim to be part of the solution, never part of the problem, to show interest in the customer and to have plenty of action plans[24].

The academic world prides itself on the sophistication of its theoretical understanding — impenetrability is almost a virtue. By contrast, the marketing world prides itself on the ease with which ideas can be grasped and the client's needs met. We believe that marketing techniques have much to offer in the attempt to translate research findings into action. Of course, the danger of this approach is that it can appear to be manipulative or only concerned in promoting a product for profit. Clinicians know all too well that this is what pharmaceutical companies are really interested in. We believe that *facts* can use the undoubted benefits of marketing and still avoid this because the team has no financial interest in the change being promoted and because the project is very much rooted in general practice.

4. MOTIVATING GPs: WORKING AS A CITY-WIDE COMMUNITY

One of the novel aspects of the *facts* project is that it attempts to foster change in clinical behaviour on a city-wide scale rather than focusing on individual clinicians, practices, directorates or trusts. In this section we discuss what we have learnt so far about motivating GPs through the use of this city-wide perspective.

Motivation through larger effects

Focusing on a very large number of practices means:

- that the numbers of patients who may benefit from change can become impressively large. As a practitioner it is much easier to feel enthusiasm for a programme which has a large effect across the city than for the same proposal when the results are limited simply to one's own small practice. Being part of a programme which will prevent 40 deaths and 60 non-fatal Myocardial Infarctions or Cerebrovascular Accidents per year in the city as a whole motivates people more than an equally effective programme limited to a single practice the effect of which will be to prevent one death or two non-fatal events every two years.

- it is possible consciously to build up a bandwagon effect (see below).

Motivation through professional pride

Many GPs currently feel demoralised and under attack. Since the reforms in 1989, they have been under pressure to greatly extend their management role (e.g. purchasing and commissioning) and their clinical role (e.g. health promotion). Inevitably, these changes have meant taking an increased responsibility for the health of whole populations rather than for just the individual patient in front of them. There is a deeply seated assumption, borne out by long term practice, that caring for the individual in front of them is 'core general practice'. By contrast, taking on responsibility for the whole practice population (be it through managing a fund or hitting health promotion targets) is felt by many GPs to be an imposition and a distraction. The reforms however place great emphasis on these new aspects of their

work; in many GPs' eyes this implies an equal and concurrent de-emphasis and, therefore, devaluation of core general practice activity.

The Aspirin Programme has gone some way towards reversing this by deliberately concentrating on a simple clinical topic which is undisputedly a core part of general practice. Helping practices in practical ways to achieve better clinical care makes them feel better about themselves. It may also help to alleviate the suspicion that all the attention on purchasing, targets and the like has distracted GPs from doing the real clinical work that attracted them to general practice in the first place, as well as they might.

Motivation through winning more resources for primary care

It is new for GPs to see themselves as a community of professionals who, when acting together, can achieve demonstrable health gain for a city as a whole. The idea appeals not just because it makes GPs as a group feel better about themselves but also because proven achievements can clearly be used to argue for more resources for primary care.

Do opinion leaders matter in general practice?

One of the unintended consequences of the NHS reforms has been to encourage practices to work with one other. A multiplicity of fora have sprung up from fund holding consortia and locality commissioning agencies through to initiatives like the Towards Co-ordinated Practice project and the Healthy Eastenders project.

To encourage such inter-practice collaboration is complex[25]. To date, most collaboration has concentrated on purchasing issues, mutual support or health promotion. There has been little work specifically to promote consistent changes in clinical behaviour in multiple practices — apart from the proliferation of guidelines with often lamentably deficient implementation. Such discussion as does occur usually focuses on opinion leaders. But most of the work citing opinion leaders as important in changing professional behaviour comes from the US[26,27], where primary care physicians have attending rights to local hospitals where they frequently consult with or just happen to meet colleagues, from both secondary and primary care. British GPs are much more isolated, which means that:

- their sense of what is appropriate professional behaviour is rarely tested against colleagues;

- historically, British GPs have seen themselves (and have been seen) as a scattered network of idiosyncratic little islands. There is no hierarchy, nor even much collectivity, and anyone who wishes to influence this loose and disparate group of organisations has little choice but to build laborious links with each individual practice;

- GPs do see some colleagues as 'influential' but the evidence on which they base this judgement is usually extremely thin;

- the opportunities for opinion leaders to exercise leadership are comparatively rare.

At the start of the Aspirin Programme we sought consciously to use our knowledge of the local networks of practices to ensure a good uptake. We interviewed a number of people whom we felt were opinion leaders in general practice with two aims. First, to find out what they thought about the Triple A programme and to identify barriers and opportunities; and second, if possible, to recruit them to the programme.

Our expectation from the literature was that the views of these opinion leaders might be used (with their consent) to recruit other practices. To this end, we gathered endorsements from some of them and arranged to video their practices taking part in the programme. In fact, none of this proved necessary. Practices have been eager to be recruited and have taken little note of whether a particular 'opinion leader' is involved or not. This has remained true even with the increased numbers of practices involved with the aspirin programme (currently 68 out 114).

Getting a bandwagon rolling

Success may breed success, but only if it is visible for all to see. We have adopted several ways to promote and share success: newsletters, feedback on how each particular practice is doing with implementation and press releases to the national GP journals. A photo album of participating practices is a low-key, but tangible, way to make visible exactly who is taking part.

Celebrating success and paying attention to the worries and aspirations of participants are all ways of building the bandwagon effect. Certainly it is true to say that whilst GPs have been spectacularly uninterested in *who* else is taking part, they are often visibly impressed when told *how many* practices are participating.

It is also true to say that people can be motivated to take part through a sense of guilt. Using this is probably only effective in a minor way — not many people want to join a bandwagon of guilt. However it may be useful to use guilt to *stop* practices doing things which are bad practice.

5. TRANSLATING BETWEEN CULTURES

Achieving widespread change usually requires action from several organisations.

These organisations differ from each other not only in terms of goals, but also because they have different internal cultures and norms. This section explores the idea that the ability of the project team to navigate and translate between these different cultures is fundamental to securing city-wide change. It aims to explain why the project team needs to be able to understand and interpret the major cultures which the project spans and to act effectively where difficulties in these inter-cultural encounters might occur. Our principal experience of translation, thus far, is between the worlds of general practice and health commissions.

There are various aspects of the cultures of general practice and health authorities which have to be considered:

Communication

- Language both allows and expresses cultural difference. But language can be problematic in relationships between cultures because meaning is not fixed; often common terms can have different meanings in different cultures. For example, the word 'research' could conjure up images of a randomised controlled trial of a new drug to those schooled in the medical world, whereas 'research' to those in the time-pressured world of health commissions may mean something more akin to gathering background information. Another simple example is the word 'long'. Anyone's understanding of the words 'a long meeting' are dependent on their own experience of meetings. If most of your meetings last half an hour, one lasting an hour is a long meeting. In general practice, the vast majority of meetings are those that happen in quick succession in the consulting room, lasting between 5 and 15 minutes. So the general practice idea of 'a long meeting' might be one lasting about two hours, say. Whereas meetings lasting two hours are a commonplace within Health Commissions. 'Audit', 'collaboration', 'budget', 'consensus', even 'management' are all words whose meaning is likely to be highly context-

specific and will conjure up quite different connotations in the minds of those from different organisations and/or professions.

- Some terms are seen as more or less central to different cultures. The same term may carry different weights in different cultures, or it may be the prerogative of one particular group. The term 'clinical decision', for example, might be seen as properly belonging to medical discourse, and is clearly unproblematic for doctors. Managers however often find the term difficult - 'Is this 'clinical decision' really out of my proper realm of activity or am I being ambushed again by claims to a spurious medical autonomy?'

- Routine styles of communication may be distinct in the different cultures. Health Commissions are used to dealing with written communications which are long, they tend to include as much information as they can — Executive Letters for example. But GPs are more accustomed to reading much shorter texts — patients' notes and test results. Similarly, Health Commission staff are likely to be accustomed to the routine of long discursive meetings, whereas GPs are steeped in the interactive style of short, intense consultations. These differences in communication styles can lead to friction because experiences and expectations differ.

Differences in the meaning and weight of language are not usually made explicit, or even necessarily recognised, within each culture. In dialogue between the cultures, the meanings and weights of different terms are assumed to be the same. They are rarely discussed. This can lead to misinterpretations which result in error and confusion. Attempts to overcome such problems then frequently have to entail lengthy direct discussion between the parties, which can be very time consuming, and in themselves are antithetical to GP culture.

Decision making

Decision making style and content vary between the different cultures in several dimensions:

- Health Commission staff are more likely to make infrequent, big, definite and irreversible decisions than are GPs. Their decisions are likely to be

more wide ranging and to impact on a greater number of people than do individual clinical decisions. GPs, on the other hand, make very many small decisions*, usually relating to the individual in front of them and frequently couched in terms of uncertainty — 'let's do this and see how things are in a couple of weeks'.

- Health Commission decisions are often based on quantitative evidence. For example, financial statements and epidemiological trends are viewed as sources of certain and reliable information. By contrast, a large proportion of GP decision making relies heavily on information given by the patient in the consultation, which is often vague and uncertain.

- The social and emotional context of decisions is very different in the two cultures. GPs typically make clinical decisions 'on the spot', during a consultation, and without the possibility of lengthy discussion with colleagues or others. In the Health Commission, it is expected that important decisions will hardly ever be made in this way, but will require discussion, consultation and multiple viewpoints to be taken into account.

In general terms, GPs are used to making more 'grey area' non-routine decisions, based on relatively ambiguous and uncertain information, but these decisions and their consequences are likely to impact on far fewer people than those made in Health Authorities.

Structures and values

Different organisational structures embody different values[28]. The structures of the two cultures, and the values and basic assumptions embodied in them, differ in certain important ways:

- Health Commissions are large hierarchical organisations, and the structure reflects an emphasis on the occupation of roles as well as the completion of tasks. Like most large organisations they are inevitably bound by some rules and regulations which structure their work, and by

* If each consultation involves an average of 3 decisions (what's wrong? what shall I do? when does the patient need to come back?) then a typical GP usually takes in excess of 15,000 clinical decisions per year.

the much larger institutional context of which they are a part. They exist within a given NHS structure which determines to a large extent what they can do and how they can do it.

- By contrast, general practices are not only small organisations, but they are also demand-led small businesses. The result is that GPs can and do organise themselves and their practices in functionally quite different ways, and with different emphases on different aspects of general practice. They are less institutionally rule-bound than their health authority counterparts. The structure is less fixed and more flexible. The implication is that a degree of organisational and cultural diversity exists in general practice, which means that to talk in general terms about general practice can be misleading. Individuals tend to be 'function-led' rather than 'system-led'. This in turn means there is a strong focus on autonomy in general practice culture, and reaction to anything which might threaten that autonomy is likely to be equally strong.

- Health authorities are concerned primarily with promoting the health of populations whereas general practice focuses on individual medicine. At times - especially in debates about how clinicians use resources - there can be considerable tension between the value of general practitioner as advocate and the equally legitimate values of delivering cost-effective care to whole populations that are espoused by health authorities.

Although the focus of general practice has been drawn more towards population medicine in recent years, individual medicine remains the primary focal point. The work of health authorities, on the other hand, and the values embodied in that work, are firmly rooted in population medicine.

- most GPs would consider themselves clinicians first and managers second. Their professional values reflect this, and indeed their professional identity rests to some extent on their right to self management. Health authorities, however, are largely made up of managerial rather than clinical professions. These different professions can embody different views on appropriate health care provision and delivery.

The different cultures reflect different organisational identities and different professional values, each of which has its own particular language and ways of organising. Unless these are carefully negotiated and made explicit when appropriate, misunderstandings and mistrust can lead to entrenchment and impede the progress of a multi-agency change.

The *facts* team is multi-disciplinary with a range of experiences of different agencies. Our knowledge of the culture, language and motivations of each of the agencies is used to translate between the different worlds. This knowledge is consciously updated. We were helped to learn from three 'shadowing' exercises, between health authority managers and GPs. Shadowing is also a good way to experience the reality - as opposed to the reported rhetoric - of another's world.

Conscious translation has meant that the *facts* team has often been able to dispense with the need for direct contact between players — something which is not feasible when endeavouring to change city-wide GP behaviour. Successful translation also increases credibility - 'these people talk my kind of language'- within both worlds.

In this section we have begun to identify the ways in which health authority and general practice cultures differ. We do not want to suggest that the list of factors is definitive, but we do wish to stress that the differences which we have identified, if left unattended, will inhibit the success of any inter-cultural project such as *facts*. In short, the project team must have the ability to navigate between cultures.

We have limited this discussion to translating between health authorities and general practice because these are central to the aims of the *facts* project. But we are aware that the cultures of other agencies and sections of the medical profession also need to be navigated and translated during the course of a project which aims to put effectiveness research into practice — for example, hospitals, universities and Continuing Medical Education organisations.

6. CONCLUSIONS

The good news from *facts* is that it is possible to motivate very large numbers of practices to participate in co-ordinated, evidence-based changes in clinical care. Such participation can be achieved without any financial or resource incentives to practices and be promoted by a relatively small (2.5 WTE) team of people. The project team believe they have gone some way towards identifying essential attributes of such change programmes.

The bad news is that there are no magic bullets, no quick-fit tool boxes packed with nifty tricks to achieve this. Instead there is the much more complicated business of listening to people, solving the real world problems they tell you are inhibiting them and inspiring them to change. Multi-faceted programmes built around these principles, tailored to specific purposes, fitted to particular circumstances and purveyed by agencies capable of building trust and credibility are likely to generate real change. In the process such programmes tend to increase both professional satisfaction and the likelihood of future co-operation.

As health care becomes more complex and as clinical and institutional agendas churn ever faster, understanding how to create agencies capable of delivering such change becomes more and more crucial.

APPENDIX 1

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REFERENCES

1. Lomas J. Teaching old (and not so old) docs new tricks: effective ways to implement research findings In:- Dunn E, Norton P, Stewart M, Tudiver F, Bass M. (eds) *Disseminating research / changing practice.* London: Sage Publications Inc, 1994:1-18.

2. Haines A, Jones R. Implementing findings of research. *BMJ* 1994;308(4): 1488-1492.

3. Grimshaw J, Russell I. Achieving health gain through clinical guidelines II: ensuring guidelines change clinical practice. *Quality in Health Care* 1994; 3:45-53.

4. Eve R, Hodgkin P, Golton I, Munro J, Musson G. *The FACTS project : progress report.* Sheffield:FACTS Project,1994.10-15.

5. Tidd J. *The diffusion of innovation and technology transfer : a review and research agenda.* London: University of Science, Technology and Medicine,1995.

6. King N, Innovation at work : the research literature In:- West M, Farr J. (eds) Innovation and Creativity at Work.Chichester:John Wiley & Sons.),1990;15-59.

7. Hodgkin P; *The FACTS project : choice of change programmes background research.* Sheffield: FACTS project,1994.

8. Implementing clinical practice guidelines. *Effective Health Care Bulletin* 1994;1(8).

9. Eddy D. *A manual for assessing health practices and designing practice policies.* Philadelphia: American College of Physicians, 1995.

10. Quinn R. A meta-model of organisational cultures quoted In:-Raine JW, Willson MJ 'Managing criminal justice'. London; Harvester Wheatsheaf, 1993;74.

11. Hood C. A public management for all seasons? *Public Administration* 1991; 69:3-19.

12. Dunleavy P. The globalization of public services production : can government be "best in world"? *Public Policy and Administration* 1994; 9(2):36-64.

13. Elmore R. Organisational models of social programme implementation *Public Policy* 1978; 26;186-228.

14. Blackler F. *Knowledge and the theory of organisations: organisations as activity systems and the reframing of management* Lancaster: University of Lancaster,1992.

15. Oxman A, Thomson M, Davis D, Haynes R. No magic bullets. *Canadian Medical Association Journal* 1995;153(10):1423-31

16. Degeling P, Apthorpe R. *Can intersectoral co-operation be organised? : uncovering some implications of 'sectors' in calls for 'intersectoral' co-operation* Sydney: University of New South Wales, 1992.

17. Thomson R, Lavender M, Madhok R. How to ensure guidelines are effective. *BMJ* 1995; 311:237-42.

18. Evans R. The dog in the night-time : medical practice variations and health policy In:- Andersen T, Mooney G. (eds). *The challenges of medical practice variations* London: Macmillan, 1990.

19. Greer A. The state of the art vs the state of the science; *International Journal of Technology Assessment in Health Care* 1988;4:5-26.

20. Tanenbaum S. Knowing and acting in medical practice: the epistemological politics of outcomes research *Journal of Health Politics, Policy and Law* 1994;19(1): 27-44.

21. Armstrong D, Tatford P, Fry J, Armstrong P. Development of clinical guidelines in a health district : an attempt to find consensus. *Quality in Health Care* 1992;1:241-4.

22. Cousins J, Leithwood K. 'Enhancing knowledge utilization as a strategy for school improvement'. *Knowledge: Creation, Diffusion, Utilization* 1993; 14(5) 305-333. (quoted in Tidd J. Ref 5)

23. Soumerai S, Avorn J. Principles of educational research ('academic detailing') to improve clinical decision making. *JAMA* 1990;263(4):549-554.

24. Dickinson E. Using marketing principles for health care development. *Quality in Health Care* 1995;4:40-44.

25. Harping G, Walton P. *Bluff your way in marketing*. Horsham: Ravette Books, 1987.

26. Eve R. Collaborative practice. In:- G Meade. (ed). *A primary care led NHS : putting it into practice.* Edinburgh: Churchill Livingstone, 1996.

27. Lomas J, Enkin M, Anderson G, Hannah W, Naydon E, Singer J. Opinion leaders vs audit and feedback to implement practice guidelines. *JAMA* 1991;265(17):2202-6.

28. Engeström Y. Developing thinking at the changing workplace : towards a redefinition of expertise. San Diego: Laboratory of Comparative Human Cognition, University of California, 1989.

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