

Getting research findings into practice

Making better use of research findings

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This is the first in a series of eight articles analysing the gap between research and practice

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There is increasing interest in implementing research findings in practice both because of a growing awareness of the gap between clinical practice and the findings of research and also because of the need to show that public investment in research results in benefits for patients. Improved understanding of the reasons for the uptake of research findings requires insights from a range of disciplines. In order to promote the uptake of research findings it is necessary to identify potential barriers to implementation and to develop strategies to overcome them. Specific interventions that can be used to promote change in practice include using clinical guidelines and computerised decision support systems, developing educational programmes, communicating research findings to patients, and developing strategies for organisational change.

Interest in how best to promote the uptake of research findings has been fuelled by a number of factors including the well documented disparities between clinical practice and research evidence of effective interventions. Examples include interventions in the management of cardiac failure, secondary prevention of heart disease,¹ atrial fibrillation,² menorrhagia,³ and pregnancy and childbirth.⁴ In the United Kingdom the advent of the NHS research and development programme has led to greater involvement of NHS personnel in setting priorities⁵ and to the establishment of a programme to evaluate different methods of promoting the implementation of research findings.⁶ The concept of pay back on research⁷ has also been developed, resulting in a framework that can be used to assess the benefits arising from research.

Relying on the passive diffusion of information to keep health professionals' knowledge up to date is doomed to failure in a global environment in which about 2 million articles on medical issues are published annually.⁸ There is also growing awareness that conventional continuing education activities, such as conferences and courses, which focus largely on the passive acquisition of knowledge have little impact on the behaviour of health professionals.⁹ The circulation of guidelines without an implementation strategy is also unlikely to result in changes in practice.¹⁰

Health professionals need to plan for rapid changes in knowledge, something that is likely to persist throughout our professional lifetimes and which encompasses not only diagnostic techniques, drug treatment, behavioural interventions, and surgical procedures but also ways of delivering and organising health services and developing health policy. Many health professionals already feel overburdened, and therefore a radical change in approach is required so that they can manage change rather than feel like its victims. A number of steps are necessary in order to support this process.

Summary points

Reasons for failing to get research findings into practice are many and include the lack of appropriate information at the point of decision making and social, organisational, and institutional barriers to change

All people within an organisation who will have to implement the change or who can influence change should be involved in developing strategies for change

Better links between clinical audit, continuing education, and research and development need to be developed

Evidence of the effectiveness of specific interventions to promote change is still incomplete, but a combination of interventions will probably be needed

The pressure for more effective and efficient implementation of research findings is likely to grow

Keeping abreast of new knowledge

Health professionals need timely, valid, and relevant information to be available at the point of decision making. Despite extensive investment in information technology by the NHS the rapid delivery of such information is not widely available. Relatively simple prompting and reminder systems can improve clinicians' performance¹¹; the price of useful databases such as *Best Evidence* (which comprises *Evidence-Based Medicine* and the American College of Physicians Journal Club on CD ROM) and *The Cochrane Library* is little more than the cost of subscribing to a journal. There are an increasing number of journals, such as *Evidence-Based Medicine*, that review important papers rigorously and present the results in a way that busy clinicians can rapidly absorb. The NHS reviews and dissemination centre in York compiles systematic reviews that are relevant to clinicians and policy-makers. Nevertheless, many clinicians still do not receive such information,¹² and more needs to be done to provide a wider range of high quality information that is usable in practice settings.

Librarians' roles are changing rapidly; in North America, for example, some librarians are involved in clinical practice through programmes such as literature attached to the chart (LATCH).¹³ In these programmes, hospital librarians participate in ward rounds and actively support clinical decision making at the bedside. Requests for information are documented

in the notes, and articles are subsequently delivered to the ward. Similar programmes could be introduced elsewhere after appropriate evaluation, but information support is also needed in primary care settings. In the United Kingdom many health professionals, such as nurses, may not be permitted to use their hospital library since they are not formally affiliated with the (medical) body that funds them.

Implementing knowledge

Research findings can influence decisions at many levels—in caring for individual patients, in developing practice guidelines, in commissioning health care, in developing prevention and health promotion strategies, in developing policy, in designing educational programmes, and in performing clinical audit—but only if clinicians know how to translate knowledge into action. The acquisition of database searching and critical appraisal skills should give health professionals greater confidence in finding and assessing the quality of publications, but this does not necessarily help in applying new knowledge to day to day problems.¹⁴ Much attention has been paid to the use of best evidence during consultations with individual patients—that is, using evidence based medicine derived largely from epidemiological methods.^{15 16} However, organisational change is often also necessary to implement clinical change. Even a step as simple as ensuring that all patients with a history of myocardial infarction are offered aspirin requires that a number of smaller steps are taken including identifying patients, contacting them, explaining the rationale, checking for contraindications, and prescribing aspirin or advising patients to buy it over the counter. Furthermore, health professionals have their own experiences, beliefs, and perceptions about appropriate practice; attempts to change practice which ignore these factors are unlikely to succeed. Awareness of these pitfalls has led to greater emphasis on understanding social, behavioural, and organisational factors which may act as barriers to change.¹⁷

A wide spectrum of approaches for promoting implementation has been used. These approaches are underpinned by a number of theoretical perspectives on behavioural change such as cognitive theories which focus on rational information seeking and decision making; management theories which emphasise organisational conditions needed to improve care; learning theories which lead to behavioural approaches involving, for example, audit and feedback and reminder systems; and social influence theories which focus on understanding and using the social environment to promote and reinforce change.¹⁸

Clearly these approaches are not mutually exclusive. For example, the transmission of information from research to single practitioners or small groups of health professionals through educational outreach has a strong educational component but might also include aspects of social influence interventions¹⁹ in pointing out the use of a particular treatment by local colleagues. The marketing strategies used by the pharmaceutical industry depend on segmentation of the target audience into groups that are likely to share characteristics so that a message can be tailored to that



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group.²⁰ Similar techniques might be adapted for non-commercial use within the NHS. The evidence for the effectiveness of different approaches and interventions is still incomplete and will be reviewed in a subsequent article in the series.²¹ In many cases a combination of approaches will be more effective than a single intervention.²² No single theoretical perspective has been adequately validated to guide the choice of implementation strategies.

The study of the diffusion of innovations—how new ideas are transmitted through social networks—has been influential in illustrating that those who adopt new ideas early tend to differ in a number of ways from those who adopt the ideas later. For example, those who adopt new ideas early tend to have more extensive social and professional networks.²³ Much of the medical literature has a bias towards innovation and the underlying assumption is that innovations are bound to be beneficial. However, in health care the challenge is to promote the uptake of innovations that have been shown to be effective, to delay the spread of those that have not yet been shown to be effective, and to prevent the uptake of ineffective innovations.²⁴

Steps in promoting the uptake of research findings

- Determine that there is an appreciable gap between research findings and practice
- Define the appropriate message (for example, the information to be used)
- Decide which processes need to be altered
- Involve the key players (for example those people who will implement change or who are in a position to influence change)
- Identify the barriers to change and decide how to overcome them
- Decide on specific interventions to promote change (for example the use of guidelines or educational programmes)
- Identify levers for change—that is, existing mechanisms which can be used to promote change (for example, financial incentives to attend educational programmes or placing appropriate questions in professional examinations)
- Determine whether practice has changed in the way desired; use clinical audit to monitor change

Important characteristics of the message**Content**

- Validity
- Generalisability (settings in which the intervention is relevant)
- Applicability (the patients to whom the intervention is relevant)
- Scope
- Format and presentation (for example, will there be written or computerised guidelines, will absolute and relative risk reductions be presented)

Other characteristics

- Source of the message (for example, professional organisation, Department of Health)
- Channels of communication (how the message will be disseminated)
- Target audiences (the recipients)
- Timing of the initial launch and frequency of updating
- Mechanism for updating the message

Although different people can promote the uptake of research findings—including policymakers, commissioning authorities, educators, and provider managers—it is largely clinicians and their patients who will implement findings. A number of steps need to be taken in order to get research findings into practice (box previous page). The characteristics of the message should also be considered; they may influence the degree to which the message is incorporated into practice (box above).

The choice of key players—those people in the organisation who will have to implement change or who can influence change—will depend on the processes to be changed; in primary care, for example, nurses and administrative staff should be involved in many cases, in addition to general practitioners, since their cooperation will be essential for organisational change to be effective. If the innovation involves the acquisition of specific skills, such as training in certain procedures, then those who organise postgraduate and continuing education are also key players.

The identification of barriers to change and the development of strategies to overcome them are likely to be of fundamental importance in promoting the uptake of research findings. Some examples of barriers to the application of research findings to patients are given in the box on the next page. A future article will propose a conceptual framework for analysing and overcoming barriers.²⁵ Since some of the strongest resistance to change may be related to the experiences and beliefs of health professionals, the early involvement of key players is essential in identifying and, when necessary, overcoming such impediments to change. Barriers need to be reviewed during the process of implementation as their nature may change over time.

Interventions to promote change must be tailored to the problem, audience, and the resources available. Educational outreach, for example, may be particularly appropriate for updating primary care practitioners in the management of specific conditions because they tend to work alone or in small groups. Guidelines based on research evidence may be developed and endorsed by national professional organisations and adapted for local use as part of clinical audit and educational programmes.

Linking research with practice

There need to be closer links between research and practice, so that research is relevant to practitioners' needs and so that practitioners are willing to participate in research. While there is evidence that some researchers can promote their own work,²⁶ in general researchers have not been systematically involved in the implementation of their own findings and may not be well equipped to do this. In the United Kingdom, the NHS research and development programme is seeking views about priorities for research through a broad consultation process.⁵ Better methods of involving those who are most likely to use the results of research are needed to ensure that research questions are framed appropriately and tested in relevant contexts using interventions that can be replicated in everyday practice. For example, there is little point conducting trials of a new intervention in hospital practice if virtually all of the treatments for a particular disorder are carried out in primary care settings. Contextual relevance is particularly important in studies of the organisation and delivery of services,²⁷ such as stroke units, hospital at home schemes, and schemes for improving hospital discharge procedures to reduce readmissions among elderly patients. If unaccounted for, differences in skill mix and management structures between innovative services and most providers can make it difficult for providers to have a clear view of how they should best implement findings in their own units.

Interaction between purchasers and providers—In the NHS, purchasers as well as providers should be involved in applying research findings to practice. Purchasers can help create an environment conducive to change, for example, by ensuring that health professionals have access to information, that libraries are financially supported, and that continuing education and audit programmes are configured to work together to promote effective practice. Purchasers could also ensure that the organisation and delivery of services takes into account the best available research evidence. However, it is clear that the degree of influence exerted by purchasers on the practice of providers is limited,²⁸ and that priority must be given to helping providers develop the capacity to understand and use research findings.

Making implementation an integral part of training—For many health professionals, involvement in implementation may be far more relevant to their careers and to the development of the NHS than undertaking laboratory research, yet pressures to undertake research remain strong. Greater encouragement should be given to clinicians to spend time learning to use and implement research findings effectively.

Conclusion

Learning to evaluate and use research findings in daily practice is an important and lifelong part of professional development. This requires not only changes in educational programmes, but also a realignment of institutions so that management structures can support changes in knowledge and the implementation of changes in procedures.

There are major structural difficulties that need to be overcome in the NHS. For example, better coordination at national, regional, and local levels is required between the education and training of health professionals, clinical audit, and research and development. This type of coordination should be a priority for the proposed national institute for clinical excellence in the United Kingdom.²⁹

It has been suggested that financial considerations, rather than the potential for gaining useful knowledge, affect general practitioners' choice of continuing education courses.³⁰ One of the aims of continuing education should be to ensure that practitioners stay up to date with research findings of major importance for patient care and change their practice accordingly. Continuing education activities need to take into account evidence about the ineffectiveness of many traditional approaches. To develop a more integrated approach to promoting the uptake of research findings, health systems need to have coordinated mechanisms that can manage the continuing evolution of medical knowledge.

The advent of research based information that is available to patients³¹ and the increasing accessibility of information of variable quality through the internet and other sources suggests that doctors have the potential to act as information brokers and interpreters for patients. Doctors could also work together with user groups representing patients or their carers, a number of which have demonstrated an interest in and commitment to providing quality research based information to their members.³² The pace of change in knowledge is unlikely to slow. As health systems around the world struggle to reconcile change with limited resources and rising expectations, pressure to implement research findings more effectively and efficiently is bound to grow.

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Potential barriers to change

Environmental

In the practice

- Limitations of time
- Limitations of the organisation of the practice (for example, a lack of disease registers or mechanisms to monitor repeat prescribing)

In education

- Inappropriate continuing education and failure to connect with programmes to promote better quality of care
- Lack of incentives to participate in effective educational activities

In health care

- Lack of financial resources
- Lack of defined practice populations
- Health policies which promote ineffective or unproved activities
- Failure to provide practitioners with access to appropriate information

In society

- Influence of the media on patients in creating demands or beliefs
- Impact of disadvantage on patients' access to care

Personal

Factors associated with the practitioner

- Obsolete knowledge
- Influence of opinion leaders (such as health professionals whose views influence their peers)
- Beliefs and attitudes (for example, a previous adverse experience of innovation)

Factors associated with the patient

- Demands for care
- Perceptions or cultural beliefs about appropriate care

Factors which in some circumstances might be perceived as barriers to change can also be levers for change. For example, patients may influence practitioners' behaviour towards clinically effective practice by requesting interventions that have been proved to be effective. Practitioners might be influenced positively by opinion leaders.

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