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Evidence-based medicine and the implementation gap

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ABSTRACT Evidence-based medicine was one of the earliest manifestations of evidence-based policy and practice, and has exercised substantial influence on other policy areas. Based on data from seven empirical studies carried out between 1993 and 1999, this article examines the origins and impact of EBM, and the complexities of implementation which have emerged. Policy makers and EBM enthusiasts alike have frequently taken a somewhat simplistic view of the implementation gap they seek to address. Understanding clinicians’ mixed reactions to the rhetoric of EBM helps explain both why EBM has had as much impact as it has, and why it has sometimes been resisted and rejected. Although other areas of public policy can learn from the experience of EBM, there are distinctive features of health care which set it apart, notably the continued autonomy and dominance of the medical profession and the strong influence of the biomedical science model on what is considered legitimate evidence.

KEYWORDS change management; evidence-based medicine; implementation; professional autonomy

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Introduction

Evidence-based policy and practice are now in vogue across a wide range of government departments and academic disciplines, including education, social care, management and criminology (Davies et al., 1999; Black, 2001). Evidence-based medicine (EBM) was one of the first manifestations of this preoccupation and has exercised enormous influence, both within health care and across policy more generally. This article seeks to explore reasons
for the emergence and impact of EBM, and to understand some of the
factors which have affected its uptake, drawing on a suite of seven empirical
studies carried out by the authors during the mid- to late 1990s, comprising
over 1400 interviews plus observation, and documentary analyses
(Ferlie et al., 2001; Dopson et al., 2002).

Early assumptions that the case for EBM would be self-evident and that
it would spread automatically and quickly have had to be revised as the
complexities of implementation have been acknowledged. Although there
is much that we can learn from the experience of EBM that applies equally
to other areas of public policy, there are a number of distinctive features
of health care which set it apart, notably the continued autonomy and domi-
nance of the medical profession and the strong influence of the biomedical
science model on what is considered legitimate evidence.

What is EBM?

It is argued that EBM represents a paradigm shift, from medical practice
based on the accumulation of clinical observation, expertise and experience
towards one characterized by a systematic search for rigorous and relevant
scientific evidence (Evidence-Based Medicine Working Group, 1992).

Figure 1 contrasts the components of the so-called ‘new’ paradigm with the
‘old’ paradigm.

Davidoff and colleagues are among many writers who seek to identify
the components of an evidence-based approach. They identify five linked
ideas as central to EBM:

Firstly, clinical decisions should be based on the best available scientific evidence;
secondly, the clinical problem – rather than habits or protocols – should
determine the type of evidence to be sought; thirdly, identifying the best evidence
means using epidemiological and biostatistical ways of thinking; fourthly,
conclusions derived from identifying and critically appraising evidence are useful
only if put into action in managing patients or making health care decisions; and,
finally, performance should be constantly evaluated. (Davidoff et al., 1995: 1085)

A key underlying assumption of EBM is that not all evidence is equival-
ent. There is a hierarchy of study design in terms of the strength they
provide. Leading the list is the randomized control trial (RCT); non-
randomized controlled studies and case studies occupy a lower position in
the hierarchy. The systematic reviews carried out by the Cochrane
Collaboration seek to draw together evidence from all rigorously conducted
trials on a particular topic, so that practice is not based simply on the results
of one trial.

EBM has sometimes been criticized for reducing clinical practice to
‘cook-book medicine’, following a recipe rather than exercising clinical
judgement. However, Sackett and colleagues seek to demonstrate how
external research evidence should support clinical judgement, rather than
replace it. EBM, they argue, is:
the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients. It requires a bottom up approach that integrates the best external evidence with individual clinical expertise and patients' choice. External clinical evidence can inform, but can never replace, individual clinical expertise, and it is this expertise that decides whether external evidence applies to the individual patient at all and, if so, how it should be integrated into a clinical decision. (Sackett et al., 1996: 71)

Evidence-based medicine, they continue:

... is not restricted to randomised trials and meta-analyses. It involves tracking down the best external evidence with which to answer our clinical questions. It is when asking questions about therapy that we should try to avoid the non-experimental approaches, since these routinely lead to false positive conclusions about efficacy. Because the randomised trial, and especially the systematic review of several randomised trials, is so much more likely to inform us and so much less likely to mislead us, it has become the 'gold standard' for judging whether a treatment does more good than harm. If no randomised trial has been carried out for our patient's predicament, we must follow the trail to the next best external evidence and work from there. (Sackett et al., 1996: 71)
The rationale for evidence-based medicine - the gap between research and practice

Problems in translating evidence into clinical practice are not new. An early example of delayed uptake of innovations is the use of lemon juice to prevent scurvy. James Lancaster demonstrated its effectiveness in 1601, but it was not until 1747 that James Lind repeated the experiment, and the British Navy did not fully adopt the innovation until 1795 and, in the case of the merchant marines, 1865 (Mosteller, 1981).

In recent decades medical research has dramatically increased the amount of evidence and range of treatment options available. Despite this rapid growth in what medical technology and research can offer, the medical literature is littered with examples of research findings that have not found timely acceptance in practice. Indeed, the proliferation of new medical knowledge and techniques is precisely one reason why clinical practice is characterized by substantial variations, as practitioners struggle to keep abreast of advances.

The problem has been succinctly described by Lomas and Haynes.

In an ideal world, there would be no gap between what is known from sound research . . . and the means actually employed by health care practitioners in administering care to their patients. In fact, however, there is a distressing distance between health care knowledge in general and the practices of individual clinicians for most validated health care procedures. (Lomas and Haynes, 1988: 77)

The emergence of the evidence-based medicine movement

The evidence-based medicine movement emerged as a response to these unacceptable variations in practice and failure to act on available evidence. The landmark book in 1971 by British epidemiologist Archibald Cochrane entitled Effectiveness and efficiency: Random reflections on health services proved to be an important catalyst (Cochrane, 1971). Cochrane set out a case for the greater use of scientific techniques in health services research as a way of achieving greater effectiveness and efficiency in patient care. He put forward two major steps. First, policy makers need to ‘measure the effect of a particular medical action in altering the natural history of a particular disease for the better’, usually in the context of a randomized control trial (RCT), set up to determine the difference between a group with a given disease who are randomly assigned to a particular intervention and groups who are either given a standard treatment or no treatment at all. This step Cochrane defined as effectiveness. Second, personnel and resources needed to be applied optimally in achieving clinical effectiveness, resulting in efficiency. Throughout his book, Cochrane illustrates how care could be improved in a number of clinical areas, by using positive results from clinical trials to define practice.
Cochrane advocated setting up a new organization to assess independently and compare medical research. This took another two decades to achieve. In the meantime, individual research groups pioneered the approach he had outlined, notably a team in Oxford reviewing the evidence for effective care in pregnancy and childbirth (Chalmers et al., 1989). In the foreword to this book, Cochrane himself described the study as ‘a real milestone in the history of randomized trials and in the evaluation of care’, and suggested other specialties should copy the methods used.

Cochrane’s proposed independent research evaluation body was eventually set up in 1993 in Oxford with the launch of the international Cochrane Collaboration, which has executed systematic reviews of the medical evidence. Since the launch, hundreds of systematic reviews have been completed. Oxford is also home to the Centre for Evidence-Based Medicine at the John Radcliffe Hospital, for many years led by David Sackett, an American physician. Sackett and the Centre have played a major role in spreading understanding of EBM and providing practical help in applying it, and in providing a focus for an enthusiastic group of doctors from the UK and other countries, especially North America, to exchange ideas.

Interest from policy makers

The emergence of EBM was thus largely professionally driven, although it took some time to become generally accepted and has not been uncontested within the medical profession, a point to which we return later. Over time, politicians, managers and commissioners in both the USA and the UK began to take an interest in EBM and to see it as the key to changing clinical practice and improving health care quality. They therefore began to seek ways to increase its uptake. In the UK these efforts have included projects to draft treatment guidelines for specific conditions and a number of demonstration projects designed to change clinical practice in line with evidence. These were to generate lessons to be disseminated to the wider NHS (Dopson et al., 1999; Locock et al., 1999). New systems and organizations have been set up, devoted to the evaluation and dissemination of clinical evidence, such as the NHS Health Technology Assessment Programme, the NHS Centre for Reviews and Dissemination and the National Institute for Clinical Excellence.

Evidence-based medicine is also at the forefront of policy decisions in the health care systems of Europe and North America (Woolf et al., 1999). Searches on Medline carried out in 2000 (Chambers, 2000) found just one US article about evidence-based medicine in 1995 and 1996, compared with a total of 294 over the next two years and roughly the same number for 1999 and 2000. In 1997, the Agency for Health Care Policy Research (now the Agency for Health Care Research and Quality), established 12 evidence-based practice centres around the USA intended to provide
There are a number of possible explanations for policy makers’ interest in EBM; one explanation is a genuine wish to improve the quality and consistency of care for patients. Alternatively, or in addition, different stakeholders will have their own agenda, priorities and views about the potential value of EBM.

Politicians, managers and economists may see EBM as a method of cutting costs while preserving standards of care, or as a way of justifying rationing decisions. Weisbrod (1991) has argued that health care consumer demand has only relatively recently increased to the point where strict attention to resource allocation is needed and that advances in medical technology have increased pressure on resources. EBM offers a means of ensuring maximally effective care, and of discarding ineffective practices and techniques, thereby making cost savings. Newer techniques may be less invasive and produce better outcomes, requiring shorter hospital stays and fewer follow-ups. The idea that EBM is a way of cutting costs is firmly rejected by its advocates among the medical profession, however, who argue raising the standard of practice may lead to increased expenditure (Sackett et al., 1996).

Managers may also perceive EBM as a vehicle for increased control of doctors. Clinical autonomy and medical professional dominance have proved highly resistant to managerial and political intervention (Freidson, 1989; Wolinsky, 1993; Harrison, 1999). EBM may be seen as a way of moving away from medicine as a mysterious art form to one which can be codified, standardized and made transparent. Klein suggests that: ‘... the new scientism appears to offer politicians less pain, less responsibility for taking difficult decisions and a legitimate way of curbing what are often seen as the idiosyncratic and extravagant practices of doctors’ (Klein, 1996: 85).

Politicians view EBM as a lever through which to improve the population’s perception of health services, to rally support for their political party and appeal to voters. There has been growing awareness of the need to improve accountability and demonstrate that public money is being spent wisely to the benefit of patients. The tying in of evidence-based medicine with ‘New Labour’ visions of an improved NHS is a good example of the political use of EBM. The government White Paper The new NHS (Secretary of State, 1997) signalled the use of EBM as a way to improve standards of care for all citizens, and to respond to a number of high-profile malpractice scandals.

While the engagement of policy makers may increase the profile of EBM and perhaps increase its influence and uptake, the shift away from a purely professionally driven movement towards a policy initiative may be something of a double-edged sword. The medical profession may react against the hijacking of EBM by managerial and political concerns that they mistrust, a question to which we return later.
Can EBM bridge the implementation gap?

The idea of an implementation deficit or gap between what is planned and what is actually achieved has a long-standing place in the analysis of public policy (Pressman and Wildavsky, 1973; A lford, 1975), and in organizational studies of the diffusion of innovations (Rogers, 1995; Van de Ven et al., 1999). In both fields it has long been argued that it is wrong to assume change will be smooth, straightforward and linear. Rather we can expect a negotiated process, in which resistance and challenge play an inevitable part. As Hogwood and Gunn suggest: ‘Implementation must involve a process of interaction between organizations, the members of which may have different values, perspectives, and priorities from one another, and from those advocating the policy’ (Hogwood and Gunn, 1984: 208). This will be especially true in a professionalized organization such as the NHS, in which interactions between different professional subgroups within each organization are just as important as relations between organizations.

EBM represents something of a paradox. Ironically it has been assumed that evidence-based ways of thinking and behaving would diffuse in a linear and rational way, even in the face of clear empirical evidence that diffusion of specific pieces of research evidence was not happening in that way. Yet paradoxically, despite this being precisely the problem that led to the need for EBM, policy makers and EBM enthusiasts alike have frequently taken a somewhat simplistic view of the implementation gap that they aim to address. Its advocates have sometimes been surprised at the degree of resistance to something which seems to them both self-evidently good and worthwhile, and also entirely consistent with the ‘scientific’ biomedical paradigm within which they operate. Our argument here is that EBM has failed to take account of the complex multi-dimensional nature of the implementation gap it faces.

For some time it was assumed that the implementation gap between research evidence and practice was a technical one of information availability – if information could be disseminated more efficiently, in a digestible form, changes in practice would automatically follow. Commentaries on EBM routinely draw attention to factors such as information overload, the gap in skills needed to interpret research and the need to invest in better, usually electronic, sources of evidence. It has become clear that reliance on passive diffusion of information to keep health professionals up-to-date is doomed to failure in a global environment in which around two million articles on medical issues are published annually (M ulrow, 1994). Early pioneers of EBM therefore targeted their efforts at ensuring information was more readily accessible, for example in the form of guidelines and summaries of recent publications. Reviews of primary research have been provided by the Cochrane library, the NHS Centre for Reviews and Dissemination and the Health Technology Assessment Programme, among others. (These and other data sources are usefully...
reviewed in Gray (2001: Appendix 1), and are the heart of the nascent National Electronic Library for Health, which is designed to make it easier to access such evidence.)

However, although this has undoubtedly been important, EBM is not simply about getting specific pieces of research evidence into practice. It is about creating a culture where practitioners automatically think in an ‘evidence’-based way every time they see a new case, where it becomes instinctive to seek out research evidence and base treatment decisions on that evidence. Gradually, as it became apparent that this wider cultural change was frequently failing to take root at local level, it was realized that more complex organizational and behavioural obstacles existed, and that ensuring information was readily available was necessary but certainly not sufficient (NHS Centre for Reviews and Dissemination, 1999).

Drawing on Aristotelian analysis of rhetoric, Van de Ven and Schomaker (2002) argue that EBM has thus far concentrated on only one aspect of rhetorical persuasion, namely logos – the clarity and logic of the argument and its supporting evidence. Effective rhetoric, however, also relies on pathos – the power to stir the emotions, beliefs, values, knowledge and imagination of the audience and generate empathy, and ethos – the credibility, legitimacy and authority of the speaker (Barnes, 1995). Van de Ven and Schomaker conclude:

To be successful at this mission, proponents of EBM must, as Aristotle exhorts, have the ability to reason logically, understand human character and goodness in their various forms so as to be a creditable witness, and understand human emotions so as to better appreciate the beliefs and experiences of others. (Van de Ven and Schomaker, 2002: 91)

The individual and collective reactions of doctors themselves to the rhetoric of EBM are thus crucial in understanding its impact. These reactions have been mixed, and have changed over time; analysis of medicine’s response helps explain both why EBM has had as much impact as it has, and why it has sometimes been resisted and rejected. This brings us to the heart of medicine’s image of itself and of its scientific basis, relations within the profession, the perennial question of power and autonomy and the profession’s relations with managers, policy makers and other professionals. These factors are considered below, incorporating empirical evidence from a suite of studies carried out by the authors during the 1990s (Ferlie et al., 2001; Dopson et al., 2002).

Although the emphasis in what follows is on the problems and barriers that EBM has faced, it would be entirely wrong to imply it had had no effect. Of all the different versions of evidence-based policy and practice in different disciplines, EBM has undoubtedly been one of the most successful (Davies et al., 1999). Because the change in attitudes towards it and its impact on policy have been gradual, it is easy to forget just how radical it seemed in its early days. Over the 10 years since our research in this field
began, EBM has evolved from a contested minority pursuit to a new orthodoxy - at least outwardly. Nonetheless, although the principle of EBM has largely been accepted, practice still does not necessarily reflect this - it is the reasons for this continuing discrepancy between what doctors say, what they think and what they actually do that we seek to understand.

**Peer influence, art and science**

The degree of influence that EBM has enjoyed so far can be attributed largely to two factors. One is the fact that it was largely professionally driven in its early stages - although it has since been taken up by policy makers and managers - and the other factor is EBM's appeal to a biomedical scientific agenda.

Given all the evidence that doctors respond most readily to peer influence, peer comparison and peer example (Hiss et al., 1978; Mittman et al., 1992; West et al., 1999; Locock et al., 2001), professional leadership has - in the end - been one of EBM's major strengths. In general our suite of studies found widespread support for the application of EBM as redefined by Sackett, as illustrated by this quotation from an Associate Advisor in general practice: 'David Sackett defused a lot of criticism very well by defining EBM as a bottom up approach based on good clinical management and supported by the best available evidence and taking into account patient priorities' (Fitzgerald et al., 1999: 20).

Support in principle for EBM did not necessarily mean it was being applied in day-to-day practice, however, as one GP described:

> There should be EBM. Most of the things I do, I try to think of a reason why I am doing it, though I am not able to recall the evidence or where it has come from. I have a faint memory or I have read something and I obviously can't remember where I have read them. (Dawson et al., 1998: 20)

From the same study, a registrar commented: 'We are just too busy to be able to stop on a ward round and discuss evidence-based medicine for every patient - it's inappropriate. Nice in principle but difficult to do in practice' (Dawson et al., 1998: 22).

Despite current acceptance of the idea, early resistance was often more overtly hostile. Our research in the late 1990s revealed apocryphal stories of deep resentment towards the leaders of the EBM movement. A sardonic medical clinical director put it: 'We're creating an industry to worship the great god [of evidence-based medicine]' (Clinical Standards Advisory Group, 1998: 55). Pioneers of EBM were sometimes heavily criticized by other doctors threatened by the challenge to their established practice, and for a while were operating too far beyond the norms of some of their colleagues to gain widespread credibility and acceptance. Most doctors are unlikely to be persuaded while the message is seen to come from a few mavericks.
I go to the occasional academic meeting but the trouble with those is that you get speakers who tend to have a hobby horse and although briefly you can believe what they are saying, on the whole it fades away within a few days unless it is backed up by genuine numbers of other people saying the same thing. (Consultant interviewee, Wood et al., 1998: 24)

One common group of negative reactions argued that medical care had always been evidence-based, and that EBM was therefore neither new nor necessary. Indeed, it was perceived as insulting to be told that one’s practice was not evidence-based – this despite all the research demonstrating variations in practice and failure to act on new evidence. This reaction can be partly understood by exploring different understandings of the word ‘evidence’, as illustrated by the following quotation from a medical director and consultant respectively:

Published articles are usually contentious. You need a forum to discuss them, to gather information, to dissect them, to say ‘it works OK in a teaching hospital, but would it work here in a DGH?’, to ask whether they’ll stand the test of time . . . What gets me is our practice has always been based on evidence - I don’t just get out of bed in the morning and look out of the window and think ‘what shall I do today?’ - but it’s practical evidence, based on knowing what’s happening, not on working it out statistically. (Locock et al., 1999: 29)

We all practice EBM because we collect our evidence from different sources and apply our own filter to produce the best answer. We may get it slightly wrong, but I don’t honestly believe we get it any more wrong than relying on published data. (Dawson et al., 1998: 21)

This is further borne out by the work of Fairhurst and Huby (1998) examining how GPs negotiate the implementation of evidence. The authors identify a distinction between ‘trial data’ – the pure scientific research findings – and ‘practical knowledge’. GPs make judgements about the meaning and applicability of trial data in the context of other sources of evidence, including their own experience, the advice of respected hospital colleagues and local norms of practice. From this emerges a form of practical, applied knowledge.

The focus on alternative forms of evidence has led to a more subtle critique of EBM. While accepting that medicine has not always been based on research evidence and that EBM is indeed a new and necessary way of looking at things, this critique suggests that EBM has an overly rigid and reductionist emphasis on scientific evidence as the primary determinant of clinical practice.

This reaction throws light on the perennial tension between medicine as art or craft, and medicine as science (Hunter, 1996). EBM is entirely consonant with – and a product of – the biomedical model and therefore holds a powerful attraction to doctors trained in that model. A s Klein says, ‘who, after all, can be against science? . . . Who can do anything but welcome the prospect of weeding out interventions that appear to be based on faith and
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... tradition rather than evidence?’ (Klein, 1996: 85). Williamson (1992) and Hunter (1996) argue that the arrival of EBM may serve to reinforce the long-standing hierarchical distinction between the quantifiable and measurable facts of research evidence and the ‘mere knowledge’ of clinical practice, which draws on an anecdotal and unscientific evidence base.

Yet doctors are also conscious of the complexity and uncertainty of much medical decision making, the heterogeneity of patients, the importance of other factors such as socio-economic circumstances and co-morbidity and the difficulty of extrapolating research results to the wider population and to different local contexts. One consultant argued:

I think it is a complete hoax personally... trials are done on such specific, clean questions but they never quite apply to the patient in front of you... I think that is the problem with practice at my level – it is very individual. That is why I don’t agree with EBM: there isn’t any evidence to help you deal with the difficult patient. (Dawson et al., 1998: 21)

The ‘imposition of a spurious rationality on a sometimes inherently irrational process’ (McKee and Clarke, 1995: 101), is seen to undervalue medicine’s more holistic and empathic side, in which judgement, experience and skill play an important part. The appeal to logic and science may fail if the rhetoric does not also engage with deeply held values and beliefs. A clinical nurse specialist put it, ‘You don’t win on the basis of evidence, but on the basis of emotion. Until we address the emotional component of scientific – or pseudo-scientific – judgements, we won’t achieve change’ (Locock et al., 1999: 29).

Goodman argues that ‘EBM is in danger of becoming a new and unchallengeable orthodoxy following its own political agenda’ (2000: 224); although its aim was to challenge the ‘opinionated dogma of the expert’ with something more rational, it risks creating a new source of dogma which may be resented by its target audience and fails to acknowledge the realities of daily clinical practice. As Armstrong suggests: ‘A tension... emerges between the maintenance of the autonomy of the profession as a collectivity through the promotion of a therapeutic rationality and the maintenance of the autonomy of the individual practitioner through the rhetoric of patient-centredness’ (Armstrong, 2002: 1771).

Inevitably, however, the idea of a dichotomy between art and science is too simplistic. Klein suggests that ‘like all evangelists, the enthusiasts for the new scientism are occasionally carried away by their sense of mission. But like all good scientists, they are also careful to stress that scientific knowledge can only be one input in decision-making’ (Klein, 1996: 85). Sackett’s own definition cited towards the beginning of this article clearly allows for different kinds of information to influence clinical decisions, not just research evidence. The problem is one of perception and emphasis more than real content. In trying to shift the balance more in favour of the scientific side, EBM has sometimes been perceived as going too far and
stressing science to the exclusion of all else. EBM is only likely to be accepted by doctors if they feel confident that it embraces both the scientific and more craft-based aspects of medical identity.

Professional power and managerial control

Despite successive attempts by managers, civil servants and politicians to constrain medical power, doctors retain a striking degree of individual clinical autonomy, control over resources and power over professional entry and regulation (Harrison, 1999). Medical power can help explain the implementation gap in three respects. First, as we have seen, doctors simply have power to resist any change that they see as a threat, or as an extra burden of work. The fact that EBM has been professionally led has helped limit this resistance and as it has become more widely accepted doctors have tailored their practice to conform, as these interviewees noted:

What makes me change - it’s not scientific, but when I know what my peers are doing. We meet, we talk, we look at publications. (Medical director, Locock et al., 1999: 29)

If the information is easily available, some people will change. When sufficient numbers of informed people make changes in their practice then peer pressure will make the rest change. (GP, Locock et al., 1999: 30)

Second, however, such collective change can allow doctors to subvert EBM. We have found, for example, doctors using the momentum of the EBM movement to bring about changes in practice which may improve the quality of patient experience, even though the evidence for the change is in fact not particularly strong. Equally there are examples of using the rhetoric of EBM to reject unwanted change. One nurse, for example, noted how doctors now use arguments such as: “oh it’s only one trial” and “our patients aren’t similar to those in the trial”, which are the kinds of things they’re learning to say, paradoxically, now that they’re getting more into evidence-based medicine’ (Dopson et al., 1999: 26).

Third, and more specifically, EBM has been seen as one of many threats to traditional clinical autonomy, and this has undoubtedly provoked some resistance. Many clinicians in our studies have argued EBM strips them of the right to make medical decisions without challenge, and that it reduces clinical practice to following a set of codified instructions of protocols which may be inappropriate for individual patients: ‘Show me a man with a rigid policy and I’ll show you an idiot’ (Consultant interviewee, Wood et al., 1998: 33).

Evidence-based guidelines contribute in several ways to deprofessionalization (Haug, 1973), including: enabling patients to challenge and monitor doctors’ decision making more authoritatively; demystifying medicine as an art; relegating the doctor from professional to technical status; making doctors more easily subject to managerial control; and increasing litigation.
This is not to say that doctors resist all guidelines, however. An important distinction may be whether doctors see them as authoritative, credible, professional documents that help them improve their practice, or as a form of management imposition and control. This often depends on the provenance of the guidelines.

The continuing complexity of health care and the need for clinical expertise in both drawing up and applying guidelines might suggest that fears of depersonalization are misplaced. A more plausible explanation would seem to be Friedson’s (1989) stratification theory. This suggests that collectively the medical profession retains power and freedom to determine its own practice, and is successfully fending off managerial control. However, this is achieved by developing a supervisory hierarchy within the profession itself, so that individual doctors’ practice is reviewed and managed by other doctors. EBM and the use of guidelines to regulate practice could be seen as a classic example of stratification, in which some doctors with ‘expert’ status sift the evidence and provide guidance for other doctors to put into practice. This may still be irksome and resisted to some extent, but may be more acceptable than managerial control, provided that the credibility and motivation of the experts is not in doubt (Clinical Standards Advisory Group, 1998).

The rhetoric of EBM may be less acceptable, however, if it is perceived as tainted by a management agenda which is largely about controlling costs. As noted earlier, managers and policy makers have increasingly taken an interest in EBM and may see it as a way of making savings, justifying rationing and curbing clinical freedom.

The trouble is the move to use the phrase ‘evidence based medicine’ has really come from a desire, a need, to be using money as effectively as possible and that still tends to get in the way quite a lot because it just does not fit with good medical practice. (GP/GP tutor, Fitzgerald et al., 1999: 18)

I think it has been seized by the politicians and administrators as a way of saving money because they assume everything we do is totally useless. (Consultant, Dawson et al., 1998: 20)

Klein (1996) argues that medical enthusiasts for EBM are not the main problem, because they at least understand the complexity of medical decision making and the need to consider research evidence alongside other clinical factors. The real danger, he concludes, is:

that the rhetoric of a science-based NHS is likely to arouse excessive and unrealizable expectations . . . That a vulgarized form of the new scientism will be taken up by ministers and managers – and that their eventual disillusionment will lead to a disproportionate reaction. (Klein, 1996: 85)

The problems here are twofold: first that doctors may turn against EBM if they see it as a managerialist cost-cutting initiative, and second that policy makers themselves may also reject EBM when it fails to provide the easy,
certain answers they seek to the intractable problems of complex health care decision making.

Local context

Much of our research into the implementation of EBM has explored the impact of local contextual factors in promoting or inhibiting its uptake. To some extent this is a different level of explanation of reactions to EBM, which has less to do with generic features of medicine as a profession and its relationship with other parts of the system, and more to do with the minutiae of individual relationships, the past history, culture and working patterns of each local organization, availability of resources, individual incentives and disincentives to change, project management arrangements and the presence or absence of local opinion leaders who support the change (Dopson et al., 2002). This is a familiar litany from the generic change management and organizational behaviour literature and is not the main focus of this article. Any change initiative within health care organizations, not just EBM, will be affected by a similar range of factors.

The importance of local contextual factors, however, has consistently been overlooked by proponents of EBM. Over time, as it has become apparent that implementation would not be rational and linear, the EBM movement has started to focus on the organizational and behavioural barriers to getting research into practice (e.g. Bero et al., 1998; Haines and Donald, 1998). Researchers have struggled to find predictable levers that can be relied upon to change practice successfully in any setting, using experimental methods to test their effectiveness. The Cochrane Collaboration Effective Practice and Organization of Care Group (EPOC), for example, routinely restricts its selection criteria for systematic reviews of organizational interventions to randomized controlled trials, controlled clinical trials, controlled before and after studies and interrupted time series analyses. Our findings suggest that such an approach based on the biomedical paradigm is unlikely to provide reliable and helpful insights into organizational change.

Explanations for the biomedical mindset of so much recent research into the implementation of EBM can be sought within the biomedical model that has informed EBM thinking. The day-to-day rhetoric of EBM accepts a high degree of predictability and generalizability of well-founded research evidence. It relies on the assumption that systematic review of randomized trials will provide reasonable certainty about what works and what does not work, and that this will be generally true across all relevant patients.

Setting aside any long-standing epistemological arguments about the nature of scientific knowledge (Lakatos and Musgrave, 1970), there is difficulty in sustaining this view of scientific clinical practice. As outlined above, one of the criticisms of EBM is that diagnosis and treatment are too often uncertain and contingent upon individual patient variables. When it comes
Dopson et al.: Evidence-based Medicine and the Implementation Gap to the field of organizational behaviour, the biomedical model is even less well equipped to grasp the highly context-specific and uncertain factors that affect organizational and political change. The ‘dialogue of the deaf’ that results can be illustrated by the following peer reviewer comment in response to a draft article some of the authors prepared on the role of opinion leaders (since published, Locock et al., 2001). In response to the conclusion that it is difficult to interpret intervention studies of opinion leaders because locally contingent factors will affect their roles, the referee revealed the depth of difference and even plain bafflement between research paradigms:

I wonder if the authors would rethink [their] conclusion? … The idea of such local specificity with so much change between different places and the same place at different times suggests to me that the world is a more anarchic place than I can cope with.

As Strauss and Corbin note, the usual scientific canon of reproducibility has limited value in real organizational circumstances:

Probably no theory that deals with a social/psychological phenomenon is actually reproducible, insofar as finding new situations or other situations whose conditions exactly match those of the original study, though many major conditions may be similar. Unlike the study of a physical phenomenon, it is very difficult to set up experimental or other designs in which one can re-create all of the original conditions and control all of the extraneous variables that may impinge upon the social/psychological phenomenon under investigation. (Strauss and Corbin, 1990: 250)

From evidence-based medicine to evidence-based policy?

EBM has exerted considerable influence, and its apparent success has prompted many other policy areas to seek to follow suit. As Klein argues:

The notion is as seductive as it is simple: if evidence-based medicine (EBM) is desirable then so, by definition, is evidence-based policy (EBP). Just as no-one would argue that clinicians should practise medicine without regard to evidence, so it would seem an incontestable, self-evident proposition. (Klein, 2000: 65)

However, he argues that EBP is in fact ‘highly contestable and misguided’, for two linked reasons. One reason is that, even within EBM, as we have discussed within this article, the notion of evidence is more contested than it appears at first sight. If scientific certainty is elusive even in the world of clinical interventions, then a fortiori the problems become far worse in other evidence-based movements where research evidence is so much more ambiguous and contingent.

Furthermore, Klein argues, the idea of EBP ‘rests on a gross misunderstanding of the policy process’; the policy process is in fact already driven by evidence, but of a very different kind from the narrow scientific view of evidence. Policy decisions incorporate evidence as to whether a policy will
be implementable in practice, and whether it will be politically acceptable. Any policy which cannot meet these criteria is not worth pursuing, whatever the research evidence says.

A similar argument is made in a 1999 issue of Public Money and Management on the theme of evidence-based movements. The editors note striking differences between the acceptance of the need for evidence in health care, and the view in other areas that ‘the very nature of evidence is hotly disputed and there is strong resistance to assigning privileged status to one research method over another’ (Davies et al., 1999: 4). Research evidence has been only one ingredient in the policy process alongside, for example, ideology, professional and bureaucratic preferences and public demand.

In this article, we have outlined the origins and rise of evidence-based medicine, and explored some of the reactions to it, notably among doctors themselves, managers and policy makers. The biomedical scientific base of EBM has been one of its major strengths in appealing to the medical profession, and the history of EBM is characterized by strong professional leadership. Given medicine’s continued autonomy and power to resist unwanted policy initiatives, it seems unlikely that EBM would have got as far as it has without this professional support.

Among other evidence-based movements, EBP may be perceived more readily by practitioners as a managerially led means of control or cost-cutting, or an inappropriately reductionist view of what matters in policy decisions. Other professions may of course have less power than medicine to subvert EBP or to reject evidence-based policies they do not agree with, but the difficulties of imposing change in the face of resistance should not be underestimated. There are important lessons to learn from the history of EBM about professional reactions to an evidence-based approach and the need to ensure professional ownership. How this is achieved will vary from profession to profession, but must take into account existing values, practices and beliefs about both the nature and the provenance of what constitutes legitimate evidence.

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