Implementing Evidence-based Health Care: a New Model for Rural Areas

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6th National Rural Health Conference
Canberra, Australian Capital Territory, 4-7 March 2001
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ABSTRACT

This paper proposes a new model to understand factors influencing the adoption of evidence-based health care (EBHC) in rural Australia. EBHC refers to the use of evidence to inform decisions about health at (1) a public health level, and (2) the organisation and delivery of the health care system. It also includes evidence-based medicine (EBM) or practice that uses evidence and clinical expertise to make decisions about the care of individual patients. This third level is the focus of this paper. Imperatives for the use of evidence-based approaches include demands for greater efficiency, effectiveness and accountability. Within rural areas, the fact that there are fewer health care services heightens the demand for greater efficacy. Investigations have identified various barriers to the use of EBM; research findings reveal generally poor uptake among practitioners. Comparatively little research has been conducted on the adoption of EBM in rural health. Data for this paper come from two sources: (1) critical analysis and extrapolation of empirical evidence about the implementation of EBM; and (2) and the identification and critique of four orthodox models of implementation. Factors consistently reported to influence the adoption of EBM in rural areas include: inadequate training in the methodology of EBM; lack of infrastructure (such as access to information technology); the generalist nature of rural practice; lack of time due to workload; and the fact that rural populations are under-researched. Most of these factors are pertinent, but are rooted in implementation models that depict a mechanistic transfer of knowledge from research to clinical practice. In other words, the models posit that EBM can be successfully introduced through strategic implementation or “manipulating the right variables”. Such a model is inadequate; we need to move beyond this to explore new models that incorporate epistemological and socio-behavioural dimensions. For instance, new models should aim to question the urbo-centric assumptions about health care systems that are embedded in EBM. In addition, we need to recognise that the professional training of different types of health practitioners varies greatly in its alignment with the scientific paradigm and positivist research. Certain practitioners are much more likely to see scientific knowledge as incomplete or contested. Practice wisdom or clinical experience is less tangible, but may be seen to be superior rather than supplementary to scientific evidence. The rural context shapes these values and attitudes. Finally, rural health professionals retain substantial autonomy over their practice. This paper suggests that strategies for embedding EBM in rural health systems and practice will have to move beyond linear, deterministic models. A number of practical suggestions are offered.
INTRODUCTION

Evidence-based health care (EBHC) is the new paradigm for informing decisions about health. It incorporates three levels of decision making: (1) public health interventions for the whole population or sub-populations designed to promote health and prevent ill-health; (2) the organisation and delivery of the health care system; and (3) evidence-based medicine using clinical guidelines to make decisions about the care of individual patients. This paper is concerned principally with the third level — evidence-based medicine (EBM). The prominence of EBM is evidenced by: the release of the National Health and Medical Research Council’s (NHMRC) handbook series on clinical practice guidelines; the establishment of Australian centres for evidence-based medicine and nursing; the development of numerous evidence-based policies and programs at state and federal level; the production of a spate of clinical practice guidelines; frequent workshops on what it is and how to practise it; an exponential growth in textbooks and journals devoted to it; and the inclusion of evidence-based approaches into health curricula. It was also one of the two major foci at the last National Rural Health Conference (1999). Clearly, EBM has arrived. It has strong political support, is firmly entrenched in the health bureaucracies, and has captured the interest of researchers and academics. Evidence-based approaches herald improvements to the quality of health care through reducing ineffective interventions and increasing treatments with maximum proven benefit. The continued imperatives for effective, efficient, appropriate and accountable health service delivery will ensure that EBM maintains its prominence.

Nevertheless, there is considerable evidence that EBM is not happening “on the ground” and even less evidence that it is on taken hold on rural ground. This paper advances a new model to understand the factors influencing the adoption of EBM in rural Australia. The first section of this paper considers critical issues concerning the appropriateness of and capacity for the implementation of evidence-based decision making in rural health in Australia. The following section reviews evidence about the generally low levels of implementation of EBM. The major barriers are also identified. The paper then creates a typology of the four orthodox models of implementation, and critically examines the limitations of each, with particular reference to rural health. A new model is then proposed. This model provides an innovative and revealing framework for understanding the factors that promote and hinder the uptake of EBM in rural Australia.

A brief description of the methodological underpinnings of evidence-based approaches is necessary to inform subsequent discussion. The process for conducting EBHC typically involves five steps: identifying answerable questions; locating the evidence; critically appraising the evidence; applying the results of the appraisal; and evaluating the outcome. Evidence can be appraised according to its level, quality, relevance and strength. The hallmark of EBM is its reliance on logical, rigorous, conscientious and explicit methods of decision making. Contrary to general opinion, the evidence base for EBM is not restricted to randomised control trials and meta-analyses. There is, however, a generally accepted hierarchy of evidence. The six levels reflect the power of the study design to eliminate bias. The levels range from (1) a systematic review of all relevant randomised control trials down to (6) evidence obtained from case studies. EBM is based on the scientific paradigm which assumes that: reality is constituted of
causally-linked phenomena that can only be ascertained through reference to empirical evidence of their existence; the positivist scientific method — using experimental research designs — is the pre-eminent procedure for generating valid knowledge based on quantitative data; and the ultimate purpose of science is to generate universal laws that enable explanation and prediction of phenomena.

EBM AND RURAL HEALTH

There are several reasons why EBM might have particular relevance to and advantage for rural health practice. First, the fact that there are fewer health care services in rural areas heightens the demand for greater efficacy. EBM provides the best available information to ensure that treatment decisions will reduce “unnecessary, ineffective or harmful interventions, and to facilitate the treatment of patients with maximum chance of benefit, with minimum risk of harm, and at an acceptable cost”. Second, when the potential of information technology and telecommunications is used, EBM can provide access to a wealth of information to inform clinical decision making. The resources of the Cochrane Collaboration, and other on-line data bases of published research are now available to help overcome the tyranny of distance imposed by geographical and professional isolation, as well as difficulties accessing continuing education. Third, evidence-based health care at the public health level has revealed inequalities in the patterns of morbidity and mortality affecting rural Australia. This provides the opportunity to develop health promotion interventions targeting the known risk factors.

However, the potential benefits of EBM for rural health are hampered by a number of empirical, contextual, and practice-oriented factors. The first limiting factor is the lack of sound empirical data to appraise for EBM. A recent comprehensive review of rural health research in Australia has revealed a steady increase in the number of research articles published over the last ten years. Nevertheless, the majority of articles are various forms of needs analysis, with comparatively little research on the development and evaluation of public health and health service interventions. Only 41% of the research articles address the six National Health Priority Areas. Furthermore, the study design and “level of evidence” of the research articles is unreported. Therefore, it is difficult to determine the quality of the empirical evidence that may be admitted for use in developing evidence-based clinical guidelines. A second literature review of randomised control trials addressing Australian Aboriginal health needs identified only 13 studies, and only one of these involved adults. This lack of well-designed studies limits our capacity to accurately identify effective health interventions. There are at least two limitations to the generalisability of results from studies of non-Australian Aboriginal and non-rural populations. Inadequate resources or lower rates of compliance may mean the intervention cannot be applied as effectively. Also, the effect of the intervention may vary due to particular genetic, environmental or cultural influences. Generally, the state of knowledge of rural health is underdeveloped. It would seem premature, then, to expect that sound clinical guidelines based on the existing evidence could be developed for use by rural health practitioners.

A second set of factors limiting EBM relate to the contextual characteristics influencing health status and health practice in rural areas. One of the criticisms of EBM generally, is that it draws upon a biomedical model of health in diagnosis and treatment. Alternatively, by applying a social model of health, it becomes evident that
socioeconomic status, environmental factors, risk-taking behaviours, and physical and cultural access to services are influential in explaining rural health inequalities. Therefore, it may be more efficient and effective to shift the balance of funding to the other two levels of evidence-based health care: public health, and the organisation and delivery of the health care system. Other issues possibly limiting the application of EBM in rural health include the greater time pressure facing rural general practitioners, the need to adapt clinical guidelines to local conditions, the inapplicability of universalistic clinical guidelines, poorer access to research data bases — particularly for remote practitioners, professional differences, and lack of organisational support. Rural practitioners also tend to be generalists, their breadth of practice makes implementation of EBM particularly challenging. Clinical guidelines that incorporate urbo-centric assumptions about the structure and availability of services are likely to be dismissed by rural practitioners. There has been little empirical research on the processes that drive the adoption of EBM when mediated by the rural context.

Clearly, there are substantial barriers to the successful application of evidence-based approaches in rural health. The following section briefly reviews the effectiveness of various implementation strategies.

**IMPLEMENTATION OF EBHC**

The implementation of EBHC involves at least two major exchanges: the transfer of knowledge from groups of researchers to groups of practitioners; and the transfer of knowledge into practice. The former transfer has met with moderate success; the latter is proving a challenging task. Change is a complex process. There are no “magic bullets” to guarantee the adoption of new health care practices.

It is now understood that the simple dissemination of evidence-based practice guidelines is likely to have no impact on uptake. Some positive factors include the use of opinion leaders and champions, the provision of incentives, and the education of practitioners and patients. Despite this, there are very real points of resistance and even hostility to the use evidence-based practice. It has been criticised for: reinforcing rigid disciplinary boundaries; disregarding practice wisdom; valuing only hard-line scientific research; and threatening professional autonomy. Moreover, the utilisation of evidence-based practice in rural areas has not been thoroughly investigated.

Barriers to the adoption of clinical guidelines were discussed at a recent Evidence-Based Clinical Practice Research Program workshop. Participants were researchers funded through the Strategic Research Development Committee, one of the National Health and Medical Research Council’s principal committees. Major challenges to successful and sustainable implementation were identified as: achieving local ownership of evidence; using local and respected opinion leaders; ensuring adequate infrastructure; close involvement of clinical staff from the outset; providing appropriate training; and gaining endorsement of clinical guidelines by leading organisations.

To advance our understanding of the effectiveness of various implementation strategies, it is necessary to identify and critically assess the behavioural models that they are derived from. The following section picks up this challenge.
MODELS OF IMPLEMENTATION OF EBM

Table 1 summarises the four major models of implementation of EBM. This table extends the work of Lomas and Haynes, by creating a typology of models rather than strategies. This shifts the level of analysis from a focus on particular interventions to the theoretical approaches that underpin the strategies. The advantage of this is that it exposes the underlying assumptions behind the strategies. The four models are “pure types”. That is, they are abstracted versions of the actual models that are likely to be found in reality. Each of the models is analysed in terms of its underlying assumptions, common implementation strategies, and limitations. A critique from the perspective of rural health is also offered. The four models are:

- Type A: Passive Dissemination Model;
- Type B: Educational Model;
- Type C: Stimulus/Reward Model; and
- Type D: Change Management Model.

The Passive Dissemination Model assumes that practice changes, in line with EBM, will occur through the accumulation and release of research-based knowledge and clinical guidelines. This further assumes that practitioners have the skills, resources and time to locate information, and then use it to make changes to their existing practices. The major limitation to this approach is that it is research driven and ignores the research/practice nexus. This model has been found to be particularly unsuccessful. For example, recent surveys of health professionals have shown that they have generally low levels of knowledge about evidence-based practice, low levels of access to bibliographic databases, and poor skills in locating and appraising relevant publications. More disturbing still is a finding that only half of a group of specialists were aware of the existence of the NHMRC’s clinical guidelines in an area of their daily practice. From a rural perspective, the Passive Dissemination Model would be unsuitable on at least three counts: there is inadequate information technology infrastructure; rural practitioners have little time; and the guidelines would not be tailored to the local context.

The Educational Model appears to be in wide use. It assumes that continuing education programs will lead to improved practices. Through being upskilled in the processes of EBM or by being alerted to the existence of specific clinical guidelines, practitioners are expected to initiate changes. Continuing education has been found to have limited impact on practice, especially when the programs rely on commonly used delivery methods such as conferences or other didactic activities. Practitioners do not always behave in a logical, disinterested way. Education alone rarely leads to major, sustained changes. Continuing education for rural practitioners is problematic. There are substantial logistical problems with accessing education, and the courses are often not tailored to rural needs. Academic detailing involving outreach visits to rural and remote practitioners in their own settings would become a very costly and time-consuming exercise.
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<th>Model</th>
<th>Underlying assumptions</th>
<th>Common strategies</th>
<th>Limitations</th>
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| A: Passive Dissemination | ♦ Making scientific information available will automatically lead to adoption in practice  
♦ Assumes practitioners have skills, resources and time to locate and use information | ♦ Provision or general release of evidence and clinical guidelines | ♦ Research driven agenda  
♦ Little acknowledgment of practice issues  
♦ Has negligible impact | ♦ Inadequate rural infrastructure  
♦ Guidelines not tailored to local context  
♦ Insufficient time to access |
| B: Educational | ♦ Education will produce practice changes  
♦ Practitioners will undertake educational activities, evaluate evidence, select appropriate guidelines and implement evidence-based decisions | ♦ Continuing education | ♦ Continuing education — particularly using common didactic or passive learning techniques — has little impact on practice  
♦ Practitioners do not always behave in a logical, disinterested way | ♦ Courses often not tailored to rural needs  
♦ Logistical problems in attending continuing education |
| C: Stimulus/Reward | ♦ Behavioural responses can be produced through appropriate stimuli and rewards | ♦ Audit, cue-cards, feedback  
♦ Bonus payments | ♦ Ignores individuals capacity as active, reflective agent  
♦ Rewards offered may be outweighed by costs of change or rewards sustaining existing practice. | ♦ Enduring practitioner/client relationships can mean that existing practice are deeply entrenched  
♦ Universal reward systems may be inappropriate |
| D: Change Management | ♦ A health organisation exists with rational, democratic staff  
♦ Meeting known preconditions will produce change  
♦ Shifting the right organisational “levers” will produce change | ♦ Local and respected leaders  
♦ Local consensus processes  
♦ Identifying stakeholders and engineering a managed change process | ♦ Rhetoric of local consensus often doesn’t match reality  
♦ Collaborative change processes fall foul of bureaucratic and medical hierarchies | ♦ Higher levels of practitioner autonomy curb the effect of change strategies  
♦ Lack of organisational structure to introduce change |
The Stimulus/Reward Model draws heavily upon behaviourist theory. It assumes that behavioural responses can be produced through appropriate stimuli and rewards. This model advocates strategies such as certain types of decision support systems, and clinical audits reinforced by financial incentives or penalties. Reliance on this mechanistic model largely ignores the capacity of human beings for reflective practice. The rewards offered may also be outweighed by the rewards sustaining existing practice or by the costs of change. For example, in rural areas, practitioners and patients may well have enduring relationships where practices are supported by deeply entrenched expectations. In addition, universalist rewards systems such as financial incentives may not be appropriate.

The Change Management model is increasingly being promoted as best practice. Change management assumes that implementation can be achieved through ensuring certain preconditions are met, by manipulating the correct organisational “levers”, or developing “blueprints for change.” These preconditions include: the availability of good evidence; ready access to the evidence; an environment which supports and encourages use of the best evidence; and effective mechanisms for promoting knowledge uptake. The broader change management literature would suggest that this model can fail because the rhetoric of local consensus processes often doesn’t match reality, and collaborative change processes fall foul of powerful interests — in this case, medical and bureaucratic hierarchies. In terms of rural health, the precondition regarding access to evidence remains problematic for reasons discussed above. Second, lone rural practitioners or even the smaller rural health organisations lack an organisational structure through which this model of change can be introduced. Related to this is the high level of autonomy of rural practitioners, which can curb attempts at change management.

The four models described above are often employed together. Indeed, it is now acknowledged that a multi-dimensional approach works best. Using evidence-based approaches to implementing EBM is widely promoted. However, implementing sustainable, evidence-based change to health practice remains a stubborn problem. Perhaps it is time to question the assumptions underpinning these models. EBM derives largely from research based upon controlled studies. By contrast, the world experienced by the health practitioner is much more complex and dynamic. The four models depict a fairly linear and mechanistic view of the transfer of knowledge. Even the change management model, which incorporates some socio-behavioural strategies, still assumes that change can be effected through manipulating the right variables. Knowledge transfer is seen as a technical problem. The context of rural health practice presents additional layers of complexity. The following section offers an alternative model to understand the barriers to EBM.

INTERPRETIVIST APPROACHES TO THE ADOPTION OF EBM IN RURAL HEALTH

A recent British study used an interpretivist perspective drawn from the social sciences to investigate limits to the adoption of EBM in elective orthopaedics. This case study approach used primarily qualitative methods to gain an insight into how people construct and make sense of their social reality. This approach is holistic, rather than...
reductionist, and is more sensitive to the influence of contextual factors than a positivist methodology. Interpretivism shifts our understanding of the causes of non-implementation of EBM. Knowledge transfer is understood to be impeded because practice is constructed locally by different — sometimes competing — stakeholders who have different interests, models of practice, and epistemologies. Specifically, there are three forces operating. First, the methodology of and knowledge generated by science is viewed as inconclusive or contested. Second, groups of professionals exercise substantial autonomy over their work practices. They can resist bureaucratic pressures and the prescriptions made by largely marginalised researchers. Finally, clinical knowledge is gained through experience. It is less tangible, but may be seen by practitioners to be superior rather than supplementary to scientific evidence.22

What insights might an interpretivist perspective offer in understanding the implementation of EBM in rural areas? The following ideas are speculative; they are shaping the author’s current research in this area.

First, it has been argued that the nature of rural practice is substantively different from urban practice. This would appear to hold true across a range of professions.9,23 One of the recurring claims is that rural health professionals are generalists. They must be able to turn their hand to a wide range of case presentations, often outside of their formal position descriptions and without access to immediate specialist support or resources. This being so, their clinical knowledge base derives from experience accumulated “on the job” and “in the field”. This wisdom is “tacit and experiential” in nature,22 so that they may well see their practice is more akin to a craft than a science. Therefore, rural practitioners are likely to question the validity of EBM.

A second barrier is that different rural health professions vary in their understanding of and commitment to the scientific paradigm. Among social workers, for example, there is concern that randomised control trials have demoted and marginalised other forms of evidence. There is further concern that the results of these trials have limited applicability in the resolution of complex social and psychological cases.24 Nurses, too, have taken issue with the knowledge base underpinning EBM. The lack of a tradition of research among nurses means that they have contributed comparatively little to EBM. Isolated rural nurses without the support of an academic resource are unlikely to be able to initiate large scale, scientific research.25 As a result, some nurses claim that EBM has subjugated their knowledge to powerful medical interests.26 In other words, EBM is uni-disciplinary. The non-medical professions perceive science as contested and offering an incomplete version of reality. Therefore, attempts at introducing EBM across professional boundaries is likely to be met with resistance. Professional isolation and difficulties accessing continuing education among rural practitioners is likely to accentuate the problems of developing multi-disciplinary approaches to evidence-based practice.

Third, the high levels of autonomy and independent practice that characterise many aspects of rural health limit the penetration of EBM. Lack of access to academic resources, limited involvement in research projects, and being out of the gaze of health bureaucrats means that rural health clinicians are able to continue to exercise a high degree of control over their daily practice. This degree of control obviously varies with the professional discipline. Rural nurses have expressed concern that their practice is being shaped by persons outside the profession.27 Doctors, on the other hand, are
widely perceived to have a high degree of autonomy. The extent to which rural health practitioners function as part of a team means that there are diverse, sometimes competing, professional rationales and missions. This differentiation will hinder consensus about EBM.

CONCLUSION

While the imperatives for introducing EBM are clear, implementation is problematical. The distinctive features of rural health, rural service systems and rural practice present additional complexities in the sustainable uptake of EBM. This paper has argued for an alternative perspective to understanding the implementation of EBM. Interpretivist approaches allow us to move beyond narrow mechanistic models of knowledge transfer. Key factors impeding uptake in rural areas include: contested views of science between professions; the generalist, experiential nature of rural practice; and the high levels of autonomy of isolated practitioners. Resolution of these issues will not be easy. First, there is an evident need for more research on evidence-based practice in rural areas. This paper has also presented a case for greater diversity in research perspectives and methodologies. Second, the research and evidence-based literacy skills of rural health practitioners also need to be upgraded through carefully targeted, multidisciplinary undergraduate and continuing education programs. Third, evidence-based guidelines need to be locally adapted to attend to the context of rural practice. These guidelines must integrate the allusive, experiential aspects of rural clinical knowledge with the best available evidence. Techniques and processes for the local adaptation of guidelines need to be more fully developed, disseminated and evaluated.

REFERENCES


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