Evidence-based medicine and general practice

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SUMMARY
Evidence-based medicine (EBM) aids clinical decision making in all fields of medicine, including primary care. General practice is characterized by particular emphasis on the doctor–patient relationship and on biomedical, personal and contextual perspectives in diagnosis. Most evidence available to general practitioners (GPs) addresses only the biomedical perspective and is often not directly applicable to primary care, as it derives from secondary or tertiary care. Emphasis on the biomedical domain and the randomized controlled trial (RCT) alone reflects a reductionist approach that fails to do justice to the philosophy of general practice. The art of medicine is founded on context, anecdote, patient stories of illness and personal experience, and we should continue to blend this with good quality and appropriate research findings in patient care.

Keywords: Evidence-based medicine; research; diagnosis.

Introduction
‘The wise man is not learned, the learned man is not wise’ (Tao te Ching, quoted in Benjamin Hoff, The Tao of Pooh. London: Methuen, 1984).

The principles of EBM have existed in the areas of critical appraisal and clinical epidemiology for decades, although EBM itself was first described in detail in America in 1992. Since then it has become the latest focus in the search for improved health care. Further articles described how to use the principles on a practical basis, and a journal now exists to promote EBM further in routine clinical practice. There are five basic tenets of EBM:

- Clinical decisions should be based on the best available scientific evidence
- The clinical problem determines the evidence to be sought
- Identifying the best evidence involves epidemiological and biostatistical ways of thinking
- Conclusions based on the available evidence are useful only if put into action for individual patients or for population health care decisions
- Performance should be constantly evaluated.

Identifying evidence to support or refute patterns of health care has certain advantages: best care is suggested by the results of an appropriate literature review; it promotes uniformity of care so that best care can become standard care; it allows individual clinicians to become aware of the range of certainty and uncertainty in clinical decision making; and it suggests areas of clinical uncertainty that require more definitive evidence than anecdote or ‘usual’ practice.

These advantages apply equally to primary, secondary, and tertiary care, and recent editorials and correspondence pages have discussed the role of EBM in clinical practice. They conclude that best external evidence should always be integrated with clinical expertise; doctors should not disparage or neglect their pragmatic clinical skills and experience. Such neglect or disparagement runs the risk of alienating those who may otherwise embrace its principles.

Evidence-based medicine in practice
The main principle of EBM is that clinical decision making should be influenced by rational analysis of evidence and previous experience; an approach that has been with the profession since Hippocrates. Recent studies showed that decision making can usually be supported retrospectively by evidence in both primary care and general medicine, even without a prior commitment to EBM. However, accessing evidence to answer clinical questions is not such a straightforward issue, especially in primary care.

Decision making depends on both accessing and interpreting evidence. In primary care, GPs have less than five hours a week for reading, educational courses, and teaching. When they do access the literature to find evidence about clinical problems, they should be aware of certain limitations, especially in general practice, where until recently there have been few journals publishing primary care work and research. Negative findings are less likely to be published: 25–50% of studies on a given topic may not get published. There are also problems in accessing prior relevant work. Depending on the topic, databases such as Medline have only a 50–80% recall of relevant literature, and many areas of ‘grey literature’ (reports, theses, conference proceedings, and press releases) are difficult to access electronically.

If review articles are available and accessible, practitioners may find contradictory use of papers in a clinical debate. Papers may be quoted in differing ways, or not quoted at all. For example, in the debate about screening and intensive management in patients over 75 years of age, the same three original papers were used variously by different authors to demonstrate both benefit and no definite benefit; other authors omitted discussion of these papers completely. The quality of review articles is inversely related to the expertise of the reviewer in the clinical topic, and practitioners are justified in maintaining some scepticism about their conclusions.

What doctors read is influenced by the bias and experience they bring from their own practice. There are biases in implementing research findings in clinical practice, deriving mostly from peer influences rather than the research evidence itself. These peers, who may include ‘experts’ or opinion leaders, have their own bias in interpreting available data. Thus, considerable ‘spin’ is put on recommendations made from original data and how this may be implemented in practice.

For example, the Medical Research Council’s (MRC) trial of mild hypertension in patients under 60 years suggested a benefit of one prevented stroke per 800 patient-years on drug treatment; however, one in three patients experienced side effects from the medication. Some doctors may judge the cost–benefit ratio suf-
ficient to warrant drug treatment, while others may interpret it to
support non-pharmacological approaches for those with mild
hypertension.

Advice about smoking provides another example. The most
widely quoted study showed that brief advice to give up smok-
ing, with a warning of follow-up, resulted in 5% more smokers
quitting.44 Not all clinicians view this as an efficient use of time:
while 5% has good implications for the public health, some may
view it as too small a benefit for the outlay in time and discus-
sion with an individual patient, given competing demands in the
consultation.

Interpretation of data is even more difficult for patients, who
usually acquire medical information through the media, and may
bring their concerns and requests for more information to their
GP. The scare over third-generation oral contraceptive pills and
venous thrombosis provides an example.35-39 Early research find-
ings were presented to the UK population even before the origi-
nal papers were published, producing a furore out of all propor-
tion to the ‘risks’ identified by the researchers. These results
were presented without acknowledging the potential benefits in
terms of lipids and cardiovascular risk, and without considering
the effects of likely non-compliance, which routinely follow
such scares.40 Genetic screening is another area that is increas-
ingly controversial.41

It becomes clear that applying EBM principles to patient care
raises genuine difficulties. EBM has been considered from the
primary care perspective before, as a discussion of how available
knowledge can be integrated with the philosophy of primary
care,42 but we will discuss how the particular characteristics of
primary care lead to further concerns about the implementation
of EBM, and highlight possible strategies to address the prob-
lem.

**General practice: biomedical, personal, and contextual**

General practice is characterized by particular emphasis on the
doctor–patient relationship and on biomedical, personal, and
contextual perspectives in diagnosis (the triple diagnosis).43,44
Practitioners are accustomed to holistic clinical decision making,
integrating a wide range of different types of knowledge and
emotions,45 treating individuals in their usual context, and
addressing their particular concerns on the situation.44 Analysis
of these characteristics of general practice identifies certain limi-
tations in the applicability of EBM.

EBM predominantly addresses the biomedical perspective of
diagnosis, principally from a doctor-centred paradigm. The
profession defines a problem, recognizes a lack of evidence avail-
able to inform a solution, and then commissions research to pro-
vide that evidence. A role for patients in deciding on the most
important questions they want answered, and a place for ‘quality-
of-life’ measures are less easy to achieve. In contrast, several
conditions respond better to more patient-centred care, including
headache, blood pressure control, diabetic control, and breast
cancer.46-50

Doctors also need evidence that is derived from a patient-cent-
tred paradigm and that recognizes the personal and contextual
elements to decision making in practice.44 Examining these ele-
ments, another concern about EBM becomes apparent: the RCT
is often unhelpful in these investigations.27,51,52 even though it is
promoted as the gold standard of research methodology.53

The research methods used to obtain data in the personal and
contextual dimensions may require different strategies, allowing
for more ‘circumstantial’ evidence than the ‘watertight’ evidence
of the RCT.52 (Circumstantial and watertight are terms applicable
to legal evidence.) Some clinicians regard only RCT evidence as
acceptable, though the original proponents of EBM would not
concur.

**An example — excessive drinking**

There is a substantial body of opinion and evidence about ‘brief
intervention’ for excessive drinkers, suggesting that it is effective
and should be widely implemented in primary care.54 General
practitioners recognize considerable personal and contextual ele-
ments in the diagnosis of excessive drinking, and these influence
their patient management. Evidence about interventions for these
other elements is likely to be less ‘rigorous’ than the RCT.

For example, ‘personal’ factors may include depression or stress
at work, for which counselling may be more appropriate than the
brief intervention; evidence for this would often be derived from
non-randomized, non-controlled studies such as cohort studies or
descriptive research. ‘Contextual’ diagnosis may include
substantial social disorganization and lack of resources, for
which a social work approach may be appropriate; evidence
for this intervention could be derived from practice- or area-spe-
cific descriptive studies. An understanding of which ‘level’ of
intervention is most appropriate, and most valued by patients,
may be gained from qualitative studies, with interviews to assess
their priorities, readiness, and motivation for intervention.

**The triple diagnosis**

The above discussion demonstrates that more is required than a
simple biomedical approach or the use of RCTs to assist practi-
tioners in decisions on managing excessive drinkers. The evi-
dence should be accrued using different methods, each appropri-
ate to a different aspect of the triple stage diagnosis. We have
provided one example but there are countless others, such as
‘minor’ illness or chronic disease management, where the triple
stage diagnosis (and therefore triple stage research planning)
needs to be considered.

However, the costs and commissioning of research are likely
to focus on more obviously cost-effective treatments, primarily
using biomedical indices as definitive outcome measures. This
may be to the detriment of studies looking at ‘softer’ measures of
psychosocial well-being, such as quality-adjusted life years,55
where relative novelty adds to the difficulties in interpretation.
The pharmaceutical industry is also likely to direct its finances
towards trials of specific therapies, and these will probably be
based on drug treatments at the expense of exploring non-phar-
macological approaches.56 Biomedical data are easier to research
in general practice, which hinders the acquisition of evidence
from the other two dimensions.

A note of optimism does come from the increasing research
priority for primary care in the UK.56,57 Increased priority and
funding do not necessarily result in better research because
research does not always address the needs of practitioners, and
health services research is not an alternative to research in the
context of primary care — they are a necessary first step.

If these deficiencies can be addressed, the decision-making
process employed for an individual patient will be able to consid-
er the circumstances of the patient, the clinician, and the clinical
problem. The application of EBM principles in general practice
will be based on a more comprehensive range of evidence and
will assist the real-life clinical decision making in which the bal-
cane of ethical principles varies at different times. These princi-
les include the sometimes conflicting concepts of ‘rule utility’
(maximizing benefit for a group of patients) and ‘act utility’
(optimizing the choice of interventions for an individual).58

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Every GP can think of clinical instances where this weighing
up of the balance of utilities occurs. As illustrations, Lamberts
and Hofmans-Okses identify tangible therapeutic dilemmas: a 55-year-old woman with a myocardial infarction who also has terminal pancreatic carcinoma; considering how to help a 40-year-old man with a new diagnosis of HIV; and the 'best' treatment for a 70-year-old male stroke victim with a recurrent urinary tract infection.\(^{45}\) One that has troubled us is deciding whether or not to use anti-coagulation for elderly patients in residential care who have atrial fibrillation.\(^{60,61}\)

**Appropriate evidence**

The difficulties produced by the lack of evidence relevant to the personal and contextual diagnoses are complicated by concerns about the applicability of the available biomedical evidence to general practice, as much of the information is not obtained from primary care. Many examples exist where hospital-based evidence is handed down to primary care clinicians as a 'must' policy. Starfield gives examples (including childhood anaemia and management of pelvic inflammatory disease) where textbooks quote figures from hospital-based clinic settings which are transposed directly into the entirely different setting of primary care.\(^{62}\) McWhinney provides examples in which the differing denominators of populations can make investigations (such as ECGs for chest pain and investigations for rectal bleeding) mandatory in hospital, but at the very least difficult to interpret in a primary care situation.\(^{44}\)

Evidence-based medicine can imply a simplistic and mechanistic world-view in which cause and effect are easily distinguished. Systems theory teaches us that the world is more complex and that we must appreciate the context, framework, and setting in which decision making occurs.\(^{44}\) We must study the validity of applying evidence from secondary or tertiary care settings in primary care.

**The art of medicine**

Medicine has long been noted as a profession that combines the best knowledge available with an appreciation of a good ‘bedside manner’. The motto of the Royal College of General Practitioners (*Cum Scientia Caritas*) enshrines this, promoting science and caring as the twin bases of good quality general practice.

Balint showed that GPs are not uncaring, unemotional professionals, but can use emotions and a sense of awareness of all that takes place in meetings with patients to assist diagnosis.\(^{63}\) Much of this work is difficult to investigate with traditional scientific methods, but is still relevant today, especially in this era of increasing knowledge.

Recently, it has been re-emphasized that primary care medicine combines a rational scientific method and a less rigorous ‘art’.\(^{64-67}\) The art of medicine is founded upon context, anecdote, patient stories of illness, and personal experience; these are classified as ‘lower quality’ in the hierarchy of evidence, but have an equally valid contribution to medical decision making and should be integral to our practice.

**Conclusions**

The advocates of EBM advocates recognize that it does not provide answers to all problems, as research provides imperfect evidence for each unique scenario. Doctors should interpret the evidence in each instance, weighing up the evidence for or against certain therapies, and tailoring it to a patient’s context and preferences. Ultimately, the doctor will arrive at an opinion on the evidence.

We laud the principles of EBM but have identified concerns that arise from over-reliance on it in primary care. EBM could be over-emphasized in all medical fields, with a consequent trend towards a biomedical approach; in general practice this would hinder further progress in developing its philosophy and practice. The full three-stage diagnostic process of biomedical, personal, and contextual diagnosis is central to optimal general practice. When applied to primary care, we suggest that EBM should promote studies that do not solely use RCT methods to investigate the personal and contextual domains; qualitative and case-control study methods are also valid and important areas for study. General practitioners have other concerns about the evidence available for use in primary care, as much of it comes to us from a hospital-based setting, and may not be relevant to general practice patients.

General practitioners should make no apologies for the inevitable and difficult process of interpreting and integrating scientific evidence, personal experience, and knowledge of our patients. It is this integration of ‘stories’, anecdotes, case histories, and evidence that is one of the successes of primary care.\(^{68}\) A positive approach could be to put the flesh of clinical stories, case histories, qualitative research, and other rich sources of information onto the hard bones of EBM.

With reference to the *Tao of Pooh* quotation at the beginning of this paper, clinicians should continue to temper learning with wisdom — itself a product of personal experience and individual insight. We do not advocate ad hoc, individualistic clinical freedom but rather call for continued attention to the philosophy of general practice and the triple stage diagnosis, to patient participation in care, and to the appropriate use of the principles of evidence-based medicine.

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