

The medical emergency team, evidence-based medicine and ethics

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The medical emergency team (MET), which may be summoned by anyone in a hospital to treat a patient who appears acutely unwell, has been generally accepted as scientifically rational, with no adverse clinical outcomes and only modest resource requirements. Despite this, many centres appear to be awaiting “gold standard” evidence of its effectiveness. We suggest that the quest for evidence is providing scientific justification for institutional inertia, and that further delay in implementing this system may even be unethical. We propose that decisions about changes in healthcare should consider scientific rationality, clinical reasonableness and resource implications, as well as evidence and ethical implications. (MJA 2003; 179: 313-315)

A MEDICAL EMERGENCY TEAM (MET)¹ can be simply described as a cardiac arrest team with a changed calling criteria. Anyone in a hospital may summon the team to a patient who appears acutely unwell, even if the patient has not actually had a cardiac arrest. The introduction of a MET may be accompanied by education on better recognition of acute illness, and an ongoing audit and education process. There is an implied and unquantified increase in the workload of the intensive care unit (ICU) staff, and a need for them to shift the focus of their work (at least temporarily) outside ICU.

The in-hospital response to acute illness has been shown to be suboptimal.² As a remedy, the MET system appeals to many, but has been the subject of ongoing debate. There have been no suggestions that there may be adverse clinical outcomes from a MET; rather, the concept has been challenged on the basis of the quality of the evidence.³ In this age of evidence-based medicine (EBM), such a challenge is justification for a pre-emptive halt to change, while evidence is accumulated. Possible resource implications have also been a point of discussion.⁴ Perhaps the most important (though unstated) factor preventing implementation of the MET system is that it represents a change to established hospital systems, hierarchies, and departmental responsibilities. In this regard, we feel that the quest for evidence has provided scientific justification for institutional inertia.

New evidence for the MET system

Those who have been following the debate about the possible benefits of the MET in hospitals will welcome the

study by Bellomo and colleagues⁵ on page 283 of this issue of the Journal. In a major teaching hospital, introducing a MET was associated with a 65% reduction in cardiac arrests. Perhaps more surprisingly, there was a 26% reduction in the overall hospital death rate, equivalent to three lives per 1000 admissions.

The authors did not limit their study to patient outcomes, but also considered some resource implications of the MET system and characterised the interventions by the MET. The increased workload does not appear to be excessive. Interestingly, most interventions appeared relatively “simple”, a finding somewhat reminiscent of that in a study of interventions by a hospital trauma team.⁶

The results of Bellomo et al support the findings of others,⁷ and appear to strongly support the MET system. However, those who enjoy academic disputation should not lose heart — there are plenty of opportunities to dispute some aspects of the study, and the MET system generally. This ongoing controversy may also teach us much about the possible ethical implications of misuse of the concepts of EBM, and the dangers of attempting to base decisions about the delivery of medical care solely on “evidence”.

The limits of evidence-based medicine

EBM may be misused in scientific debate. Desire for scientific certainty and enthusiasm for scientific rigour may lead to inappropriate discounting of anything less than Level 1 evidence. The more rigorously EBM is applied, the less the evidence that the intervention being studied is effective — the “stainless steel” law of evaluation.⁸ This can lead to an apparent inability to prove anything, so that EBM produces a lot of “negative” outcomes. These limitations have been well recognised by Sackett et al⁹ and others.¹⁰ Despite this, there remains a widespread perception that EBM requires high-level evidence, such as randomised controlled trials.

It is easy to misconstrue the resulting absence of evidence of benefit as being evidence of absence of benefit. The conclusions drawn from examining the evidence can be determined by the framing of the question and the standard of proof required — both of which can be controlled by those with established power or authority.

Are patients dying while we wait for evidence?

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The EBM website, Bandalier, comments: “The trouble is that people use phrases like ‘evidence-based medicine’, or ‘meta-analysis’ or ‘systematic review’ as some form of talisman. Attach one of these phrases to a point of view and an argument is won!”¹¹ Armed with the talisman of EBM, opponents of change can point to lack of evidence, or, if evidence is abundant and homogeneous, to weaknesses in study design. With apparent impartiality, other less convincing reasons for conservatism may be concealed.

Earlier in the ongoing MET debate, Buist et al reported on the introduction of a MET,⁷ with similar results to the study by Bellomo and colleagues. The extensive correspondence that the article by Buist et al generated drew attention to confounding factors, lack of applicability in other settings, failure to describe a mechanism of benefit, the use of historical controls, the possibility of a Hawthorne effect, and even accused the *British Medical Journal* of using an inaccurate and sensational cover title and a fake photo.¹² Many of these criticisms are justifiable in (inappropriately rigorous) EBM terms, but we may be seeing the “stainless steel” law of evaluation at work — the more rigorously the criteria for EBM are applied, the less the evidence that the intervention is effective.

Ellis (and Sackett) et al recognised the limitations of EBM in regard to life-saving treatment in emergency settings.¹³ In 1995 they acknowledged that certain interventions were “self-evident”, defined as interventions that, if omitted, would do more harm than good. “Face validity” may be accepted on the basis of “convincing non-experimental evidence”. This must be possible if innovation in acute, life-saving medicine is to continue.

Ethical aspects of EBM misapplied

There have been a number of recent critiques of EBM and ethics, including some by Australian authors.¹⁴⁻¹⁶ Many of the issues raised, including funding and service decisions, and impact on research activity, are of some relevance to the MET controversy.

Enthusiasm for EBM has grown at a time of increasingly overt economic constraint in healthcare. In this setting, EBM has been used as a justification for rationing decisions. At a national level, politicians have proposed that health funding should follow evidence (as defined by EBM).¹⁷ At a hospital level, “lack of evidence” may provide a useful justification to avoid shifting funds to facilitate system change, particularly for changes (such as a MET) that may result in “turf wars”.

Regardless of funding, “lack of evidence” may provide service managers or clinician leaders with a justification to avoid involvement in service activity they would prefer to avoid for reasons unrelated to patient welfare.

Uncritical application of EBM may also change the “respectability” of research or other activity that is not organised in the EBM paradigm. This may divert scarce resources (dollars, intellectual energy and enthusiasm) into research involving large randomised controlled trials. In many areas of healthcare, greater improvement in patient

outcomes could be achieved by locally focused effort, based on quality improvement or process redesign methodology. It is interesting to speculate on what else could have been achieved with the funds, energy and intellect that have been and are being expended on research to produce evidence about the MET system.

Implications for MET implementation

Most of the foregoing discussion may seem to be of interest to philosophers, but only a diversion to clinicians. But consider the implications of the “quest for evidence” with regard to the MET. The MET concept was established at Liverpool Hospital, Sydney, in February 1990. Reports of the initial results, and experience with the MET, were presented at various conferences after 1991, and formal publications in peer-reviewed journals were produced after 1995. The concept was generally accepted as a scientifically rational and clinically reasonable response to the challenge of acute in-hospital illness. No adverse clinical outcomes have been suggested, and the resource requirements for the MET system are modest.

Many would suggest that in a “reasonable” health system the MET system would have been introduced generally by (say) 1997, with appropriate audit of the effects of implementation. In fact, despite attracting international interest in the concept, introduction of the MET system in Australia has been patchy (about 25% of hospitals with ICUs). Many centres appear to be awaiting evidence — in particular, the multicentre trial of the concept sponsored by the Australian and New Zealand Intensive Care Society (the MERIT study) currently being conducted. But if the results of the study by Bellomo et al are extrapolated across Australia, introducing the MET system nationwide would prevent some 5000 hospital deaths annually. Could it be that thousands of Australians have died waiting for evidence to be collected to justify an intervention that is scientifically rational and clinically reasonable, with modest resource implications?

Appropriate evidence-based decision-making

All changes in healthcare have some risk of adverse outcomes, cost implications, and, once implemented, may be difficult to reverse. Clearly, decision-making must be based on something other than intuition or whim. It is appropriate to require some level of evidence for any decision (whether to change or to *not* change). But in some areas of medicine, it is unrealistic to ever expect evidence approaching the “gold standard”. In these areas, asking for “gold standard” evidence may be mischievous.

We propose that decisions about changes in healthcare should consider three Rs and two Es.

- Is the proposal scientifically **r**ational?
- Is it clinically **r**easonable?
- What are the **r**esource implications?
- Is there **e**vidence to guide our decision?
- What are the **e**thical implications?

The three Rs should allow the proposal to be broadly categorised on the basis of risk (including cost) and benefit. The requirement for evidence should be proportional to the apparent risk and benefit. For interventions with a high risk (cost) and marginal benefit, particular rigour may be worthwhile in assessing the evidence. Recent examples of such interventions include activated protein C¹⁸⁻²⁰ and cyclooxygenase-2 (COX-2) selective inhibitors,^{21,22} in which evidence was produced to support the intervention, but the cost of the evidence-based decision was high for a marginal benefit. If the evidence was even slightly flawed, the conclusion could have been very different. Conversely, in the case of interventions with high apparent benefit and low risk (including cost), it may be more illuminating to rigorously examine the motivation for opposition to the change, rather than accept as justified the demand for better or more evidence. We would suggest that the MET system fits the latter category.

Conclusion

There is no doubt that the “best available evidence” is an important component of medical decision-making. EBM should be seen as a powerful method to identify the best available evidence to assist decision-making. However, EBM is not an impartial or value-neutral force in modern medicine, and has as much capacity for abuse as any other double-edged sword forged by science. EBM should not be enlisted as a tool to prevent healthcare changes that may benefit patients but are uncomfortable or challenging to the established order.

In many areas of medicine, when considering possible interventions that are rational, reasonable, and with modest resource implications, it is appropriate to implement change without “absolute” evidence. It may even be unethical to delay change while inappropriately demanding more evidence. How many people should be allowed to suffer or die in the absence of “Level 1 evidence”, when reason suggests change, and our duty of care demands it?

Competing interests

The John Hunter Hospital is a participant in the MERIT study.

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