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YOU CANNOT MAKE INFORMED CHOICES WITHOUT INFORMATION

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Informed choices require information that is relevant, valid and accessible. Systematic reviews of the effects of alternative strategies provide information that is essential but not sufficient for recommendations about how best to manage mild brain injury or other problems. Work such as that of the Task Force on Mild Traumatic Brain Injury make decisions easier and better informed. To achieve better outcomes the information derived from systematic reviews needs to be applied critically and well-informed, context specific recommendations must be effectively implemented.

Key words: guidelines, systematic reviews, evidence-based decisions.

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INTRODUCTION

Patients, healthcare professionals and policymakers must make choices between alternative forms of care and alternative ways of using limited healthcare resources. Few people would prefer that these decisions should be uninformed. Yet, if a decision is going to be well informed rather than misinformed, we need information that is relevant, valid and accessible.

Often the problem is too much information rather than too little. For example, searching the World Wide Web for "mild brain injury" yields 155,000 hits (1). MEDLINE, the US National Library of Medicine's bibliographic database, contains over 11 million indexed journal citations and abstracts covering over 4500 journals published in more than 70 countries, and this represents only a fraction of the biomedical literature (2). The Cochrane Controlled Trials Register, a bibliographic database that is restricted to controlled trials of healthcare, contains over 360,000 citations (3). It is not practical, effective or an efficient use of resources for people making decisions about healthcare routinely to search through databases such as these to find the information that is relevant to a particular decision, assess the validity of the information they find, synthesize and interpret it.

For decisions about healthcare to be well informed we need reliable evaluations of the effects of alternative forms of care, systematic reviews of those evaluations, and guidelines based on those reviews.

WHAT IS A RELIABLE EVALUATION?

Dramatically effective healthcare interventions, such as insulin for diabetes, are not common. The majority of healthcare interventions are at best moderately superior to conventional care or a placebo. This is true for prevention, therapy and rehabilitation; and for health policy interventions as well as clinical interventions. Some interventions that are believed to be beneficial are, in fact, not effective and some are even harmful. For example, driver education has a long history as a strategy for preventing traffic injuries and school-based driver education has been widely advocated as a means of reducing traffic injuries among teenagers. Yet, the results of randomized trials of school-based driver education show that it leads to earlier licensing, no reduction in crash involvement, and may lead to a modest but important increase in the proportion of teenagers involved in traffic crashes (4).

The only way to judge the effects of healthcare is through comparisons, either comparing an intervention with no intervention or with alternative interventions. For the results of a comparison to be reliable it must be large enough to avoid random errors – misinterpreting chance associations as causal relationships – and rigorous enough to avoid systematic errors – bias. Bias in evaluations of healthcare interventions can arise from systemic differences in the groups that are compared, differential exposure to factors that affect outcomes besides the interventions of interest, exclusions of people entered into an evaluation, or differences in how outcomes are assessed (5). The validity of an evaluation reflects the degree to which the results are likely to be free from bias.

Judgements about the validity of evaluations of healthcare interventions are complex. There are no simple rules that can be used to make these judgements, even when considering only a single type of evaluation, such as randomized trials (6). However, there are both logical arguments and empirical evidence to support the use of randomized trials to evaluate healthcare interventions (7). Although it is possible to control for differences between comparison groups in observational studies, such as cohort studies and case-control studies, this is only possible for factors that are known and measured. Randomization is the only means of controlling for unknown and unmeasured differences as well as those that are known and measured. Randomization is not, of course, sufficient to ensure that the results of evaluations are valid and frequently randomized trials are not available to answer important questions.

Decisions about healthcare should be based on summaries of the best available evidence that is relevant. To ensure that these

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summaries are reliable, they should be compiled systematically and the methods that were used should be reported explicitly.

WHAT IS A SYSTEMATIC REVIEW?

Preparing a summary or review of the effects of healthcare entails many judgements. The focus of the review must be decided. Studies that are relevant to the focus of the review must be identified, selected for inclusion and critically appraised to assess their validity. Information must be collected and synthesized from the relevant studies, and conclusions must be drawn. Making these judgements systematically reduces the risk of making errors. Making them explicitly rather than implicitly enables others to appraise the extent to which the results of a review are likely to be valid (8).

For example, failure to conduct a thorough search for studies that are relevant to the focus of a review can result in important studies being overlooked or in a biased selection of studies due to reporting biases, such as publication bias (9). Non-systematic decisions about which studies to include in a review can result in studies being excluded because they do not support the pre-conceived opinions of the authors, and non-systematic analyses of the results of studies can result in small but important effects being overlooked or inappropriate weight being given to some studies in relationship to others. Relying on experts to synthesize the results of evaluations of healthcare is not a substitute for using systematic and explicit methods. Indeed, summaries prepared by experts are frequently not systematic and often are not consistent with the results of systematic reviews (10, 11).

WHY DO WE NEED GUIDELINES?

Guidelines for clinical practice are "systematically developed statements to assist practitioner and patient decisions about appropriate healthcare for specific clinical circumstances" (12). Evidence from systematic reviews of the effects of healthcare is necessary, but not sufficient for making informed decisions. At least 3 types of information and 3 types of judgements are needed for this (Fig. 1). Well-developed guidelines help people making decisions by organizing this information and these judgements. They do not eliminate the need for judgement on the part of those making decisions.

Fig. 1. Types of information and judgements needed for guidelines.

First, judgement is needed to identify health problems, to learn what health outcomes are important and to identify what preventive, diagnostic, treatment, rehabilitation or policy options should be considered. This information comes from epidemiological studies or from individual patients through history-taking, physical examination and diagnostic tests. Second, to estimate the effects of different options on health outcomes, judgements must be made about effectiveness and adverse effects. This information should come from systematic reviews of the best available evidence. Judgements must be made about both the validity and the applicability of this evidence (13).

These first 2 types of information and judgements taken together provide estimates of the expected outcomes associated with the options that are considered. It is then necessary to make judgements about trade-offs between the expected benefits, harms and costs. Sometimes formal economic or decision analysis is used to clarify the trade-offs (14, 15). Whether this is done formally or informally, information is needed about the "value" or desirability of the outcomes from the perspective of those who are affected.

HOW ARE GUIDELINES TRANSLATED INTO BETTER HEALTH?

These 3 types of judgements and information, taken together, form the basis for guidelines – recommendations about how to manage a health problem such as mild brain injury. For guidelines to be translated into better healthcare and health, appropriate decisions and actions must be taken. For this to happen, barriers to implementing appropriate actions must be identified and addressed (16). Knowing what to do is necessary, but not sufficient to ensure that the right things are done (17, 18).

WHAT SHOULD USERS OF GUIDELINES LOOK FOR?

Because medical knowledge and practise environments evolve continually, guidelines have a "shelf life" after which they should be reassessed. Users of guidelines should always check the shelf-date before applying guidelines.

The development of guidelines is a complex process involving multiple types of judgements and information; it is necessary to involve people with a variety of skills and perspectives. Guidelines developed by multidisciplinary groups are more likely to present balanced judgements than ones produced by specialists (19–24).

If decisions about how guidelines are developed are not made systematically and explicitly, regardless of who made the decisions, it is difficult to evaluate the adequacy of the methods that were used. Potential users of guidelines are then unable to make informed decisions about whether or not it is in the interest of

their patients or constituencies to adhere to the recommendations. As a result clinical practice, public health and patients may suffer. Unfortunately, guidelines frequently do not adhere to recommended methods for developing guidelines (23–25).

When guidelines give conflicting advice it can lead to confusion, aggravation and general mistrust of the guidelines. Although there can be legitimate reasons for divergent recommendations based on the same evidence, for example due to different local circumstances or different judgements about trade-offs, it is not possible for users to discern this, if the underlying information that was used and judgements that were made about local circumstances, the evidence and the trade-offs are not clearly described (26).

In summary, people should look for guidelines that are up-to-date, developed by multidisciplinary groups and based on systematic methods that are clearly reported. A lot of work goes into preparing good quality guidelines. When they are available they can save us a lot of time and help to improve the quality of healthcare and health outcomes. We should be grateful to groups such as the Task Force on Mild Traumatic Brain Injury who undertake this work. They make decision-making much easier. However, the work does not end here. It is now up to users of these guidelines to appraise them critically (26, 27), and implement them (16, 18), if the benefits of this work are to be realized.

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REFERENCES

1. Google [cited 2003 July 6]. Available from: URL: http://www.google.com/.
2. US National Library of Medicine. What's the difference between MEDLINE® and PubMed®? Fact sheet. US National Library of Medicine website [cited 2003 July 6]. Available from: URL: http://www.nlm.nih.gov/pubs/factsheets/dif_med_pub.html.
3. The Cochrane Library [CD-ROM]. Issue 2, Oxford: Update Software; 2003.
4. Roberts I, Kwan I. Cochrane Injuries Group Driver Education Reviewers. School-based driver education for the prevention of traffic crashes. The Cochrane Library [CD-ROM]. Issue 2, Oxford: Update Software; 2003.
5. Clarke M, Oxman AD. Assessment of study quality. Cochrane reviewers handbook 4.1.4 [updated 2001 Oct]. The Cochrane Library [CD-ROM]. Issue 1, Oxford: Update Software; 2002.
6. Jüni P, Altman D, Egger M. Assessing the quality of randomised controlled trials. In: Egger M, Smith GD, Altman D, eds. Systematic reviews in health care: meta-analysis in context. London: BMJ Books; 2001, p. 87–108.
7. Kunz R, Oxman AD. The unpredictability paradox: review of empirical comparisons of randomised and non-randomised clinical trials. BMJ 1998; 317: 1185–1190.
8. Oxman AD, Guyatt G, Cook D, Montori V. Summarizing the evidence. In: Guyatt G, Rennie D, eds. Users' guides to the medical literature: a manual for evidence-based clinical practice. Chicago: AMA Press; 2002, p. 155–173.
9. Egger M, Davey SG, Schneider M, Minder C. Bias in meta-analysis detected by a simple, graphical test. BMJ 1997; 315: 629–634.
10. Antman EM, Lau J, Kupelnick B, Mosteller F, Chalmers TC. A comparison of results of meta-analyses of randomized control trials and recommendations of clinical experts. Treatments for myocardial infarction. JAMA 1992; 268: 240–248.
11. Oxman AD, Guyatt GH. The science of reviewing research. Ann NY Acad Sci 1993; 703: 125–133.
12. Institute of Medicine (US). Committee to Advise the Public Health Service on Clinical Practice Guidelines. Field MJ, Lohr KN, eds. Clinical practice guidelines: directions for a new program. Washington, DC: National Academy Press; 1990.
13. Dans A, McAlister F, Dans L, Richardson WS, Straus S, Guyatt G. Applying the results to individual patients. In: Guyatt G, Rennie D, eds. Users' guides to the medical literature: a manual for evidence-based clinical practice. Chicago: AMA Press; 2002, p. 369–384.
14. Guyatt G, Straus S, McAlister F, Haynes B, Sinclair J, Devereaux PJ, et al. Incorporating patient values. In: Guyatt G, Rennie D, eds. Users' guides to the medical literature: a manual for evidence-based clinical practice. Chicago: AMA Press; 2002, p. 567–582.
15. O'Brien B, Drummond M, Richardson WS, Levine M, Heyland D, Guyatt G. Economic analysis. In: Guyatt G, Rennie D, eds. Users' guides to the medical literature: a manual for evidence-based clinical practice. Chicago: AMA Press; 2002, p. 621–644.
16. Oxman AD, Flottorp S. An overview of strategies to promote implemention of evidence-based health care. In: Silagy C, Haines A, eds. Evidence-based practice in primary care. 2nd edn. London: BMJ Publishers; 2001, p. 101–119.
17. Oxman AD, Thomson MA, Davis DA, Haynes RB. No magic bullets: a systematic review of 102 trials of interventions to improve professional practice. Can Med Assoc J 1995; 153: 1423–1431.
18. Grimshaw JM, Shirran L, Thomas R, Mowatt G, Fraser C, Bero L, et al. Changing provider behavior: an overview of systematic reviews of interventions. Med Care 2001; 39 (8 suppl 2): II2–45.
19. Coulter I, Adams A, Shekelle P. Impact of varying panel membership on ratings of appropriateness in consensus panels: a comparison of a multi- and single disciplinary panel. Health Serv Res 1995; 30: 577–591.
20. Herrin J, Etchason JA, Kahan JP, Brook RH, Ballard DJ. Effect of panel composition on physician ratings of appropriateness of abdominal aortic aneurysm surgery: elucidating differences between multispecialty panel results and specialty society recommendations. Health Policy 1997; 42: 67–81.
21. Murphy MK, Black NA, Lamping DL, McKee CM, Sanderson CF, Askham J, et al. Consensus development methods, and their use in clinical guideline development. Health Technol Assess 1998; 2: 1–88.
22. Fretheim A, Williams JW, Jr, Oxman AD, Herrin J. The relation between methods and recommendations in clinical practice guidelines for hypertension and hyperlipidemia. J Fam Pract 2002; 51: 963–968.
23. Grilli R, Magrini N, Penna A, Mura G, Liberati A. Practice guidelines developed by specialty societies: the need for a critical appraisal. Lancet 2000; 355: 103–106.
24. Savoie I, Kazanjian A, Bassett K. Do clinical practice guidelines reflect research evidence? J Health Serv Res Policy 2000; 5: 76–82.
25. Shaneyfelt TM, Mayo-Smith MF, Rothwangl J. Are guidelines following guidelines? The methodological quality of clinical practice guidelines in the peer-reviewed medical literature. JAMA 1999; 281: 1900–1905.
26. Guyatt G, Hayward R, Richardson WS, Green L, Wilson M, Sinclair J. Moving from evidence to action. In: Guyatt G, Rennie D, eds. Users' guides to the medical literature: a manual for evidence-based clinical practice. Chicago: AMA Press; 2002, p. 175–199.
27. Sackett DL, Oxman AD. Guidelines and killer B's. Evid Based Med 1999; 4: 100–101.