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Review Article

Evidence-based health care: A roadmap for knowledge translation

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Abstract

Evidence-based health care informs clinicians of choices regarding the most effective care based on the best available research evidence. However, concepts or instruments of evidence-based medicine are still fragmented for most clinicians. Substantial gaps between evidence and clinical practice remain. A knowledge translation roadmap may help clinicians to improve the quality of care by integration of various concepts in evidence-based health care. Improving research transparency and accuracy, conducting an updated systematic review, and shared decision making are the key points to diminish the gaps between research and practice.

Keywords: Evidence-based health care; Health care policy; Knowledge translation; Shared decision making; Systematic review

1. Introduction

Since evidence-based medicine (EBM) was coined by Gordon Guyatt in 1992,[1] it has flourished because of a confluence of events and changes in clinical culture. Evidence-based health care (EBHC) informs clinicians of choices regarding the most effective care based on the best available research evidence. The core competencies endorsed by The Accreditation Council for Graduate Medical Education (ACGME) require the residents to demonstrate the ability to investigate and evaluate their patient care practices, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and life-long learning.[2] However, substantial gaps between evidence and clinical practice remain. Collecting, appraising, and managing clinical research generate substantial challenges for most clinicians. Despite of convincing evidence, clinicians often neglect to integrate the right care into practice particularly when customary care has been established.

Many EBM practitioners have strived to diminish the gaps of knowledge translation by formulating a 5-step model of bedside EBM,[3] establishing diversified databases, producing high-quality systematic reviews, and exploiting reporting guidelines. However, these concepts or instruments are still obscure, complex, and fragmented for most clinicians. A clear, brief, and coherent knowledge translation roadmap may help clinicians to make better the quality of care by integration of various concepts in EBHC. The model illustrates the keystones of knowledge translation from research to practice.

Conflicts of interest: The authors declare that they have no conflicts of interest related to the subject matter or materials discussed in this article.

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2. Asking/subscribing

The conventional process of EBM starts from asking focused questions. However, such an approach is limited by personal knowledge and experience of the inquirer. Alternatively, subscriptions to medical databases enable busy health care professionals to stay up to date with the latest medical research on a daily basis. Establishing an account (My NCBI) in PubMed for obtaining new literature in a specialized field, and receiving information about paramount new research after critical appraisal from the leading medical journals through email alert systems such as McMaster PLUS, are essential.[4]

3. Acquiring evidence

Numerous databases and resources have advanced the search process to let clinicians acquire the literature in a convenient manner. However, in some underserved countries, clinicians can only obtain the abstracts of scientific papers. The current trend of publishing articles in open access has facilitated the spread of knowledge. The other barrier to gain knowledge is language, but this can be overcome by the availability of high-quality translations produced by organizations in non-English-speaking countries.

4. Appraising critically

Many appraisal tools, such as Critical Appraisal Skills Programme (CASP) checklists[5] and Cochrane's risk of bias table,[6] have been developed for clinicians to critically appraise the methodological quality of research. In addition, the "level of evidence" of the Oxford Centre for EBM was produced to make the process of finding appropriate evidence feasible, and its results are explicit.[3] However, based on personal experience and with the help of tools, a clinician can identify only the biases of selection, performance, detection, and attrition. Thus, reporting and publication biases must be underlined by other strategies before publishing trials.

5. Improving research transparency and accuracy

More and more biomedical journals support clinical trial registration policies. Trial registration is known to improve research transparency and strengthen the validity and value of scientific evidence. Because thousands of clinical trials have not been registered or reported their results, the AllTrials campaign urges governments, regulators, and research bodies to register all the trials, and report the full methods used and their results.[7] Moreover, journals for negative results and for protocols may diminish the nonpublication of results, and prevent publication bias.

Reporting guidelines, such as Consolidated Standards of Reporting Trials (CONSORT), are known to improve the reliability of medical research literature by promoting the accurate reporting of research studies. In the future, more reporting guidelines will be established in specific disciplines, with different core outcome measurements.

6. The need for systematic reviews

Evidence from a single trial is often insufficient to inform decision-making (dotted line in Fig. 1), and standard pairwise systematic reviews are needed to help clinicians integrate evidence from the trials (solid line in Fig. 1). If no systematic review has been published, clinicians could conduct an updated systematic review, or at least assess all relevant studies, and if evidence is inconclusive, clinicians should always practice with cautions, and wait for additional evidence.

Today, increasingly complex forms of systematic review and meta-analysis have been published. Network meta-analyses indirectly compare the results from various trials to estimate the relative effectiveness of competing treatments. Furthermore, meta-analyses of individual participant data enhance the ability to detect differential treatment effects across patients in randomized trials.

7. Effect of clinical practice guidelines

Clinical practice guidelines (CPGs) have been defined as systematically developed statements to assist practitioner and patient decisions regarding appropriate health care in specific clinical circumstances. CPGs are not cookbooks or textbooks, and CPG recommendations must always be evidence-based. The Appraisal of Guidelines, Research and Evaluation for Europe (AGREE) is a tool used for thorough assessing the quality of guidelines, and has become the standard of appraising the developed guidelines.[8] Grading of Recommendations, Assessment, Development, and Evaluations (GRADE) is a method used by guideline developers to rate the quality of evidence and strength of recommendations.[9] GRADE indicates that any recommendation must be derived from the level of evidence, balancing both desirable and undesirable effects, cost-effectiveness, and the preferences of patients.

8. Applying the evidence

Even if the evidence is strong enough, gaps between knowledge and decision-making occur at all levels of health care. An "evidence pipeline" model has been described to involve 7 stages (awareness, acceptance, application, ability, acting on, agreeing to, and adhering to) from evidence to action.[10] To ease the burden of awareness and acceptance, EBM journal clubs are used by health care practitioners to keep on tracking of current relevant literature, critically appraise the literature, and decide rationales in the literature could be applied to their own practice.[11] To apply, enable, and act on the accepted evidence, a team for improving health care quality can be formed, based on the principles of the plan-do-check-act cycle, to facilitate the development of a training and education program. For the patients to agree on and adhere to recommendations, the values underlying their culture, religion, socioeconomic status, and personal preferences must be co-constructed within a shared deliberation process (shared decision making) that involves using decision aids, using nontechnical language, and enlisting social support from family and friends.[12]

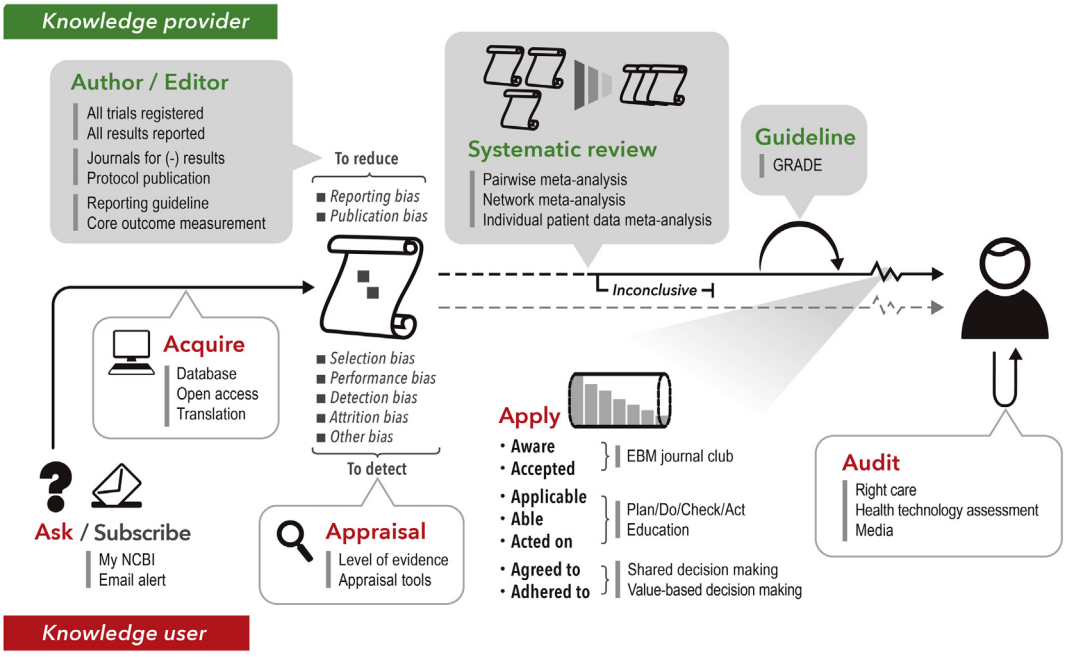

Fig. 1. Roadmap of knowledge translation.

9. Auditing the performance

The right care concept is essential for an efficient care.[13] Thus, cautions on overuse (over-diagnoses and over-treatment) as well as underuse must always be considered by health care providers. Assessment of a health technology based on a multidisciplinary field of policy analysis may achieve the formulation of safe, cost-effective, and patient-centered health policies. Finally, EBHC needs to be propagated to the public through the media.

In conclusion, this roadmap attempts to integrate the current key elements in EBHC, and outline strategies for a successful knowledge translation. New EBM concepts are anticipated to diminish the gaps between research and practice.

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