

Translating Evidence-Based Decision Making into Practice: EBDM Concepts and Finding the Evidence

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This is the first of 2 articles that focuses on strategies that can be used to integrate an evidence-based decision making [EBDM] approach into practice. The articles will focus on EBDM methodology and enhancing skills, including how to find valid evidence to answer clinical questions, critically appraise the evidence found and determine if it applies. In addition, online resources will be identified to supplement information presented in each article.

The purpose of this article is to define evidence-based decision making and discuss skills necessary for practitioners to efficiently adopt EBDM. It will provide a guide for finding evidence to answer a clinical question using PubMed's specialized searching tools under Clinical Queries.

Keywords: Evidence-based Decision Making (EBDM), PubMed, PubMed Clinical Queries, Systematic Reviews.

EBDM DEFINED

EBDM is defined as the formalized process of using the skills for identifying, searching for, and interpreting the results of the best scientific evidence, which is considered in conjunction with the clinician's experience and judgment, the patient's preferences and values, and the clinical/patient circumstances when making patient care decisions. EBDM is not unique to medicine or any specific health discipline, but represents a concise way of referring to the application of evidence to the decision-making process (Fig. 1).

An evidence-based approach has emerged in response to the need to improve the quality of health care and to close the gap between research and practice.^{2,3} Evidence-based practice has been defined as, "the integration of best research evidence with clinical expertise and patient values."¹ This definition is further clarified by defining each of the 3 major concepts—best evidence, clinical expertise, and patient values. For example, "*best research evidence*" refers to clinically relevant research, especially from patient-centered clinical research. *Clinical expertise* means

the ability to use clinical skills and past experience to rapidly identify each patient's unique health state and diagnosis, individual risks and benefits of potential interventions, and personal values and expectations. *Patient values* refers to the unique preferences, concerns, and expectations that each patient brings to a clinical encounter and that must be integrated into clinical decisions if they are to serve the patient."¹ In other words, the use of current best evidence does not replace clinical skills, judgment, or experience, but rather provides another dimension to the decision-making process that also considers the patient's preferences. Thus, scientific evidence is considered by the practitioner in the context of an individual patient's circumstances when it is appropriate.

Several professions have adapted this definition to make it specific to their discipline. For example, the American Dental Association (ADA) defines evidence-based dentistry (EBD) as an approach to oral health care that requires the judicious integration of systematic assessments of clinically relevant scientific evidence, relating to patient's oral and medical condition and history, with the dentist's clinical expertise and the patient's treatment needs and preferences.⁴

EVIDENCE-BASED PRINCIPLES AND LEVELS OF EVIDENCE

EBDM is about solving clinical problems and involves 2 fundamental principles:

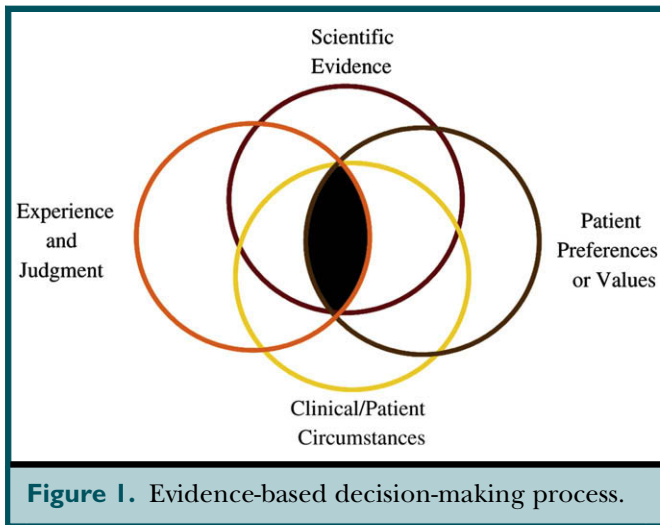
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1. Evidence alone is never sufficient to make a clinical decision, and
2. A hierarchy of evidence exists to guide clinical decision making.⁵

The hierarchy of clinical evidence for treatment questions is based on demonstrating that the intervention or treatment caused the effect, and the ability to control or minimize bias (Fig. 2).^{6,7}

The highest levels of evidence or “gold standard” for treatment questions are the systematic review and meta-analysis (synthesis of 2 or more randomized controlled trials [RCTs] answering the same question). Also considered Level 1 evidence is an individual RCT. These are followed re-

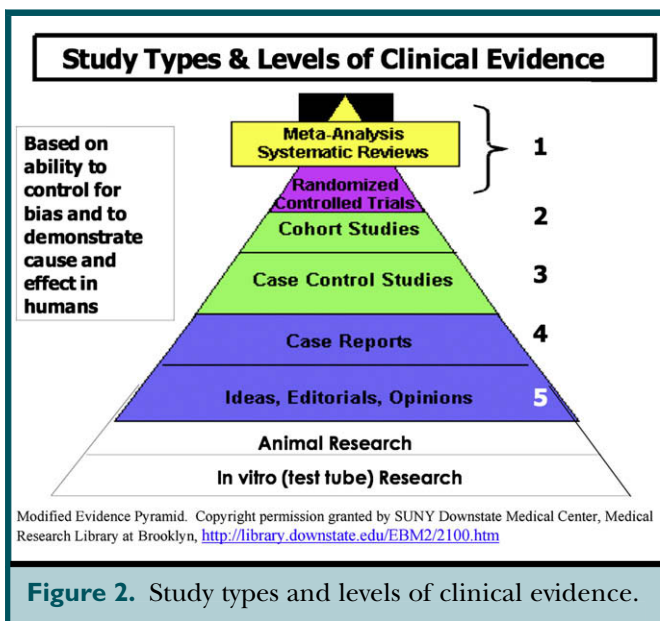
spectively by cohort studies (Level 2), case-control studies (Level 3), and case reports (Level 4) to studies not involving human subjects. An excellent short, graphic review of each research method can be found at the SUNY Downstate Medical Center, Evidence-Based Medicine Course, Guide to Research Methods - The Evidence Pyramid:⁸ <http://library.downstate.edu/EBM2/2100.htm>

Systematic reviews (SRs) and meta-analyses (MAs) are considered the gold standard for evidence because of their strict protocols to reduce bias and to synthesize and analyze already conducted studies that address the same question. A meta-analysis is a statistical tool commonly used with SRs. It involves combining the statistical data from the individual studies and conducting another analysis of the combined data. When the data are pooled from individual studies, the sample size and power usually increase. As a result, the combined effect can increase precision in estimating the effects of treatment.^{9,10}

SRs and MAs facilitate decision making by providing a clear summary of the current state of the existing evidence on a specific topic. With more than 2 million articles published annually, SRs provide a way of managing large quantities of information¹⁰ and make it easier to keep current with new research. SRs also support the development of clinical practice guidelines by putting together all that is known about a topic in an objective manner. Most recently, evidence-based (EB) methodology was used by the American Heart Association to update the Guidelines for the Prevention of Infective Endocarditis,¹¹ by the ADA for the Guidelines on Professionally Applied Topical Fluoride: Evidence-Based Clinical Recommendations,¹² and by the Canadian Dental Hygienists' Association on Toothbrushing and on Commercially Available OTC Rinsing Products.¹³

Although they are a secondary source of information because they synthesize already conducted research, SRs contain clear descriptions of the aims of the review, the material and methods, and a summary of the individual and combined results of the studies.⁹ Systematic reviews include evidence from RCTs, as well as other well-controlled methods. As valuable as SRs can be, their usefulness and the strength of the evidence derived from the SR depends on the quality of the previously published original studies, ie, their ability to meet the eligibility requirements for inclusion in the SR.

Systematic reviews differ from traditional literature reviews in that they concentrate on answering a specific clinically focused question, making them narrower in scope than a literature review. A multidisciplinary team of experts in a given area generally conducts the review.⁹ They use formal and explicit methods, and specify criteria for including or excluding studies in the review, which is designed to reduce bias. The methods used to conduct a systematic review surpass what can reasonably be expected of any one individual.



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