

## Shoemaker Certification - Evidence Based Medicine

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Evidence Based Medicine is a paradigm originally established by the McMaster University research group led by Drs. David Sackett and Gordon Guyatt strongly influenced by Professor Archie Cochrane's advocacy of this concept in his landmark book "Effectiveness and Efficiency: Random Reflections on Health Services" in 1972 (1) (2). It incorporates the integration of clinical expertise, patient values and best available evidence to expedite the optimal outcome of health care; or more specifically, successfully treating the ravages of disease so that they are eradicated, or at least, significantly diminished so as to allow a patient the ability to function both mentally and physically with the least amount of inhibition or restriction.

The McMaster Group for Evidence Based Medicine (EBM) proposed a five-step approach for its implementation: 1) Problem Identification, 2) Search for Sources of Information, 3) Critical Evaluation of Information, 4) Application of Information to the Patient, 5) Efficacy Evaluation of this Application (3). The first step, defining the problem, should be focused on formulating answerable questions centered on a relevant population, management and intervention strategies, comparison of strategies with alternative options and consequences of treatment. Steps 2 and 3 incorporate the utilization of the medical literature pertinent to answering the questions raised in Step 1. A plethora of information is available, unfortunately not all well researched; and furthermore, often too voluminous to adequately digest by busy providers. Ideally, careful assessment of the methodology, design, analysis, and conclusions are used to interpret the data so that applicability and care can be formulated. The most reliable literature would focus on the strength of evidence, preferably extracted from large randomized controlled clinical trials rigorously reviewed by peers in which to guide providers a systematic design for the treatment – the application of information to the patient. After exercising the treatment protocol based on steps 1 through 4, the efficacy of implementation of the paradigm must be evaluated to answer the pertinent questions: has the diagnosis been accurate, symptoms alleviated, disease eradicated, and prognosis improved? Naturally, these goals are not always completely achievable, but if thorough application has been utilized, a measure of success should be observed.

From the diligent process exercised through EBM, a basis for reproducible observations in an unbiased manner should enable uniform adherence by providers to manage care of their patients. EBM should not be construed, as such, an all-encompassing concept so as to exclude the importance of clinical experience and the development of clinical skills, but rather as an adjunct so that evidence is understood to correctly interpret the literature on causation of disease, prognosis, testing, and therapy. As might be expected, treatment success and perception of well-being are difficult to quantitate. Patients vary with respect to personality, motivation, and trust which certainly influence responses to physical (incisional, excisional, percutaneous, rehabilitative, etc.), medicinal (chemotherapeutic, antibiotic, anti-inflammatory, pain mediation, etc.), and mental (psychotherapeutic) interventions, among others. It is of little wonder, that to navigate such a tortuous path is difficult at best, but worthwhile nonetheless. Given the complexity of the human body, the vast amount of medical knowledge yet to be obtained from investigation, study, or instruction is important to recognize. It thus behooves

providers to accept the challenge while using what is known to formulate a process to treat all patients with the best regimen proposed based on the evidence that is currently established. The concept of EBM is susceptible to variation upon yet undiscovered data and outcomes. New studies may provide additional tools which could modify or even change currently held dogma requiring reassessment of protocols thought to be unassailable. For this reason, it is incumbent upon providers, professional boards, agencies, and the medical profession in general to continue recurrent review of the literature of documented clinical evidence for updated recommendations, clinical policies, treatments, and procedures.

For all of the benefits of EBM, there remains that part of medicine to which this concept cannot be easily applied. Patients are still individuals, and as such, their condition may not always be simply codified into one disease category. Many other factors may influence the effectiveness of therapy despite following a recommended evidence based protocol. It remains pertinent that a provider's judgement, abetted by years of medical training and experience, be used to coordinate the ability to decipher the large amount of published material into a cogent, objective and intuitive plan for successful management of the presented condition. Indeed, the previously held belief that a certain pathogen may have triggered a particular illness may be proved incorrect. Likewise, some diseases may only be expressed in a particular individual based on genetic alteration or mutations. It is therefore inherent for one to possess some restraint in categorically classifying a set of symptoms and its management as if it were applicable to all by remedy through a simple recipe of treatment options when definitive EBM is inconclusive. Some conditions are not amenable to the application of EBM because the incidence in the population is too infrequent for large studies to be performed potentiating the risk of inaccurate or misleading conclusions...a situation which could result in doing more harm than good. Additionally, unintentional bias may pervade, and sometimes obscure, the ability of researchers, agencies, and forces within established doctrine to cast objective insight into investigating the etiology and treatment of previously unreported clusters of clinical findings and symptoms. This tendency to hedge preconceived perceptions toward explanations in established dictum thwarts impartial exploration and investigation, an example often seen when political, economic, or other external forces influence the direction of study. It sometimes takes a determined and unabashed persistence utilizing a scientific approach, regardless of the consequences, to accomplish the goal of discovering the correct answer to the original question. In essence, this is the central foundation of Evidence Based Medicine.

- 1) Masic, I. Miiokovic, M. & Mukamedagic, B. Acta Informatica Medica 2008; 16(4): 219-225
- 2) Stavrou, A. Challoumas, D. & Dimitrakis, G. Interactive Cardiovascular and Thoracic Surgery 2014; (18): 121-124
- 3) Evidence Based Medicine Work Group: Evidence Based Medicine-A New Approach to Teaching the Practice of Medicine. JAMA 1992; 268: 2420-2425