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From the Editor

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Higher Quality at Lower Cost: Is Evidence-Based Medicine the Answer?

Like many clinicians, I often feel overwhelmed by the explosion of scientific knowledge. I know that I cannot possibly keep up with the medical literature and synthesize all of the information available to me in an efficient and practical manner. The electronic medical record, with all of its promised efficiencies, has really yet to materialize in a practical sense. Added to these woes is a natural reaction to bristle at yet another new term in our medical lexicon, namely, evidence-based medicine (EBM). What is the etiology of this conveniently labeled phenomenon? How might it help us to achieve our long sought-after goal of providing our patients with higher quality care at a lower economic burden? What are the future prospects for this field in general?

I am not aware of any published reports formally outlining the etiology of EBM. By most accounts, one can trace its origins to a group of dedicated clinician teachers at McMaster University in Ontario, Canada, in the late 1980s. At McMaster, a core group of medical school faculty was trying to demonstrate that medical decisions should be based on a physician's clinical experience as well as a distillation of the best evidence from research to guide individual clinical choices. Early on, they defined EBM as "a conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients"[1] - surely a definition most clinicians would readily embrace. Before outlining the core methodology of EBM, let me pose the obvious question: What's the evidence that we need it?

Regrettably, the evidence about our need to practice a more methodologically rigorous style of practice is overwhelming. A recent editorial in *Annals of Internal Medicine*[2] nicely summarizes two decades of accumulated evidence about unexplained clinical variation in physician decision making. The authors demonstrate that when employers look at the delivery of healthcare, rather than seeing a well-ordered, knowledge-based system, they see chaos. For example, a large employer in the Midwestern U.S. finds that their employees in Flint, Michigan are 70% more likely to undergo cardiac revascularization than their employees in Grand Rapids, despite their employees having similar insurance. Dozens of well-done studies have documented variation across small and large areas of the country in surgical procedures, healthcare capacity, use of pharmaceuticals in chronic conditions, and the intensity of diagnostic testing. The authors label this "medical care where geography is destiny."

This kind of information, once restricted to scholarly medical journals, has found its way into the popular press. Witness the recent Sunday *New York Times Magazine* story entitled, "Checking Medicine's Vital Signs," by a member of the *Times* editorial board.[3] This exceedingly well written two-page review captured all of the drama of unexplained variation by likening it to three jumbo jets crashing every two days, in order to highlight the number of patients killed every year because of missed diagnoses, medication mishaps, and other preventable errors. Finally, one of the nation's leading healthcare quality experts has recently pointed out that the problem we now face represents the obverse side of an extraordinary success story.[4] Let me explain. In the past 25 years, we have generated an immense amount of new

knowledge about what works to improve healthcare and what does not. One crude index of the pace of this change might be the publication of the randomized controlled trial-the gold standard for evaluating the efficacy of healthcare interventions or all sorts. Surprisingly, the randomized controlled trial is a very recent phenomenon, with the first one published in 1952. In the 30 years from 1966 through 1995, more than 76,000 journal articles were published from randomized controlled clinical trials. The first five years of that time period contributed less than one percent of the total, whereas the last five years have contributed more articles than the previous 25 combined. Therefore, one must realize, in the face of this avalanche of rigorous data on efficacy, that the methods of training physicians and other clinicians and our systems for supporting them in the delivery of healthcare service have not kept pace. Simply put, our rigorous clinical training has not equipped clinicians to make maximal use of a variety of methods-not just randomized control trials-to assess and improve our own practice.

So, how can EBM help us with this quandary of too much information for our own good? Sackett and his colleagues, in an outstanding and easy to read book, may provide some the answers to these queries.[1] How, then, do we go about practicing EBM? There are five key steps: We must: 1) convert our information needs into answerable questions; 2) track down with maximum efficiency the best evidence with which to answer them from all sources; 3) critically appraise the evidence for its validity and usefulness; 4) apply the results of this appraisal in everyday practice; and 5) most importantly, we must evaluate our performance and feed this information back to ourselves and our colleagues.[1] These are laudable goals for sure. Yet, many naysayers would ask, Why should we bother with EBM despite the aforementioned evidence about unexplained clinical variation and the explosion of scientific knowledge?

Sackett outlines five principal reasons why we should adopt EBM.[1] Let me outline them: 1) New types of evidence are now being generated, which when we know and understand then, create frequent major changes in the way we care for our patients. Fortunately, we now have modern tools for dissecting, understanding, and objectifying the diagnostic reasoning skills of expert clinicians. In other words, we can sort out with modern tools how skilled doctors think and apply these rigorous systems to our own sometimes-disjointed thinking. 2) Although we need this new information daily, we usually fail to get it. The research evidence shows that only about 30% of our daily information needs are readily met in the Department setting. Therefore, we must find a way to adopt the tenets of EBM and bring this information to the bedside in a more efficient and practical manner. 3) Our up-to-date knowledge and clinical performance definitely deteriorates with time. There is ample research evidence to show that performance is closely linked to the year of graduation from medical school, and that recall and competency in many fields deteriorates over time. 4) Unfortunately, traditional Continuing Medical Education simply does not work. There is a growing body of evidence, summarized effectively in the book, The Physician as Learner, [5] by Dr. David Davis, outlining the pedagogic failure of traditional lecture-based CME. 5) Finally, a different approach has clearly been shown to be more effective. This approach-the adoption of the tools of EBM-means we must master new types of learning skills. We must seek and apply summaries of practice generated by others, and we must accept EBM protocols developed by colleagues. Once we adopt the tenets of EBM, we can then apply them toward the implementation of other tools, such as academic detailing, the identification of key physician champions, internal and external benchmarking about our performance, and finally create robust clinical practice profiles of individual physician practice

behavior for non-punitive feedback about their performance, especially at the local level.

What, then, is the future of EBM? Dr. Jordan Cohen, the current president of the Association of American Medical Colleges, writing in a recent issue of *Academic Medicine,*[6] noted that the practice of medicine is about to be revolutionized by the convergence of two immensely powerful developments: information technology and evidence-based decision making. Dr. Cohen sees a world where "the rapid development of computer-assisted decision support programs and the mounting efforts to provide "evidence-based guidelines" could help position the future doctor to provide his patients with care of proven value, i.e., of the highest quality at the lowest possible cost."[6] He goes on to note that by adopting the cost-saving and quality-improving approaches made possible by evidence-based, computer-assisted practice, "medical schools and teaching hospitals especially will be assuming nothing less than their rightful place in the vanguard of progress toward a more accountable healthcare system."[6] Furthermore, the federal Agency for Healthcare Policy and Research (AHCPR) seems to have fully embraced the tenets of evidence-based practice. Indeed, AHCPR has created a national network of a dozen Evidence-Based Practice Centers, or EPCs. EPCs are seen as the logical successor to the Agency's previous guideline activities. These dozen EPCs will be asked to produce evidence reports on selected topics; that is, a careful analysis that can be used to develop guidelines, performance measures, educational materials, and other quality improvement programs. The EPCs represent a mix of academic institutions and private organizations with national and international reputations for their work on systemic reviews, metanalyses, and technology assessment. It is hoped that the EPCs will build on the work started years ago by the so-called Cochrane Collaboration. The Cochrane Collaboration is a multi-center, international project that attempts to synthesize all controlled trials of healthcare intervention and goes beyond the literature, which has been shown to be biased toward English-language positive outcome reports. Cochrane participants seek out all trials in all languages including negative and unpublished trials.

To me, the evidence to support evidence-based practice is axiomatic. I know we are capable of providing higher quality care-care given to the appropriate patient at the appropriate time with appropriate resources to garner the best possible outcome at the lowest possible cost. I know that better antibiotic selection, for example, will lead to fewer allergic reactions, fewer instances of excessive dosage and attendant toxicity, higher likelihood of bacterial susceptibility, and lower costs. We can broaden these examples to encompass virtually all of our bedside and office-based decision making. From my perspective, evidence-based medicine is the essence of professionalism.

As usual, I am interested in your views.

- David B. Nash, MD, MBA

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