

Scientific Evidence and Medical Practice

The “Drunkard’s Walk”

IN HIS RECENT BOOK *“THE DRUNKARD’S WALK: How Randomness Rules our Lives,”*¹ Leonard Mlodinow describes how humans are notoriously bad at, and often even averse to, the straightforward use of data and probability in making daily judgments. This characteristic is not restricted to certain educational levels, sexes, or professions. Despite its image of being scientifically based, the actual application of evidence in medicine is, like a drunkard’s walk, quite haphazard and inconsistent. Social scientists have long documented that new medical products and practices disseminate into health care more because of power and money than scientific evidence.² In more than 3 decades since the formal development and teaching of “evidence-based medicine” (EBM), the amount of evidence routinely incorporated into various practice types (complementary or conventional) and settings varies wildly. In 1991, it was estimated that approximately 15% of medical interventions were supported by solid scientific evidence.³ A more recent summary of the percentage of decisions in various medical specialties that follow the rules of EBM ranges from 11% to 70%⁴; These are hardly ringing endorsements of medicine as science. Subspecialists and inpatient practices tend to be better grounded in evidence, possibly because they have a more narrow focus and the nature of the “best” evidence comes from patients with more homogeneous problems entered into randomized controlled trials (RCTs) rather than the more complex patients seen in general practice.⁵

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It is often thought that practitioners of complementary and alternative medicine (CAM) are less scientific and therefore less likely to be aware of and use the results of research evidence than their conventional counterparts.⁶ In a study published in this issue of the *Archives*, Tilburt and colleagues⁷ have examined some of those assumptions in a cross-sectional survey of CAM and conventional physicians’ knowledge and attitudes of research use in practice. They report that more than 75% of practitioners of any type (CAM or conventional) were unaware of 2 high-profile National Institutes of Health-funded studies on conditions relevant to their practices. In addition, most practitioners were not “very confident” in their interpretation of research results. In contrast to acupuncturists and naturopaths, however, the majority of internists and rheumatologists rated RCTs as “very useful” and patient preferences as “least important” in research interpretation. While sampling and analysis in

this study were good, we cannot use the results of this study to make general comparisons of the use of evidence between CAM and conventional care. First, the study did not measure the actual use of evidence in practice—only attitudes to types of evidence—and it did not sample chiropractors, the largest group of CAM practitioners with the most number of condition-specific RCTs. Actual use of evidence in these and other practices still needs to be investigated.

However, this study of Tilburt et al⁷ highlights another crucial issue that medicine needs to face if it truly believes in advancing evidence-based practice.⁸ Even when the rules of EBM are known and accepted, many physicians do not use these rules routinely. Primary care physicians appear to value evidence types differently than taught in standard EBM and in a way more consistent with the CAM practitioners in the study by Tilburt and colleagues.^{7,9} Gabbay and le May¹⁰ performed an in-depth observational study of how physicians and nurse practitioners use evidence in making clinical decisions. Rather than systematic evaluation of current evidence from RCTs or even the use of current guidelines, conventional primary care practitioners rely on what Gabbay and le May called “mindlines.”¹⁰ Mindlines involved using tacit, internal guidelines derived from physicians’ own experiences and the opinion of colleagues in “communities of practice.” Indeed, physicians often distrusted the results of RCTs as relevant for the patients they see and instead used opinions of trusted peers.

Since rheumatologists were aware of and valued research evidence more than most, one way of interpreting the data from Tilburt et al⁷ is that more exposure and training in academic medicine is needed if EBM is to become more widely used in CAM. However, such training may risk making practitioners less flexible and less “patient centered” by reducing the value they give to patient preferences. If so, there is something wrong with not only the amount of EBM training done but the way we teach EBM. If we are to teach more EBM to physicians, we need to broaden and deepen our understanding of what counts as “evidence” and which types of evidence are best used to inform differing aspects of clinical decision making.¹¹ For example, the current emphasis in primary care on the “patient-centered medical home” calls for physicians to attend to patients as “whole persons,” with all of their complex reasons regarding illness and recovery. Many of these reasons are not additive or isolated in controlled experiments.¹² The best evidence under these circumstances may not be RCTs but probability data derived from observational studies in clinical

practice.¹³ Thus, physicians need training in collecting and using this type of evidence. Patient-centered care means attending to the psychological and social aspects of illness that cannot be reduced to single, objective measures.¹⁴ Evidence about patient preferences might only be captured with qualitative research, not questionnaires or blood tests.¹⁵ Thus, to be both patient centered and evidence based, physicians need to know how to distinguish good qualitative research from bad. At other times the “best” evidence may come from basic science. As “systems medicine” using personalized genomic and metabolic data emerges, physicians will need to have skills in the interpretation of laboratory data to practice good EBM.¹⁶

Rather than imposing an academic, hierarchical structure on medical decision making, EBM should seek to inform the processes practitioners actually use in making clinical decisions to more effectively incorporate science into practice. Not everyone can or should become a subspecialist or academic physician; however, it is clear that physicians and CAM practitioners need significantly more training in interpreting the full range of evidence types (including quantitative and qualitative data) in practice. That is, physicians need to know how to use a complete “evidence house” and not just the “evidence hierarchy” currently dominating EBM in both conventional and complementary medicine.^{17,18} As with any skill, sufficient time and supervised application is needed before EBM can become a habit in daily practice.⁸ Thus, both CAM and conventional practitioners should each seek to fill their respective gaps in knowledge and skills to make practices both more patient relevant and scientifically rigorous.

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REFERENCES

1. Mlodinow L. *The Drunkard's Walk: How Randomness Rules our Lives*. New York, NY: Pantheon Books; 2008.
2. McKinlay JB. From “promising report” to “standard procedure”: seven stages in the career of a medical innovation. *Milbank Mem Fund Q Health Soc*. 1981; 59(3):374-411.
3. Smith R. Where is the wisdom . . . ? *BMJ*. 1991;303(6806):798-799.
4. Pelletier K. Conventional and integrative medicine: evidence based? sorting fact from fiction. *Focus Alternative Complement Ther*. 2003;8(1):3-6.
5. Gill P, Dowell AC, Neal RD, Smith N, Heywood P, Wilson AE. Evidence based general practice: a retrospective study of interventions in one training practice. *BMJ*. 1996;312(7034):819-821.
6. Ernst E, Kaptchuk TJ. Complementary medicine—the case for dialogue. *J R Coll Physicians Lond*. 1996;30(5):410-412.
7. Tilburt JC, Curlin FA, Kaptchuk TJ, et al. Alternative medicine research in clinical practice: a US national survey. *Arch Intern Med*. 2009;169(7):670-677.
8. Coulter ID. Evidence based complementary and alternative medicine: promises and problems. *Forsch Komplementmed*. 2007;14(2):102-108.
9. Berman BM, Singh BK, Lao L, Singh BB, Ferentz KS, Hartnoll SM. Physicians' attitudes toward complementary or alternative medicine: a regional survey. *J Am Board Fam Pract*. 1995;8(5):361-366.
10. Gabbay J, le May A. Evidence based guidelines or collectively constructed “mind-lines?” Ethnographic study of knowledge management in primary care. *BMJ*. 2004; 329(7473):1013.
11. Institute of Medicine. Roundtable on evidence-based medicine. 2008. <http://www.iom.edu/CMS/AboutIOM/28189.aspx>. Accessed November 14, 2008.
12. American Academy of Family Physicians, American Academy of Pediatrics, American College of Physicians, American Osteopathic Association. Joint principles of the patient-centered medical home . 2007 <http://www.pccpc.net/node/14>. Accessed November 14, 2008.
13. Pincus T. Analyzing long-term outcomes of clinical care without randomized controlled clinical trials: the consecutive patient questionnaire database. *Advances: J Mind-Body Health*. 1997;13(2):3-31.
14. Cassel EJ. The nature of suffering and the goals of medicine. *N Engl J Med*. 1982; 306(11):639-645.
15. Feinstein AR. “Clinical Judgment” revisited: the distraction of quantitative models. *Ann Intern Med*. 1994;120(9):799-805.
16. Weston AD, Hood L. Systems biology, proteomics, and the future of health care: toward predictive, preventative, and personalized medicine. *J Proteome Res*. 2004; 3(2):179-196.
17. Jonas WB. The evidence house: how to build an inclusive base for complementary medicine. *West J Med*. 2001;175(2):79-80.
18. Jonas WB. Building an evidence house: challenges and solutions to research in complementary and alternative medicine. *Forsch Komplementarmed Klass Naturheilkd*. 2005;12(3):159-167.