

Medical Information, Judgment, and the Internet

Robert Wachbroit

The Internet has become an important and widely used source of information. Looking for information, particularly with a search engine, is so common that doing so with one of the most popular of search engines has now become a verb: “to google.” Most libraries either have access to the Internet or wish they had, in order to address their patrons’ information requests. And most traditional sources of information—e.g., newspapers—now have an online presence. Nevertheless, the Internet has been viewed as a problematic information source. A character in the recent movie, *The Manchurian Candidate*, refers to the Internet as the “sacred sanctuary of idiots and nutters,” which, as Hollywood movies often do, captures a common perception. And with that perception comes the problem of how we can identify reliable information on the Internet. As I show, the problem, when properly understood, has a general, commonsense solution, at least theoretically. Nevertheless, the specific case of medical information on the Internet points to a controversy within the medical profession that most outsiders are not aware of but nonetheless should be.

The General and Special Problem of Reliability

The problem of reliability has a general and a special form. In its general form, the problem is: How can we identify or determine the reliability of *any* information? That is to say, how can we be sure of some information without already assuming the reliability of some other piece of information? This is the well-known philosophical problem of skepticism. As every student of philosophy knows, a distinguished history and literature has developed surrounding efforts to answer or respond to this famously deep and difficult question.

The problem of reliability of information on the Internet is *not* this general problem. It is a special problem about the Internet as a source of information. In contrast to the general problem, we assume that some information, not on the Internet, is reliable and that we

can identify at least some instances of such reliability. The problem is how we can extend our recognition of reliability to cases in which the Internet is the source of information.

Notably, the problem of reliability is a problem about *justification* rather than a problem about *truth*. Of course we are interested in truth, but the only rational way to achieve that goal is to focus on justification. Our responsibility as seekers of truth is to believe only what we have justification to believe. While we expect our justified beliefs to be true, a *justified belief* is not the

The problem of the reliability of information on the Internet . . . is the problem of the justification for believing information on the Internet.

same thing as a *true belief*. Our beliefs are fallible—even with the best justification they can turn out to be false.

The fallibility of even our highly justified beliefs is hardly in dispute. The history of science is replete with examples. Discovering that some previously widely-held theory is false—Newtonian mechanics, for instance—does not entail that the people at that time were wrong or unjustified in believing Newtonian mechanics to be true. Such discoveries do, however, affect what we are now justified in believing. Unlike the people in the nineteenth century, we are not justified in believing in the truth of Newtonian mechanics.

The problem of the reliability of information on the Internet, therefore, is the problem of the justification for believing information on the Internet. If a source of information is indeed reliable, then we are justified in believing it—that is what it means to be “reliable.” Reliable sources can sometimes serve up falsehoods and unreliable sources can sometimes hit on the truth. But yielding falsehoods doesn’t necessarily undermine a source’s reliability as long as such errors are rare and

unsystematic. The question is how we can assess Internet sources of information.

Once we acknowledge that the problem concerns justification and not philosophical skepticism, the issues become more tractable. We can begin by considering how we ordinarily identify reliable information. In general, our procedures rest on an institutional division of labor. If someone wanted to know about the atmosphere of Mars, the date of an important historical event, or the chemical composition of milk, he would typically not engage in original or fundamental research. Instead, that person would turn to a source whose reliability is underwritten by a credible institution. He might consult, if appropriate, a newspaper with an established reputation or a report issued by a governmental agency or, most likely of all, an expert, who is so identified because she has the right credentials; that is, she has the appropriate certification by an academic or comparable institution. In general, our understanding of how our society acquires and stores knowledge amongst its various institutions enables us to know which institutions—or affiliated sources—we should turn to when we seek particular information.

While all this may be clear and straightforward on a general level, particular inquiries can face all sorts of problems. We might be able to identify a reliable source but have difficulty accessing it. Or the subject matter might be so obscure (to us) that we don't know whom to turn to for reliable information. Or there might be deliberate deception—for instance, someone poses as an expert and so is not a reliable source of information. Often, if we use cautious common sense and the help of appropriate professionals, such as librarians, we can address these concerns. They are surmountable, practical difficulties rather than theoretical problems.

A seemingly more serious problem arises when reliable sources disagree. This can happen for a variety of reasons. For example, on a particular topic an otherwise reliable source might be biased or worse. But the most common explanation is that the topic is controversial—reasonable people, including experts, disagree. This is how it should be when matters are unsettled. In such cases epistemic responsibility requires that we should either withhold belief or come down on one side or the other with appropriate qualifications and after suitable further inquiries.

What I have described in a rough and quick manner is our ordinary way of identifying reliable information and its critical use of credible institutions. The same approach seems entirely applicable when we consider information on the Internet, since many credible institutions have an online presence. Turning to such institutions is as reasonable online as it is offline; barring an occasional technical difficulty, one should be as reliable

as the other. And if we come across information from some other Internet source, its reliability, and so our warrant for believing it, should depend on whether it is in accord with antecedently identified reliable sources.

This last statement is somewhat at odds with some discussions of information reliability on the Internet which offer such tips as: check the date on the Web site, determine whether the authorship and contact information of the Web is displayed, and keep in mind that "if it sounds too good to be true then it probably isn't true." Such internal-checking advice is completely unnecessary once one checks the information against a reliable source. If we are not to assume that other reliable sources exist, then we are not really dealing with the problem of the reliability of information on the Internet but rather with the problem of philosophical skepticism. If there are no reliable sources on a particular topic, then we should be reasonably cautious in forming any judgment on the matter—but this points to no special conclusion about Internet sources. And if we are being asked to determine the reliability of information on the Internet without appealing to antecedently-identified reliable sources, then we need an explanation for this peculiar exclusion. It sounds much like trying to determine the reliability of a newspaper story without consulting anything outside that edition of the newspaper. What would be the point of framing the problem of reliability in that way? If we do not exclude the availability of antecedently-identified reliable sources, there is no special epistemological problem regarding information on the Internet. Saying that there is no special problem does not mean that it is always easy to identify reliable information on the Internet. The point is only that it is no more difficult online than offline.

It is important to keep in mind that the reliability of information depends upon the quality of the evidence underlying the information. As noted previously, most information seekers, whether on or off the Internet, lack the expertise to assess the quality of evidence. They must rely on experts and the appropriate institutions to identify whether some piece of information is reliable. Concerns or controversies over the quality of the evidence will usually manifest themselves in disagreements among experts over the reliability of some purported piece of information. If the experts disagree over whether the data support a particular statement, then our lay conclusions should be appropriately circumspect, tentative, and conditional.

All this, of course, depends upon the disagreement among experts achieving a certain level of publicity. This has not been the case in medicine where discussions regarding a controversy over the nature of medical evidence has for the most part not been publicly aired. Nevertheless, people who want to get medical information, whether or not from the Internet, need to

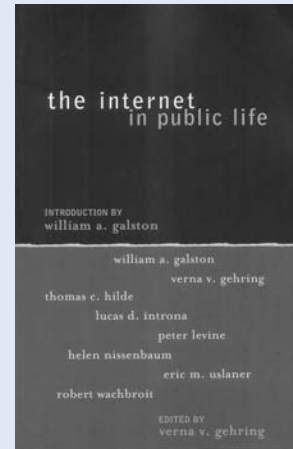
New Anthology

The Internet in Public Life

The spread of new information and communications technologies during the past two decades has helped reshape civic associations, political communities, and global relations. In the midst of the information revolution, we find that the speed of this technology-driven change has outpaced our understanding of its social and ethical effects. The moral dimensions of this new technology and its effects on social bonds need to be questioned and scrutinized: Should the Internet be understood as a new form of public space and a source of public good? What are we to make of hackers? Does the Internet strengthen or weaken community? In *The Internet in Public Life*, essayists confront these and other important questions. This timely and necessary volume makes clear the need for a broader conversation about the effects of the Internet, and the questions raised by these seven essays highlight some of the most pressing issues at hand.

Contributors:

William A. Galston; Verna V. Gehring; Thomas C. Hilde; Lucas D. Introna; Peter Levine; Eric M. Uslaner; Helen Nissenbaum; and Robert Wachbroit



136 pages
Cloth, \$60.00
Paper, \$16.95

For orders and information, please write or telephone the publisher:

Rowman & Littlefield Publishers, Inc.
4501 Forbes Boulevard, Suite 200
Lanham, Maryland 20706
(800) 462-6420
www.rowmanlittlefield.com

be aware of this controversy over "evidence-based medicine," the topic to which we now turn.

Understanding EBM

Most people who are not health professionals are stunned and a bit incredulous when told that evidence-based medicine is a recent movement in the field. They are likely to reply by saying something like, "How could this be a recent movement? What else could medicine be based on? How could it ever be considered otherwise?" Such replies indicate that the label—"evidence-based medicine"—is clearly tendentious. It is not that there are two sides: those who think medicine should be based on evidence and those who think it should rely on hunches, guesses, intuition, and luck. The controversy is not over what medicine should be based on but rather over what constitutes appropriate evidence in medicine. The evidence-based medicine (EBM) movement holds that certain kinds of evidence have primary or exclusive authority in medicine.

The problem with specifying what is considered proper evidence is that EBM is a moving target—the

definition of EBM has changed over the years. Early, strict views of EBM held that medicine should be based on scientific evidence—clinical trials or statistical analyses of past research. By contrast, clinical experience and the anecdotal case history should not count for much since, as evidence, they can easily be biased or incomplete. Later discussions define EBM as the "integration" of what used to be called EBM and clinical experience. But unless the word "integration" is explained, such definitions amount to little more than an attempt to define the controversy away—e.g., EBM is the *integration* of what used to be called EBM and its criticisms. Indeed, in a recent manual on EBM, some researchers acknowledge that the definition of EBM has become "more illusive, if not ambiguous." It is little wonder that the outsider can have such a puzzled reaction to the existence of a controversy over EBM even when one goes past the tendentious label.

We can get a better understanding of the matter by looking at how physicians are educated. Once someone gains the appropriate advanced degree in physics, mathematics, or engineering, she is considered competent and capable of engaging in work in physics, math-

ematics, or engineering. But having an advanced degree in medicine is not enough for engaging in medicine. After receiving their medical degrees, would-be physicians apprentice themselves to a senior physician or an institution (such as a hospital), in order to gain clinical experience and so develop clinical judgment, learning in a practical way what works and what does not. Thus, when a physician makes a judgment—typically about diagnosis or treatment—she will base her judgment on all that she knows, giving special weight to what she knows from experience. For example, two different ways of treating a particular disease might be available. If the physician's experience has been more with one of these treatments, she will understandably go with what, in her experience, works.

The thought underlying EBM is that this is too idiosyncratic a basis for medical judgments. The best evidence is comprehensive, systematic, and scientific. The various procedures, recommendations, diagnoses, etc., should be subject to scientific analysis—a randomized clinical trial, if possible—to determine which medical practices have the better outcome. It may well be that a particular physician has had a good track record with procedure A, but the efficacy of that procedure should be confirmed by a large-scale scientific test. A scientific analysis might reveal that a different procedure B yields statistically better outcomes. That is to say, according to EBM, the justification for a physician's judgment should not be: "This is based on my medical knowledge but primarily on my experience of what works." Instead, the justification should be something like: "This is based on certain scientific investigations (e.g., randomized clinical trials) or on statistical analysis of various studies."

The case for EBM is clear. Medicine is based on the science of biology. Generalizations grounded in scientific evidence are far more credible than generalizations grounded in anecdotes from experience. One good example is the determination of the efficacy of medications. Regardless the number of success stories that a physician can summon from his experience, such success stories are a poor basis for generalization when compared to what a randomized clinical trial

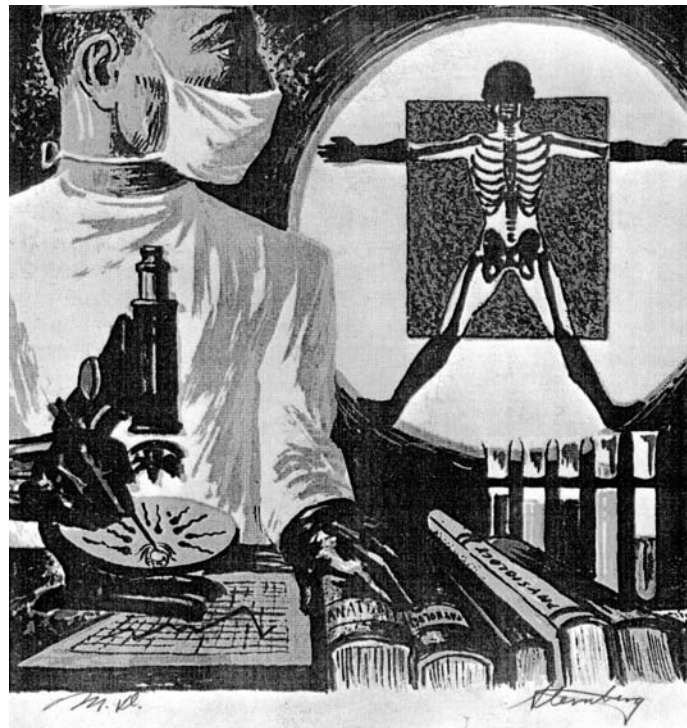
would provide. Success stories can be full of selection bias and other confounding variables, undetected, and perhaps undetectable, from the data comprising a clinician's experience. A scientific study gives us much better insight into identifying and accounting for such variables, so that we can say with justification whether a particular medication is in general efficacious and by how much.

The case against EBM begins with the claim that the goal of medicine—maintaining and promoting the health of patients—involves judgments about specific individuals. While conceding that generalizations based on systematic scientific evidence are far more credible than those based on anecdotal case studies,

the critic of EBM points out that the application of these credible generalizations to individual patients is not at all straightforward. Generalizations in medicine are typically statistical. For example, one might say that most people, or the average person, will benefit more from treatment A than from treatment B. The statistical character of these generalizations reflects the variability in human beings. We differ in how we heal, how we respond to treatments, how we are vulnerable, and how and which symptoms we manifest when we have a particular disease. Hence, knowing that 80 per cent of most people respond to treatment

A does not entail that the individual patient in front of the physician will respond if so treated; the patient might be part of the 20 percent that should be given treatment B. That is to say, a statistical generalization is about a population or a group of people, it is not about an individual. In order to bring that statistical generalization to bear on a specific patient the physician needs to exercise clinical judgment, of course informed by the statistical generalization, but forged through clinical experience. Based on his particular experience, the physician might judge that this patient is an exception to the accepted generalization.

In other words, the critic of EBM notes that the practice of medicine requires applying a statistical generalization to an individual patient. In order to bridge that gap, the physician needs to appeal to something beyond the evidence codified by EBM. That something



is clinical experience. The advocate of EBM, in the strict sense that we have been characterizing it, denies that there is any “inferential gap” between the statistical generalization and the case of an individual patient. Although the statistical generalization does not entail that this particular patient will respond to treatment A, the physician should nonetheless recommend treatment A, given the available evidence. He has no justification—only what the advocate of EBM dismisses as hunches and intuition—to recommend otherwise.

The critic of EBM will object to this characterization. Clinical experience does not refer simply to a compilation or database of clinical cases. If it did, then it would refer to nothing more than a collection of anecdotes, which, as the advocate of EBM stresses, can easily be incorporated into the statistical generalizations underlying EBM. Clinical experience refers to the clinical judgment and perception that are developed and shaped by the medical cases that the physician encounters. Thus, two competent physicians with different clinical experiences may see and judge the same cases differently.

This last point can vividly illustrate a significant difference over EBM—the justification for seeking second opinions. In mathematics, physics, and the other sciences, seeking second opinions has little rationale. If a mathematician presents a solution to a given problem, the only reason for seeking the opinion of a second mathematician is if one doubts the first mathematician’s solution. If the two mathematicians disagree, at least one of them has made a mistake. Consequently, one doesn’t really seek second opinions in these cases so much as one seeks confirmation of the first opinion. The matter is quite different in the case of medicine, which has traditionally encouraged patients to seek second opinions, especially in cases of life-threatening or unusual diseases. The rationale for seeking second opinions is not that there is doubt about the judgment of the first physician. Seeking a second opinion is not a criticism of the first physician’s competence. It is an acknowledgement of the importance of individual clinical experience in forming a physician’s judgment and perception. For example:

The controversy over EBM is a dispute over what constitutes medical evidence and therefore is a dispute over how to form reliable medical judgments about individual patients.

Physician X examines a patient, noting that he exhibits most but not all of the symptoms associated with a serious disease, and diagnoses accordingly. A second physician Y is brought in—at the patient’s request, physician X’s request, or both—who notes the same symptoms but, based on his experience, is

more concerned *in this specific case* about the absence of certain symptoms than physician X is. The two physicians discuss the matter and agree to run some further tests to resolve the issue.

In this example, neither the care nor competence of physician X is being questioned. The purpose of seeking a second opinion is to broaden the experiential base for clinical judgments.

From the standpoint of EBM, at least understood strictly, seeking second opinions does not have this rationale. The evidence for medical judgments can consist only of the results of clinical trials and the statistical analyses of past research. The result of EBM should therefore be a standardization of medical judgments, much as physics or mathematics is standardized. How could two competent physicians disagree about a particular case when they agree on the scientific evidence and agree that that evidence is the best or primary evidence for medical judgments? The idiosyncratic differences in the experiences of physician X and Y are just that. It would seem that according to EBM there is no point in seeking a second opinion unless one has doubts about the first physician’s competence or knowledge of the latest research.

The controversy over EBM is a dispute over what constitutes medical evidence and therefore is a dispute over how to form reliable medical judgments about individual patients. Is scientific evidence enough or is clinical experience essential? It is not the purpose of this paper to resolve this dispute. Our purpose has been to show the existence and importance of this controversy within the medical profession. Outside the profession, this controversy has implications for the lay person’s interest in medical information on the Internet, to which we now return.

Reliable Information, Reliable Judgments

People seeking medical information on the Internet can be highly motivated, since their search for medical information is often driven by a desire to understand or form a medical judgment about themselves or about someone for whom they care. The purposes of such inquiries can usually be classified into three types:

(1) The inquiries can be an attempt to supplement or provide a fuller background to the information and judgments given by a physician.

(2) The inquiries can be an attempt to seek a second (medical) opinion.

(3) The inquiries can be an attempt to form an alternative to seeing any physician.

This classification thus represents three common kinds of uses of medical information by a non-expert.

The first type represents an important development in the physician-patient relationship and in the general trend to place more authority and control over decision-making in patients. Although a physician is

expected to answer fully his patient's questions about diagnosis, treatment, and any other medical assessments or judgments, the patient might realize later, after he has left the physician, that he needs more information or more explanation. The Internet can function as a useful alternative and supplemental source for such information and explanations. Indeed, a patient (or caregiver) might find information on the Internet easier to assimilate than information presented in the formal setting of a physician's office. In addition, and at least as important, the patient might not know all the questions that are worth asking. Even though the physician has tried to explain his assessment of the patient's medical condition, ending with the inviting, "Do you have any questions?" the patient might still be unsatisfied but not know what more to ask. The Internet can make patients and their caregivers more sophisticated, learning more about the

A patient (or caregiver) might find information on the Internet easier to assimilate than information presented in the formal setting of a physician's office.

medical condition and concerns others have raised, and so help articulate the patient's and caregiver's own concerns and questions, which can then be addressed in their subsequent visits to the physician.

The second and third types of inquiries are much more problematic. Can the Internet user—whom we assume is not a health professional and has no clinical experience—and who obtains medical information (statistical or about other people) on the Internet, form reliable medical judgments about an individual? This is where the dispute over EBM is relevant. If we assume that clinical experience is not essential to forming reliable medical judgments—no more essential than experience as a mathematician or as a physicist is essential to forming reliable judgments in mathematics or physics—then it is possible for a sufficiently smart and informed Internet user to form reliable medical judgments. Such an assumption is controversial, as we have seen.

Consider, therefore, the second use identified above—using the Internet to form second opinions. As was noted, the rationale for seeking second opinions in medicine rests on a view of how clinical experience shapes medical judgments and perceptions. If we drop the significance of clinical experience from the picture, we drop the rationale for seeking second opinions as well. Thus, a lay person cannot get a second medical opinion regarding a specific diagnosis or treatment plan simply by gathering information from

the Internet. The individual can of course gather information in an effort to confirm or challenge a physician's judgment, but only in limited ways. One can use the Internet to gather reliable medical information in order to check on whether the scientific evidence underlying the physician's judgment is the most current. If there are discrepancies, they should be discussed with the physician. If the discussions are not satisfactory, the physician should be replaced. But all this is not augmenting the first physician's judgment with a second medical opinion; it is checking the competence of the first physician.

The third use—using the Internet as an alternative to seeing any physician—can arise for several reasons. One reason might be that one simply does not trust physicians, claiming that their judgments are biased toward their financial interests and the protection of their profession. It is not clear how one can consistently not trust physicians but trust the medical information on the Internet, which is often written by physicians. Another reason might be that one does trust physicians but nevertheless uses the Internet to determine whether on a particular occasion it is worth seeing a physician. But this reason is based on a mistaken view of when it is worth seeing a physician—i.e., only when the medical condition is serious and worth the physician's time. It is worth seeing a physician when it is worth the patient's time—i.e., when the patient (or appropriate other, such as a caregiver) is concerned about signs, symptoms, or other aspects of a medical condition. Yet another reason might be that one trusts physicians and wants to see one but goes online instead because it is the only option: no physician is available. This unavailability can arise because of manpower shortages, economic barriers, or other problems with access to the health care system. In such cases, the Internet user would see, probably rightly, that going online is a poor alternative to seeing a physician. The question is whether this is better than nothing at all; in some cases it might be, but it is not always clear when it is. The Internet is no substitute for adequate access to health care.

Finally, one might believe that, armed with the appropriate textbooks and the reliable medical information that can be found on the Internet, one could form reliable medical judgments about a particular individual. That is, one might hold to the strict EBM line but without realizing it since, as I have noted, few outside medicine are even aware of much less hold to the EBM view, and even advocates of EBM in the medical professional do not adopt the strict EBM line. Quite likely, therefore, those tempted to use the Internet in this way might well be less tempted once they are aware of the controversy over strict EBM. Accordingly, medical organizations, at the very least, should see it as their responsibility to make awareness

of the EBM controversy more widespread.

Although there has been some concern over the reliability of medical information on the Internet, the significance of that concern depends upon how the information will be used. Some uses, such as acquiring a general understanding of a medical condition, are unexceptional. Others, such as forming a medical judgment about an individual, are more problematic. There is no straight line from reliable information to reliable judgments.

Robert Wachbroit
Institute for Philosophy and Public Policy
School of Public Policy
University of Maryland
rswa@umd.edu

This article was supported by a grant from the Netherlands Organization for Scientific Research (NWO: Nederlandse Organisatie voor Wetenschappelijk Onderzoek), awarded to Tilburg University, on the topic of medical information on the Internet.

Sources: On "googling" see E. Dickson *et al.*, 2004, "Dawn Of A New Word Order," *The Independent* (London), November 4. The perception of the Internet as a "sacred sanctuary of idiots . . ." may be changing; see, for example, V. Klinkenborg (2004), "Behind the Rise of Google Lies the Rise in Internet Credibility," *The New York Times*, A26, February, 27. The institutional characterization of expert is rejected by Kenneth W. Goodman as circular. He prefers to define an expert as someone "who just knows a lot" and then struggles to specify what "a lot" means. *Ethics and Evidence-Based Medicine* (Cambridge, Cambridge Univ. Press, 2003). But this neglects the fact that an expert is not only an authority but also has authority of a certain kind—i.e., an expert is not only a source of information in a domain but is also a judge on the acceptability of new discoveries to that domain. Such authority, I maintain, derives from appropriate institutions. The apparent circularity of an institutional definition of "expert" is a result of experts and academic institutions having to be in a reflective equilibrium. For more on this understanding of expertise, see my "The Changing Role of Expertise in Public Deliberation," in *Civil Society, Democracy, and Civic Renewal*, edited by Robert K. Fullinwider, (Lanham, Md: Rowman and Littlefield, 1999). On the point that "if it sounds too good to be true, it probably isn't," see, for example, [http://www.ihealthcoalition.org/](http://www.ihealthcoalition.org/content/tips.html)

<http://www.who.int/medicines/library/qsm/who-edm-qsm-99-4/medicines-on-internet-guide.html> as well as books such as J. Alexander and M. Tate, *Web Wisdom: How to Evaluate and Create Information Quality on the Web* (Mahwah, N.J., Erlbaum Associates, 1999). I should acknowledge that their advice does extend beyond this internal-checking advice to more useful tips. For further discussion on reliability and the Internet, see A. Vedder and R. Wachbroit "Reliability of Information on the Internet: Some Distinctions," *Ethics and Information Technology*, vol. 5 (2003). On the point that clinical experience and the anecdotal case history should not count for much since, as evidence, they can easily be biased or incomplete, see: Evidence-Based Medicine Working Group, "Evidence-Based Medicine: A New Approach to Teaching the Practice of Medicine," *Journal of the American Medical Association*, vol. 268 (1992). On the "integration" of what used to be called EBM and clinical experience, etc. see D. Sackett, et al., "Evidence Based Medicine: What It Is and What It Isn't," *British Journal of Medicine*, vol. 312 (1996) and also A. Roberts and K. Yeager, "Systematic Reviews of Evidence-Based Studies and Practice-Based Research: How to Search For, Develop, and Use Them," in *Evidence-Based Practice Manual*, edited by A. Roberts and K. Yeager (Oxford, Oxford Univ. Press, 2004). On the definition of EBM as having become "more illusive, if not ambiguous," see: K. Corcoran and V. Vandiver, "Implementing Best Practice and Expert Consensus Procedures," in *Evidence-Based Practice Manual*, edited by A. Roberts and K. Yeager (Oxford, Oxford Univ. Press, 2004). On the point that the physician needs to appeal to something beyond the evidence codified by EBM, that something being clinical experience, see M. Tonelli, "The Limits of Evidence-Based Medicine," *Respiratory Care*, vol. 46 (2001). On seeking second opinions, see J. Groopman, *Second Opinions: Stories of Intuition and Choice in the Changing World of Medicine* (New York, Viking Press, 2000).

