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Upcoming Issues of *Virtual Mentor*

January: Special Theme Issue on Internal Medicine

February: Quality of Life and Clinical Decision Making

March: Ethics in Adolescent Medicine

From the Editor

Ethics in Standards of Care: The Joy of Doctoring

The theme editor introduces a special issue examining ethical considerations in standards of care in medicine.

More than 2 years ago, my closest friend gave me a copy of *The Joy of Cooking* [1], commemorating our friendship and many wonderful home cooked meals together. Excitedly, I cracked it open and was awestruck by the incredible detail and sheer amount of information. My scientific side appreciated the chemical explanations of why food cooks. Who knew that "double-acting" baking powder is so called because of a simple 2-phase acid-base reaction, one of which is temperature sensitive? And pick your potato wisely—the amount of starch and moisture present reveals whether it is likely to be a "boiler" or a "baker." How could any future dinner party go wrong? Might professional chefs be nervous, their art reduced to a 1136-page book?

I quickly began attempts to follow the recipes *exactly*: 45 minutes in the oven? Set the stopwatch—accurate to a tenth of a second, of course. To my dismay, perfection was elusive. On some occasions, I simply did not have the required ingredients (Mace? I thought that was a self-defense spray). On others, I was unable to execute the actions required by the recipes (carving a turkey, for example, seems to require cooperation on the part of the turkey, not mentioned in the recipe). It became clear that professional chefs had little reason to be nervous.

This analogy perhaps parallels some of the frustration many health care professionals have with "cookbook care." Cookbook care is a phrase often used to describe the mechanistic application of clinical practice guidelines (CPGs) or one of its close relatives, evidence-based medicine (EBM). Though distinct concepts, both fall under the general rubric of "medical standards of care." The frustration takes at least 2 forms: first, frustration that EBM and CPGs take away the "art of medicine," reducing health care professionals to automated decision makers (like the professional chefs' worry, above); and second, frustration that, in some cases, the evidence and guidelines simply do not apply to his or her particular situation (my worry about the mace).

If the stakes in health care were only as high as that of a collapsed soufflé, this might not be a problem. But we all know that errors in health care are costly, both for the patients harmed and the system as a whole. Prior issues of this journal have discussed the related topics of medical error and patient safety (see *Virtual Mentor*, [March 2004](#) and [June 2004](#)). To call something a medical error, however, presupposes a standard against which to judge an act or decision; in turn, these standards require an evidentiary base. The December 2004 *Virtual Mentor*, therefore, examines some foundational questions surrounding the evidentiary base of medical standards of care and their application.

The increased availability of both EBM and CPGs tempts one to think in black-and-white terms: "All medical decisions are either consistent with the best evidence, or they are not; and when they are not, they are flawed." This statement implicitly supports "cookbook care" by suggesting that one course of action is the absolute best in every situation. In doing so, it wrongfully assumes that evidence is of uniform quality, availability, and, most of all, certainty. Medicine involves decision under uncertainty, however, and uncertainty comes in degrees.

Uncertainty is inseparable from the very processes of evidence gathering and standard setting, for they involve *development, dissemination, application, and enforcement*. All 4 processes involve uncertainty because all require, at some level, good judgment (scientific or otherwise). Although admittedly oversimplified—as stated, the 4 processes might seem to occur separately in time and ignore the obvious need for revision—this characterization of standard setting helps frame a range of potential questions: Who is an appropriate authority for developing standards? What

counts as a "good" evidentiary base? On what evidence is the standard based, and to what end is it directed (eg, a particular patient or society more generally)? How should such standards be disseminated, and what is the responsibility of individual health care professionals to seek their guidance? Should the enforcement of standards be accomplished via legal measures, by means internal to the profession, or both? How is the standard of care constrained or affected by social norms? This month's contributors address some of these questions, and more. They convincingly demonstrate that evidence-based medicine, clinical practice guidelines, and the concept of a standard of care are ethical issues, not merely scientific ones: normative judgments are employed throughout all stages of evidence gathering and in its eventual application.

We are interested in how our contributors answer these process-oriented questions because we are interested in the answer to a more general one: when does ignorance of the "best available evidence," or even its outright rejection, become morally blameworthy? As our authors point out, the relationship between so-called "cookbook care" and the "art of medicine" is neither a simple one nor one of mutual exclusion. The *Joy of Doctoring* can be found not somewhere in between, but rather through the synergistic use of appropriate guidelines, other decision making tools, and of course, patient values.

Matt DeCamp

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A Fever of Unknown Source

Physicians should use evidence-based guidelines as a starting point to make sound clinical treatment decisions for a patient's individual medical needs.

Commentary by Francis Neelon, MD, Robert H. Pantell, MD, and Timothy E. Quill, MD

Mr. and Mrs. Kendall were quite excited about the newest addition to their family, 2-month-old Janna. But they were anxious on this trip to the doctor. Janna had developed a fever in the middle of the night, and the Kendalls decided to take her to the emergency room. Dr. Stinton, the ER physician on service, heard of the Kendalls' story and decided she'd better see their daughter straight away.

Upon questioning, Dr. Stinton learned that Mrs. Kendall's pregnancy with Janna was perfectly normal, as was her delivery at just over 38 weeks. In fact, until last night, the Kendalls had little reason to be concerned about Janna's health. As they reported, she'd passed all her doctor's visits with flying colors and had begun immunizations according to schedule. In other words, she was overall a healthy infant.

Last night, however, they awoke to cries unlike those they had heard before and ran in to check on Janna. She had no interest in being fed and seemed warm to her mother. She had been irritable throughout the day and less interested in nursing. Mrs. Kendall took Janna's temperature twice rectally, and both times it read 38.3° C. That's when they bundled her up and went to the ER.

On physical exam, Janna was alert and active in her mother's arms, but appeared ill. Her temperature registered 38.4° C. The physical was normal, revealing no obvious foci of infection. A complete blood count in the ER uncovered a slightly elevated white blood cell count (15.5 x 10⁹ cells / Liter) but no other abnormalities. On the basis of these findings, Janna was admitted to the hospital for fever of unknown source; her workup included urinalysis, urine culture, chest radiography, blood cultures, and lumbar puncture. In lieu of lab results, antibiotics were started.

Distressed by the invasiveness of the tests (which lasted well into the early morning hours) and the hospital admission, the Kendalls asked for more information about the likelihood of a serious illness. Dr. Stinton responded that it was hard to say. "The information is quite complex, and we don't want to confuse you. Let's not take any chances." Willing to do whatever it took for Janna to be well, they agreed.

After Janna reached the hospital ward, Mr. Alstadt, a medical student on his clinical clerkship began learning Janna's story through the family's account and ER notes. He diligently prepared for presenting his new patient on rounds later that day.

When the attending asked Mr. Alstadt the reason for Janna's admission, Mr. Alstadt recalled the story and was poised with several sets of clinical guidelines and algorithms from various sources that he had researched overnight [1,2]. He quoted beautifully from them, and most of them seemed to support admitting Janna for a full sepsis workup.

The attending physician was not convinced. "Really? Who recommends a full sepsis workup for a moderately ill, 2-month-old infant likely to have reliable follow-up with her parents? In my clinical judgment, this patient should have been sent home last night, maybe after taking a blood culture, but definitely without a lumbar puncture. I think medical

school should spend less time teaching you those guidelines and give you more time to really see patients. That's where you learn to practice medicine. Well, she's here now. Let's go see her."

The team walked to Janna's room, where they found an infant whose temperature was now 37.3° C, sleeping pleasantly. Her parents appeared tired, but relieved.

The attending physician glanced at Mr. Alstadt and smiled.

Suggested Readings

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Commentary 1

by Francis A. Neelon, MD

The case vignette sets the values surrounding evidence-based medicine and the art of medicine in stark contrast to one another, as though educators and students must choose one or the other. I think this false dichotomy might be avoided if we used terms like "evidence-based treatment" or "evidence-based evaluation" instead of "evidence-based medicine," which implies that "evidence" is the be-all and end-all of medical practice rather than a small, albeit important, part. It would also help if we emphasized that what one does with evidence-based information is to apply it with judgment. This is never simple; 2500 years ago, Hippocrates already knew that "experience is fallacious and judgment difficult" [1]. Real science is our only defense against the fallacy of experience, and an open mind and careful attention to the patient, our only hope for achieving good judgment.

The evidence-based protocols now available derive from statistical analysis of large numbers of patients, assembled according to a specific diagnosis and treated in a standardized way. Such analyses rely on the fact that, in at least some ways (for example, in their shared diagnostic label), those people are similar to one another. They share similarities, but they are not identical. Judgment, on the other hand, represents the application of evidence-based guidelines to this individual person or that individual person (my patient). Judgment attempts to deal with and respond to the ways in which even people with the same diagnosis differ from one another. While I steadfastly support the value of properly conducted science in uncovering what is the best thing to do, in general, I am always fearful that any given patient may be part of the fraction of study subjects who did less well than the majority under the evidence-based protocol. So I try to decide whether the characteristics of my patient make it likely that he or she will respond like the study majority, and—even if I decide "yes"—I need to be constantly vigilant for any clues that we should change course, no matter what the evidence-based guidelines say. I am always mindful of the fact that statistics are "what happened to 100 other people"; no matter how good evidence-based treatment may be in the aggregate, it may be very bad in *this* individual. So the commitment of the doctor must be not just to prescribe what is best, but also to stay in contact with (and that means to be *personally* available to) the patient, to be sure that the chosen path was in fact a good one.

Five Percent Science; 95 Percent Judgment?

I agree that scientific data must inform our decisions. But such decisions account for maybe 5 percent of my daily work. The other 95 percent (and some days it is more) is devoted to convincing patients to actually *do* or continue to do what seems clearly to be the best thing. That is what I would call the Art of Medicine, and it is what consumes most of my time and energy. Let me give you an example. Every day I see patients with obesity and type 2 diabetes. I know that both conditions can (usually) be "cured" by weight loss and exercise. I tell patients but they rarely do either, so I offer them pills and, when these fail, insulin. The questions I ask myself are: do I collude with those patients by agreeing to prescribe medications while they refuse, in word or deed, to do the more important things (lose weight and exercise)? How do I get them to change their lives rather than swallow chemicals, especially when I "know" which is truly best? Should I say "No" as long as they are unwilling to say "Yes" to their part of the bargain? How often do I

really try, no matter how recalcitrant the patient, rather than pulling out the prescription pad to truncate the visit and reap the monetary rewards of increased clinical throughput? Evidence-based evaluation and treatment is just the beginning of clinical work.

I would say this about the vignette itself: I think that much more was going on in the scenario than meets the eye. Why was the unnamed attending physician so unhappy with the decisions that were made? The baby was better; Mr. Alstadt learned a lot; the parents were relieved; the hospital made some money. Is the attending physician a "clinical arrogant," unable or unwilling to learn by watching young people do good things that do not spring directly from his own lips? Many years ago, Eugene Stead reminded us that the "most effective teachers create a shadowy framework on which the student can climb" [2], and Morton Bogdonoff once said within my hearing that a teaching hospital is a teaching hospital "because patients teach students who teach interns who teach residents who teach attending physicians." Clinical instructors need to remember those things. On the other hand, was Mr. Alstadt a bit overconfident, presenting his conclusions with such preening arrogance that the attending physician felt compelled to stake out his own territory? All teachers feel that way at some time, and no one profits from it. So the teaching/learning atmosphere could have been much enhanced, if only both participants could achieve a sense of collegial inquiry into whatever evidence-based recommendations are available, and the exercise of good judgment on behalf of the patient.

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Commentary 2

by Robert H. Pantell, MD

The optimal management of fever in young infants has been a hot topic in pediatrics for over 30 years. Physicians have always used clinical judgment in deciding on the best strategy to deal with a patient's problem. Infants, however, cannot tell their own stories, and clinical signs and physical findings are often less reliable than in older babies and children. Furthermore, serious infections may develop and progress more rapidly in young infants. In the 1970s a re-emergence of group B beta streptococcal disease in newborns, as well as late onset group B streptococcal infections in early infancy with accompanying reports of considerable morbidity and mortality, concerned physicians. Reports emerged that clinical judgment was often inaccurate in identifying whether febrile infants had a minor respiratory infection or sepsis [1]. Consequently many academic medical centers developed policies to perform a complete sepsis work-up on all febrile infants. Some institutions limited this policy to infants less than a month old while others included infants as old as 3 months. In addition to obtaining blood for CBC and culture, clinicians were required to obtain urine by catheterization for analysis and culture. Lumbar punctures were required to analyze and culture cerebrospinal fluid. All infants were then placed on appropriate intravenous antibiotics and hospitalized for 2 to 3 days until culture results were known.

These policies were designed to minimize the likelihood that an untreated occult infection in a febrile infant would progress and harm the child. Unfortunately the procedures, antibiotics, and hospital experiences also carry their own potential for harm. The iatrogenic consequences of this policy of hospitalizing febrile infants were highlighted in a 1983 report [2]. Furthermore, all antibiotics have adverse consequences; lumbar punctures have a very small but

documented morbidity and mortality, and hospitals are sources of nosocomial infections and medication errors. Finally, the psychological and financial costs of hospitalizing young infants are considerable.

Despite many published reports advocating for such policies, implementation was far from universal, particularly by practicing pediatricians. Most recommendations came from institutions caring for large populations of poor children living in the inner city and utilizing emergency rooms. Pediatricians wondered how relevant these studies were to their individual populations of patients. Also, one study suggested that if these guidelines were strictly followed, between 5 percent and 10 percent of infants less than 3 months old seen in a community practice would be hospitalized [3].

In the late 1990s, the Pediatric Research in Office Settings (PROS) network of the American Academy of Pediatrics sought to clarify the optimal strategy for managing febrile infants. This nationwide network of more than 1000 clinicians was able to study a broad cross-section of infants with a diverse geographic, economic, and ethnic mix. In PROS' Febrile Infant Study, 573 clinicians recorded their usual practice in caring for 3006 episodes of fever in infants less than 3 months old along with clinical outcomes [4].

This study differed from most previous studies by having infants from community practices. Unlike many patients seen in emergency rooms, these infants/families are often well known by their clinicians. In primary care practice it is also customary to follow such patients closely. In this study most infants had an additional visit and phone follow up. Only about 40 percent of the clinicians followed the published policies. (Note: Although there are common references to fever "guidelines," and many respected clinicians and researchers have published their versions of optimal care, no professional society or governmental group has issued "guidelines" on the management of febrile infants). The PROS study documented 54 cases of bacteremia and 14 cases of bacterial meningitis (5 were simultaneously bacteremic) out of the more than 3000 fever episodes. These were considered the most serious illnesses, ie, those for which a delay in diagnosis and treatment could have serious consequences for infants. Of the 63 infants with these diagnoses, 61 were treated with appropriate antibiotics at the initial visit. The other 2 infants were identified in a timely fashion and treated and had no sequelae. Of interest, had the "guidelines" been followed, 3 cases would have experienced delays in treatment (no statistical difference) but there would have been substantially more infants tested, treated, and hospitalized [4].

What does this all mean and how is it relevant to this case? First, it is important to realize that the PROS clinicians were experienced, with a median age of 45. In other words, to allow a suitable place for clinician judgment may require truly *experienced* clinical judgment. When clinical judgment becomes *experienced* judgment is a difficult question, but this model is clearly not for interns in July, unless they have consulted with an attending physician.

Who decides?

The second point is to question who actually makes the decision. In this hypothetical case the Kendalls were told that the information was complex and the residents didn't want to confuse them. In fact, almost all parents have to deal with complex information and decisions in their personal and professional lives, and few are as critical as those pertaining to the health of their children. You have their undivided attention! And the information can be presented in a meaningful way to help the parents participate in active decision making. In some situations clinicians should be fairly directive: "Jason looks very ill to us; he is only 2 weeks old and is minimally responsive. We are concerned enough that we plan to do a number of tests, including a spinal tap for which we will need your permission, after which we will start antibiotics and plan to observe him in the hospital until we are certain of the best course." The PROS Febrile Infant Study provides valuable information on the risks of serious disease given various clinical findings. Most of the findings of the PROS study are consistent with the intent of the guidelines, placing the sickest-appearing, youngest, and most febrile infants at highest risk. One of the values of this large study is that it allows clinicians to estimate the absolute risk of various scenarios in addition to the relative risks associated with clinical features. Therefore, another scenario could sound like this: "Even though Suzy is only 5 weeks old, she is very interactive and appears only minimally ill. With a temperature of 38.3 C, we estimate that her risk of serious illness is less than half a percent. While we could go ahead and do some blood tests if you are concerned, we have an option of following her closely by seeing her again in the morning, or sooner if you like. I would like to examine her urine today. If that is okay, you could take her home. Do you have our phone number if you need to call?" This gives the parent the option of asking questions, as well as considering whether they are risk-averse and wish more laboratory

testing given the probabilities presented.

While guidelines certainly have a role in clinical medicine, they should never be viewed as commandments. In some settings—such as busy emergency rooms serving patients with whom patient follow-up is challenging—better adherence to guidelines may be appropriate. Community practitioners caring for patients who can be followed closely can exercise individualized clinical judgment along with information generated from the PROS study and knowledge about the individual family to provide optimal care. The bottom line for this debate was captured by a clinician after poring over much of the data, including risks and odds ratios, from the PROS study (Maureen Shannon, personal communication): "If you want commandments or God, go to church; if you want odds, go to Vegas; if you want good clinical care, go to a good clinician."

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Commentary 3

by Timothy Quill, MD

Not being a pediatrician, I may be demonstrating a certain hubris discussing clinical reasoning around a febrile infant where the possibility of meningitis has been raised. I remember certain "rules of thumb" from my training: if you simply *thought* of doing a lumbar puncture (LP) as part of a fever work-up, you must proceed. The implicit message was that meningitis was so dangerous that any possibility, no matter how small, warranted the procedure. Our only choice when we felt an LP was clearly not indicated was to not think of the possibility, or at least not talk about it. Clearly there must be a better way.

The development of algorithms or guidelines has been part of an effort to use best available evidence to counteract some of the irrationalities and irregularities that result when one relies totally on the clinical judgment and inherent biases of individual physicians. These more sophisticated "rules of thumb" usually rely on characteristics of population-based studies as well as on expert opinion to guide physicians to make rational choices more on the basis of available clinical evidence than on individual clinical experience. In many instances, such guidelines have improved the quality of care in areas where the evidence is clear (for example, the use of ACE inhibitors in heart failure [1] and not using antibiotics for uncomplicated sinusitis [2]) and where practice variation has been wide and irrational.

Algorithms and guidelines are well suited to common dilemmas such as the febrile infant [3], where there may be a low probability of a dreaded disease like bacterial meningitis, where there may be clinical markers that increase or decrease the probabilities, and where the consequences of delay in diagnosis and treatment can be lethal. Thus, when one thinks of meningitis in the differential diagnosis of a febrile infant, one must think in terms of thresholds (probability of meningitis). Since the consequences of missing the diagnosis of bacterial meningitis are so profound,

the threshold for treatment must be relatively low. But the threshold cannot be so low that we return to the level of "if you think of meningitis, you must do a lumbar puncture," or so high that we put some infants unnecessarily at risk for the consequences of untreated infection because we're reluctant to intervene. If we say the probability of meningitis in this infant was about 5 percent, then we would do 19 unnecessary LPs for every case of meningitis. Importantly, although the case may appeal to our sentiments with its happy ending, this misses the point. The fact that this baby looks fine the next day does not tell us anything about the appropriateness of the LP and antibiotics in the first place.

Guidelines have been very helpful in standardizing best practices, but they cannot be applied rigidly and unthinkingly. They define standards of care in highly restricted circumstances and force clinicians to justify why they recommend variation, if they choose to do so. Of course, one can also "unbundle" a guideline (ie, by following 1 part of the guideline but choosing not to follow another) in this case by performing an LP without empirically starting antibiotics if the pretest probability is low and the initial cell counts appear negative. Conversely, if the child looked sicker or had an exposure to a known case of meningitis, such that the pretest probability approached 50 percent, empirically starting antibiotics while doing the LP might have been the best course. Thus, the existence of a guideline or algorithm does not preclude the need to exercise clinical judgment. Part of that judgment requires that probabilities of alternate outcomes be estimated based on existing studies in light of clinical experience, and then the reasons for particular actions are clearly explained.

Communicate Evidence to Parents

The area where the physicians in this vignette were most inadequate was not in the decision to do an LP and start empirical antibiotics but in their inability or unwillingness to make every effort to make their thinking transparent to the parents first, and to the medical student second. With all the work that has been done promoting evidence-based decision making, there has been a minimal amount of empirical work discovering how best to communicate about this evidence; this is necessary for making the best possible decisions with patients and families [4]. In this low-probability situation, the parents might have been told about the odds of bacterial meningitis using either lay terms ("small chance") or numbers ("5 percent chance"), and then told that the physicians' recommendation is that empirical treatment be started even though the odds are much higher (95 percent) that there is no such infection.

Most parents would accept such recommendations, but some might want to have further input in this situation based on their values and personal experiences. For example, if one of the parents had had a serious allergic reaction to antibiotics, or held a belief system that precluded the use of Western medicine, he or she might ask some hard questions about risks and benefits of empirical treatment. Physician and family would agree that they all had the infant's best interests in mind, and they would then seek common ground around the best possible treatment rather than entering into a power struggle [5]. Physicians should not shy away from making recommendations when the evidence about the best approach is clear from a medical point of view [6], but they must also learn to explain their recommendations in easily understandable terms. They must listen carefully to, and learn from, patients and families to be sure both parties understand one another. When a child is involved, additional ethical obligations of representing a patient with no actual voice in the discussion are added to the mix. The communication skills needed to conduct this part of an interview are not well taught in medical school, and most clinicians have not been observed or evaluated on their skill level. Therefore, practice variation is probably quite large, further adding to the gap between best evidence and best practice.

In a similar vein, the medical student should not get the message that guidelines in general are useless, just that they need to be interpreted in light of clinical judgment. The attending might ask the students about their view of the odds that the patient had meningitis the evening before when they were engaged in decision making and then discuss the probabilistic thresholds for doing an LP and for starting antibiotics. More sophisticated trainees might then be asked how they would present their recommendations to the parents and how they would engage them as partners. Blindly following published guidelines should be discouraged, but using guidelines as a starting point for clinical decision making is clearly on the right track. "Really seeing patients," as suggested by the attending physician, should be encouraged, but the clinical thinking needs to be quantified, and the potential consequences of action and inaction explored in light of available evidence. Then, making one's thinking transparent with patients, families, colleagues and trainees, and engaging them fully in the process, finally closes the loop of delivering the best possible treatment.

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The people and events in this case are fictional. Resemblance to real events or to names of people, living or dead, is entirely coincidental. The viewpoints expressed on this site are those of the authors and do not necessarily reflect the views and policies of the AMA.

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Clinical Cases

Confusion over Cholesterol Testing

Physicians must stay up-to-date on changes in clinical treatment guidelines.

Commentary by Kenneth Goodman, PhD, and Eta S. Berner, Ed D

Mr. Fitzpatrick has made an appointment for a general physical exam. At 31 years of age, Mr. Fitzpatrick remains active in his work in information technology, but he has not seen Dr. Anderson since his early 20s. In other words, during today's visit the 2 have a lot to talk about.

A thorough discussion of Mr. Fitzpatrick's family history does not reveal any significant conditions or diseases occurring at abnormally young ages in his relatives (eg, heart disease or cancer). The physical exam is likewise unremarkable, except for slightly elevated blood pressure on 2 separate readings (138/89 mm Hg and 140/89 mm Hg). Dr. Anderson counsels Mr. Fitzpatrick on several lifestyle changes that could affect his blood pressure, including reducing his salt intake and increasing exercise. Dr. Anderson frequently sees patients with elevated cholesterol in his family practice clinic, so he is quite cognizant of the need to monitor HDL- and LDL-cholesterol levels as well as triglycerides. He asks Mr. Fitzpatrick to return for a fasting blood test to check his total cholesterol, HDL, and triglycerides. Though reluctant because of work demands, Mr. Fitzpatrick agrees.

Later that afternoon, Dr. Anderson relates his actions to Dr. Monde, one of his practice partners. She is surprised to learn that he routinely screens patients in this age range for elevated cholesterol. In response, Dr. Anderson cites guidelines published in 2001 by the National Heart, Lung and Blood Institute's National Cholesterol Education Program (<http://www.nhlbi.nih.gov/guidelines/cholesterol/index.htm>). Showing her these guidelines online, he notes that they recommend screening with fasting lipid profiles every 5 years, beginning at age 20, for both men and women. Somewhat perplexed, Dr. Monde recalls that her last reading of the United States Preventive Services Task Force [guidelines](#) (issued in 2001) implied that screening for patients who, like Mr. Fitzpatrick, do not have any major risk factors for heart disease, need not begin until 35 years of age for men or 45 years for women. She also wonders whether the test must be a fasting one.

To help settle their debate, they turn to the National Guideline Clearinghouse, which offers a synthesis of clinical guidelines regarding lipid screening in adults. Their disagreement is confirmed, but they are dismayed to find several other organizations offering their own, sometimes conflicting, guidelines. Both physicians wish that a better method existed to keep them up-to-date with these clinical guidelines—after all, both guidelines are now 3 years old—and more importantly, to know what to do in these complex, conflicting situations.

Unaware of any conflict, Mr. Fitzpatrick arrives the next morning for his fasting blood test.

Commentary 1

by Kenneth W. Goodman, PhD

There are few greater challenges than applying probabilistic data when the stakes are very high. Get it right and no one notices; get it wrong, and, it seems, everyone does. This has been true for millennia. It was true for the physicians of ancient Greece, and it is true for the most ably educated, experienced, and wired physicians of the 21st century. There

is no escape from the need to make a judgment, a decision, under *some* amount of uncertainty.

Not all decisions raise ethical issues. High stakes at the racetrack matter much less than high stakes in the clinic or surgical suite. Because we value life and its handmaiden, health, there is an unequivocal moral duty to base medical decisions on the best available evidence. Surely this is uncontroversial; indeed, it would be perverse to suggest otherwise.

That was the easy part. Matters become difficult when we make 3 simple but crucial observations. First, there is quite a lot of evidence (and there has been for some time); second, some of this evidence is not very good; and, third, reasonable people often disagree about how best to distinguish the strong or good evidence from the other stuff.

One universally acknowledged source of good evidence is the randomized controlled trial, widely regarded as the gold standard for evidence to be applied by physicians and other health professionals. Such experiments are valuable precisely because of their design, which, when applied carefully, reduces confounding effects, identifies statistically significant correlations, and increases confidence in the reliability of findings. While the clinical trial as we know it is just over 50 years old, by the 1970s it was seen to be such a reliable source of biomedical knowledge that it was scandalous that more physicians did not know about those studies that bore directly on the clinical challenges they faced. The British epidemiologist Archie Cochrane gave us the leitmotif that has accompanied the recent evolution of evidence-based medicine:

It is surely a great criticism of our profession that we have not organised a critical summary, by specialty or subspecialty, adapted periodically, of all relevant randomised controlled trials [1].

This is, at ground, the very point of clinical practice guidelines.

Our work would be done—the problem solved—if biomedical science, human biology, and the other organisms, toxins, and sharp objects that cause it to come to grief were simple. None of this is simple. Randomized studies of the same phenomenon sometimes conflict, and their data are not always analyzed correctly or reported with adequate rigor. (The gold standard sometimes needs polishing.) Moreover, clinical trials often reveal subgroup variation or point to our ignorance about groups that were not included in the research in sufficient numbers. Research reduces uncertainty; it rarely eliminates it.

It should therefore not surprise us that practice guidelines are themselves works in progress. It would be nothing less than extraordinary if a guideline got it right for all patients and for all time. Why ever would we presume that the moral imperative to do systematic research and make study results easily available would eliminate a feature of all scientific inquiry, namely, that knowledge rarely accretes in a straight line, or that empirical "closure" is once and for all?

That Drs Anderson and Monde disagree over when to commence cholesterol screening may be taken to represent a lack of an unequivocal standard of care, a case of scientific uncertainty, *and* a challenge to individual physicians who want to "follow the evidence" but find out that matters are not as tidy as they would like. It would be a mistake, however, to believe that this is a new problem for clinicians, or that there is something about taking Professor Cochrane's advice that makes their lives more difficult than before the rise of evidence-based medicine. Medical science has always been probabilistic—and doctors have always sought ways to reduce the consequent uncertainty; what is new is that we now have a means for laying bare this uncertainty and for empowering physicians to apply reasoned judgment to sort out the conflicts [2].

While society, through governments and professional organizations, has a duty to synthesize the best evidence into easily accessible guidelines, this does not relieve clinicians of the duty to know what the guidelines recommend and how different guidelines might make different recommendations. This points to a further moral imperative—seek out continuing medical education. To suggest that conflict among guidelines is reason enough to ignore them all is a little like saying that differences among teams is a reason not to go to the game.

Moreover, the difficult task of managing this uncertainty is only in part a problem of deploying evidence in patient care. In the same way that unresolved differential diagnoses impose a cognitive challenge on physicians *and* a

challenge for them to communicate better with patients about risks, benefits, and alternatives, conflicts among guidelines are a "physician-only" problem solely under paternalistic models of the doctor-patient relationship. That is, uncertainty is a shared or collective problem, and astute physicians know that shared decision making is the correct response. In the case of when to begin Mr. Fitzpatrick's lipid screening, Mr. Fitzpatrick himself needs to be in the loop of uncertainty: *He* needs to know that guidelines differ; *he* needs to know the risks (if they be such) of tardy screening and the waste (if it be that) of premature screening; *he* needs to be asked about his preferences and his tolerance for risk.

This is partly what is meant by "the informed consent process." It is an *ethical* standard that helps resolve the clinical challenge of making a decision under uncertainty. Why ever should a clinician alone shoulder the burden of uncertainty when the rules for consent make clear that patients need to be able to weigh the risks and benefits of their treatments? In fact, sound evidence-based practice needs to include patient values at the outset:

Evidence-based medicine...is the integration of best research evidence with clinical expertise and patient values.... By *patient values* we mean the unique preferences, concerns and expectations each patient brings to a clinical encounter and which must be integrated into clinical decisions if they are to serve the patient [3].

Here, too, we are not eliminating uncertainty, but managing it. In interventions ranging from hangnail-ectomies to neurosurgery, the question, "What are the risks?" has *always* been answered with a list of probabilities spanning the spectrum from just more than 0 to just less than 1. The incorporation of practice guidelines, including conflicting practice guidelines, into clinical decision making surely cannot be insulated from the kinds of uncertainty that already shape clinical practice—and have shaped it since the beginning.

Moreover, the evidence-based project has itself evolved to include mechanisms for self-correction. For instance, concerns about the quality and reliability of scientific publications of randomized controlled trial results have led to the CONSORT (Consolidated Standards of Reporting Trials) statement by a group of leaders in medical publishing, clinical trial research and other fields [4]. CONSORT should be seen as an uncertainty-reducing effort. It is thereby also a confidence-increasing initiative. Critical evaluation of medical journal reports remains a duty for clinicians, but efforts such as CONSORT can ease the burdens of meeting that obligation.

Mr. Fitzpatrick is in good hands. He would be somewhat better off, however, if his doctor were more attuned both to his preferences and to the reasons for guideline variation and less inclined to dismay at the woof and warp of the process by which medical knowledge accumulates.

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Commentary 2

by Eta S. Berner, EdD

Clinical practice guidelines can be thought of as systems that support clinical decision making. The issues raised in this case by the use of traditional clinical guidelines could apply as well to the use of other, more novel clinical decision support systems (CDSS), such as computerized tools designed to assist clinician decision making. CDSS usually link patient-specific information with a knowledge base to provide alerts for dangerous orders, suggest diagnoses, recommend laboratory tests, or critique treatment plans. Some of these systems are integrated into an electronic medical record, and others are stand-alone systems that can be consulted by the physician.

In this particular case, Dr. Anderson made the decision to have Mr. Fitzpatrick return for a fasting cholesterol test based on his recollection of a particular guideline. Should he have relied as he did on his "unaided memory" when there was an information source available? Does the physician have an ethical obligation to the patient to use such systems, especially if they could be accessed conveniently at the point of care? Conversely, are there risks to the patient in using these systems, especially, as in the example in the case, when there may be conflicting information about the appropriate choice of action?

Rationale for Using CDSS

Reviewing the guidelines as Dr. Anderson did after the patient left the office was more effective than spending time surfing the Web while the patient was in the office. A good CDSS, however, might be able to display a synthesis of evidence in a format that would make it easier to apply, even in the short time available for an office visit. PDAs are gaining popularity among physicians and are easily used in an outpatient setting to access drug databases, clinical prediction rules, clinical guidelines, and other forms of decision support. While there is clear evidence that CDSS can reduce medical errors [1], at least in an inpatient setting, there are also studies showing that the CDSS advice is frequently ignored. Eccles and his colleagues in England integrated evidence-based guidelines into physician office computer systems [2]. Their research showed no change in the quality of care after this effort, but they also found that the guidelines were rarely read, much less actively used. Hsieh et al studied the use of allergy-drug interaction alerts and found that 80 percent were overridden by the clinicians who received them [3].

Part of the reluctance to use available systems may lie in the dilemma faced by the physicians in this case—that the evidence is conflicting or that the unique clinical situation justifies overriding a generic guideline. But there are other reasons the advice is not followed—reasons that may not be as clinically or ethically justifiable. Tamblyn et al found that when CDSS recommended a change in medication prescribed by another physician, physicians were reluctant to follow CDSS advice, but they were more comfortable changing their own treatment plans on that advice [4]. As the evidence base for clinical decision making improves, and the technology to make that evidence easily accessible during the clinical encounter becomes available, it is likely that the standard of care may require use of these systems. There is even legal precedent relating to the use of technology in maritime law that, if found applicable to health care, could hold physicians liable for failure to use available technology, even if such use is not yet part of the standard of care [5].

Risks of Using CDSS

The evidence for the benefits of CDSS in reducing harm to patients has led the Leapfrog Group to make clinical decision support in physician order entry systems a cornerstone of its patient safety agenda [6]. Yet there are also risks in using this technology. If Drs Anderson and Monde decided to use automated guidelines, which guidelines should they use? When guidelines are fully or mostly integrated into an order entry system, the source of the recommendations may not be known to the user. The invisibility of the source may be particularly problematic when the data conflict, as in this case.

Knowledge base maintenance may also be a problem in at least 2 respects. First, in this case, some of the guidelines

were up to 4 years old, and it was not always clear whether the guidelines were not updated because the evidence behind them had not changed (and hence, the guidelines were still valid) or whether the evidence had changed and the guidelines had not been revised to reflect that evidence. Second, while accurate physician documentation is an ethical and legal imperative, documentation in clinical charts is often far from complete and may not be accurate. When this incomplete information forms the input for clinical decision support systems, even a well validated system may not produce accurate results, potentially putting patients at risk for harm. Hsieh et al found that many clinician overrides of CDSS drug-allergy alerts were attributable to inaccurate allergy lists in the paper chart as well as in the automated system [3]. One growing concern is over-reliance on a faulty system because the clinician may fail to recognize when the system is incorrect. Tsai et al found that residents' interpretations of electrocardiogram (ECG) data when they had access to an automated decision support system that gave an incorrect interpretation were worse than their unaided performance [7]. Because legally and ethically the physician—and not the computer—is still the decision maker, clinicians must be able to judge how to identify appropriate sources for clinical decision support.

Guidelines for Use of CDSS

The Health on the Net Foundation has developed a code of ethical practices for Web sites that provide health information [8]. Many of these guidelines apply to clinical decision support systems as well, eg, the knowledge base should be credible, based on best evidence, and updated regularly, and the source of the data should be clear to the user. To prevent users from relying on obsolete information, at least one of the drug databases available for PDAs provides regular updates and disables its system if the user does not access the updates. The systems should be well validated, and the American Medical Informatics Association and other organizations have advocated local software review committees to monitor performance within each organization to assure that systems are performing properly in the local environment [9]. There should be a mechanism for physicians to override the system, but they should also be required to document the reason for the override, so that the reasons can be reviewed, discussed if necessary, and ultimately be used to improve the system itself.

Finally, the CDSS must be integrated into the workflow, or else even the best system will not get used. In this case, the Web site that compared the guidelines was useful for the doctors to study, but was probably too cumbersome, with too much information, to integrate at the point of decision making. CDSS fail to be used routinely if it takes too much time to enter data or to read and digest the information they provide. Also, too frequent alerts for inappropriate reasons can result in the important suggestions getting ignored.

In summary, Drs Anderson and Monde can be optimistic that there are technologies that can help keep them up-to-date, but they will need to be aware of the strengths and limitations of these systems to properly avail themselves of these potentially life-saving sources of information.

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Clinical Cases

Preoperative Screening: Medical or Legal Guidelines?

Clinical judgment and experience often trump evidence-based practice guidelines in physicians' medical decision-making process.

Commentary by Mark Tonelli, MD, and Erin Egan, MD, JD

Ms Wannamaker is tired of visiting the emergency department at her community hospital, but on this occasion, her abdominal pain is simply too excruciating to let it go. A working mother of 2, Ms Wannamaker is not apt to let a little stomach pain keep her down. With a sharp wit, she would be quick to tell you about her struggles and accomplishments over her 49 years of life. As Dr. James enters the room, she is happy at the sight of a familiar face and manages to let out a partial smile.

"Hello, Ms Wannamaker. I'm sorry we see each other again under these circumstances. How is your stomach today?"

"It's the same old thing, only worse this time. Still hurts on the right side, right about here," she says, pointing to the right upper quadrant. "And it happened again after I cheated on my diet the other day, you know, at the fast food place."

"How long has the pain been going on?" Dr. James asks.

"About a full day and then some. Plus I feel like I might throw up. Do you think it's related to those gallstones or that colic you talked about last time?"

"It just might be, but let's talk a bit more and then have a look..."

The only abnormal findings in Dr. James's physical examination include a slightly elevated temperature (37.9° C) and pain in the right upper quadrant upon palpation. The relevant blood test results are within normal limits. Dr. James, already aware that Ms Wannamaker's biliary colic might now be acute cholecystitis, orders an ultrasound examination that confirms the diagnosis.

"Ms Wannamaker, I'm sorry to tell you that we'll need to get surgery involved. As I mentioned last time, that gallbladder of yours needs to come out..."

To help his surgery colleagues, Dr. James begins the indicated treatment for acute cholecystitis and preoperative screening, as he often does. He adds an ECG and further blood work (eg, coagulation studies).

Later in the day, Dr. Thorp, the general surgeon, comes to discuss the case with Dr. James and concurs with the diagnosis. Somewhat glibly, Dr. Thorp mentions, "I see you're still ordering those coagulation studies for preoperative screening across the board. You know, we stopped doing that for patients without a suggestive medical history a while ago. For low-risk procedures, it's not worth it. Costs too much and is probably unnecessary."

"I know, I know. But like I said, it would only take 1 adverse event and 1 lawsuit to ruin a career. Someday you'll thank me."

Commentary

by Mark R. Tonelli, MD, MA

In this era of evidence-based medicine (EBM), Dr. James seems either very brave or very foolish to recommend a course of action that appears contrary to the best available evidence produced from clinical outcomes research. Certainly, if his decision to order coagulation studies for Ms Wannamaker stems only from force of habit, a decades-old pattern of practice that sends his unthinking hand over the lab order form producing an invariable pattern of checked boxes, his ordering would be indefensible. But Dr. James does have a reason for ordering the test, not one based on clinical research but on a concern regarding legal liability, should a bleeding complication occur with Ms Wannamaker's diathesis having been undetected prior to surgery. His reason is not a scientific one, certainly not evidence-based, but it cannot simply be dismissed out of hand. Rather, one must consider whether his reason for ordering the test is sufficient to outweigh, or "trump," the clinical evidence that suggests a contrary course of action.

Clinical judgment in medicine has traditionally been understood to involve different kinds of reasons and reasoning. The EBM movement has sought to make reasoning from empirical evidence, derived from well-designed clinical research, the preeminent and preferred form of clinical reasoning, initially de-emphasizing all others. But other kinds of medical knowledge exist and remain valuable [1]. Experiential knowledge, gained directly from the practice of clinical medicine, provides a direct and personal foundation for clinical practice. Similarly, the understanding of physiologic principles and adherence to a theory of disease and healing form another knowledge base that may influence clinical decisions. Each of these kinds of medical knowledge has strengths and weaknesses when invoked as a warrant for medical decision making. They differ in kind, not in degree, and none, including empirical evidence, necessarily takes precedence over the others. That is, empirical evidence is not necessarily more prescriptive or compelling than clinical experience or pathophysiologic rationale in any particular case. The importance of one over another varies depending on the specifics of the case at hand [2]. For instance, low tidal volume ventilation improves outcome in populations of patients with respiratory failure due to acute respiratory distress syndrome (ARDS). But if a particular patient with ARDS develops malignant ventricular arrhythmias each time the tidal volume is reduced and a respiratory acidosis develops, the clinician faces a compelling pathophysiologic reason not to reduce the tidal volumes in that patient despite the imperative of the empirical evidence.

Two other topics, in addition to these 3 different forms of medical knowledge, are important in considering any clinical decision. First, the preferences of the individual patient may be paramount. Even the best empirical evidence can only tell us what treatments are most likely to produce a specific outcome; whether that outcome is relevant to an individual patient—and worth the associated costs or burdens—requires an understanding of that person's goals and values. Second, one must always consider system features: the economic, logistic, legal, and cultural barriers or facilitators of care. The cost, availability, or legality of specific interventions may preclude use even in the setting of strong empirical and experiential evidence in support. For instance, studies that demonstrate that early revascularization with balloon angioplasty improves outcomes in myocardial infarction will be neither helpful nor prescriptive in a community that does not have the resources or personnel to operate a cardiac catheterization lab 24 hours a day. More subtly, the very system of health care delivery, as well as professional and societal values, may appropriately influence decisions regarding the care of individuals.

Expert Judgments

Dr. James, presumably with full knowledge of the relevant research, has decided to act in apparent disregard of that empirical evidence in ordering coagulation studies on Ms Wannamaker. He does so invoking an argument based on the health care delivery system in which he operates. This system feature cannot simply be dismissed because it is not based on empirical evidence; rather it must be examined more carefully to see if it merits relegating that kind of evidence to secondary importance. Certainly Dr. James could support his decision by noting that the US legal system relies on the testimony of experts rather than empirical evidence, that the legal notion of standard of care bears no relationship to evidence-based guidelines, and that juries may award for the plaintiff in spite of evidence-based practice decisions [3]. And certainly the cost of a malpractice suit, in personal and financial terms, can be huge. Dr. James, given the system in which he practices medicine, can defend his choice as the most prudent. We might disagree with the relative weighting he assigned to the avoidance of liability, but no appeal to clinical outcomes research will likely be persuasive in changing his mind.

In the current era of evidence-based medicine, knowledge and understanding of the empirical evidence is absolutely necessary for the delivery of quality medical care. But such knowledge is not sufficient for optimal clinical practice. Rather, clinicians must continue to utilize all the forms of knowledge available to them, to solicit patient goals and values, to understand the relevant features of the system in which they practice. They must be able to negotiate these topics in a way that results in the best advice or treatment for an individual patient. Clinical judgment still demands complex reasoning skills. In the absence of sound clinical judgment, thoughtless adherence to the evidence or any other single source of medical knowledge will result in the practice of "cookbook" medicine.

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Commentary 2

by Erin A. Egan, MD, JD

The exchange between Dr. James and Dr. Thorp highlights a common tension in medicine: how should clinical decisions be made? Dr. James is advocating a defensive strategy, while Dr. Thorp apparently favors adherence to clinical guidelines. Answers to several questions are essential for resolution of this tension. First, what is the basis for the development of the guidelines in question? Second, does adherence to guidelines have any legal effect? Third, does defensive medicine actually protect physicians from liability? Finally, what is the right thing to do?

Clinical guidelines are standardized protocols for evaluation or treatment. They may be very broad or specific to a particular manifestation of an illness, a particular clinical context, or a particular patient population. Ideally, guidelines are based on the best clinical evidence available. There are even guidelines for developing effective and reliable guidelines, emphasizing the importance of evidence in guideline development [1]. Both the Institute of Medicine and the American Medical Association have addressed the issue of quality guidelines as a policy matter [2,3]. Well-developed guidelines reflect the best evidence on the issue and base management or decision recommendations on the probability of generating the best outcome.

As Dr. James notes, some guidelines are developed for cost containment reasons, and other guidelines reflect more of a group consensus on an issue without a formal evidentiary basis. Because guidelines are developed for these disparate purposes, it is important for any clinician to be aware of the purpose and foundation of the guidelines in question. High quality, evidence-based guidelines attempt to distill out those clinical practices that generate the best outcomes; the guidelines attempt to formalize the results of an evidence-based medicine approach which is defined as the "conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients" [4]. Therefore, the crucial initial step in the application of guidelines in clinical practice is to evaluate the guidelines themselves and determine what they will contribute to a particular clinical situation.

Medical Guidelines and the Law

Guidelines do have legal relevance, although this is an area that is still poorly defined and evolving. Few legal cases

have actually involved use of guidelines. One search of all published cases in US courts between January 1980 and May 1994 found only 37 cases [5]. While this seems to indicate that guidelines are not a major influence in legal decisions, evidence indicates that attorneys rely heavily on guidelines in determining whether or not to file suit and whether or not to settle a suit before trial [6]. In addition, there is some evidence that lawsuits occur more frequently when physicians deviate from clinical protocols or guidelines, and in 79 percent of lawsuits where there was deviation from an existing guideline, that deviation was the main allegation in the lawsuit [7].

To establish how Dr. James and Dr. Thorp should be using guidelines to direct any aspect of Ms Wannamaker's care, the first issue is the source of the guidelines. There are several sources of guidelines for preoperative evaluation, some based on particular clinical scenarios like cardiac risk, some emphasizing cost control, and others emphasizing the evidence base for deciding which tests improve outcomes. If the guidelines Dr. Thorp is referring to are evidence-based guidelines created to facilitate high quality care, then Dr. James is less likely to be correct in thinking that deviating from them will protect the patient or himself.

After determining whether the guidelines apply to Ms Wannamaker and purport to further goals that Dr. James and Dr. Thorp value, Dr. James should be aware that most of the evidence regarding guidelines indicates that it is legally beneficial to follow guidelines, not deviate from them. Legal literature contains more extensive analysis of how to use guidelines to prove care was poor than how to use them to prove care was competent, but generally it is to the physician's advantage to show compliance with existing guidelines [6]. This does not mean that guidelines *must* be followed, and it does not mean that the law expects physicians to use guidelines in the place of clinical judgment. On the rare occasions that guidelines are used in legal situations, however, they are either used to allege negligence because a physician deviated from them, or offered as a defense to suggest that proper care was rendered by a physician because the care was in accordance with guidelines.

Dr. James is practicing defensive medicine by ordering tests that are not clinically indicated and offer no clear benefit to the patient but do offer a potential benefit to the physician if a problem occurs later. Another perspective on defensive medicine is that it does benefit the patient in the rare instance that an unexpected abnormality is detected in time to prevent an injury. Good evidence-based guidelines, however, assess outcomes; therefore, the guidelines should have an inherent determination of the safety or risk of the recommendations. Defensive medicine, practiced solely in the nebulous hope that someday it will save the provider from being sued, costs an estimated \$5 billion to \$15 billion annually [8]. When issues of justice in health care are as tangible and serious as they are in the United States today, increasing costs for purely hypothetical benefit is difficult to justify.

Guidelines are useful tools for synthesizing a large amount of information and evidence to solve a clinical problem. They promote the laudable goal of incorporating the best possible evidence into patient care decisions. Ultimately, however, patient care decisions should be based on the best interest of the patient, consistent with ethical standards. Evidence is one aspect of determining what is in the patient's best interest. Clinical judgment, technical factors, and the patient's wishes are additional and indispensable considerations. Making medical decisions to further the physician's own interest (protecting him- or herself from future liability) is not appropriate in light of the ethical considerations of beneficence and justice. Making poorly informed decisions in an effort to protect a patient from a rare complication is ethically appropriate but scientifically inadequate. Guidelines, when used properly by clinicians in their proper context and for their proper indications, resolve some of this scientific inadequacy and assist the physician in working with the patient to make the best treatment decisions.

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A New Process for Writing Clinical Guidelines

The GRADE system aspires toward uniform standards for medical practice guidelines.

Brian Horvath, MPH

GRADE Working Group. Grading quality of evidence and strength of recommendations. *BMJ*. 2004;328:1490-1494.

Proposal of new methodologies for writing clinical practice guidelines is now a common occurrence. Many groups and organizations, including the American Medical Association and the Institute of Medicine, have proposed careful procedures for creating guidelines [1-4]. The underlying objective of practice guidelines is to assist clinicians and patients in making difficult health care decisions. Sometimes even seemingly simple decisions require the assistance of guidelines (see, for example, the 3 clinical cases in this issue of *Virtual Mentor*). The need for guidelines arose partly from concerns over unexpected variation in medical care [5-6], and from the desire to control health care costs [7].

As more groups have begun using practice guidelines, critiques of their methodologies have also evolved. Some studies have expressed concern that guidelines do not adhere well to their methodological standards [8-9]. Another concern is that guideline recommendations are not timely due to infrequent revision [10]. Finally, the focus of early guidelines on the effectiveness of interventions may have confused users that the strength of a recommendation is contingent upon the magnitude of a clinical response rather than upon the strength of supporting evidence that a clinical response does or does not exist [11].

Concerned about this current health care environment, not only in the United States but other countries as well, the GRADE working group has proposed a new process for writing practice guidelines [12]. According to their Web site [13], the Grading of Recommendations, Assessment, Development and Evaluation (GRADE) Working Group is an international collaboration of people intent on creating a common, sensible approach to practice guidelines. Their previous work has examined the use of numbers and symbols to communicate grades of evidence from existing guidelines [14]. Now the GRADE group has moved beyond the communication of existing information to propose a comprehensive and systematic methodology for creating new practice guidelines.

After opening with a convincing explanation of the need for practice guidelines, the GRADE article deftly outlines the difficult choices that practitioners and patients must routinely make when faced with clinical decisions—choosing which potential outcomes to consider, what evidence is important to each outcome, and how to judge the quality of that evidence. The authors criticize the current environment where the presence of several competing guideline systems with differing methodologies causes confusion. The article then illustrates the many positive features of practice guidelines, such as the potential to prevent errors and disseminate clinical information.

To accomplish these goals, the authors propose an open system for making judgments about the quality of evidence and the strength of recommendations. For example, the GRADE system requires reviewers to rigorously examine 4 key and sequential elements when judging the quality of evidence: study design, study quality, consistency, and directness. Doing this, they maintain, should lead to a concise and explicit statement about the quality of evidence.

The next major consideration in the GRADE system is the strength of recommendations. The article highlights the trade-offs between benefits and harms inherent in making a recommendation, acknowledging that the outcomes and

their seriousness may vary greatly depending on the patients' clinical histories and social environment. Partly to address these issues, the GRADE clinical guidelines would be specific to patient groups and practice settings. While the GRADE system stresses that the foremost considerations are health benefits and harms, it also suggests the role of incremental health care costs. Unfortunately, like many other guideline systems, the GRADE proposal offers little in response to the vexing questions of when or how such costs should be considered. One of its aims, however, is to make the process more transparent and open to public scrutiny, and this is a laudable goal.

The GRADE system is a thoughtful approach to an acknowledged problem. Writing clinical guidelines challenges the authors to make simple and concise recommendations while still retaining enough complexity to be useful under a variety of individual circumstances. The GRADE system proposes a specific and lengthy process to help retain the needed complexity while ultimately producing a clear recommendation. The process clearly identifies all decision points, allowing others to more fully evaluate each guideline.

The authors make clear that their article is only a summary of their methodology; some important questions remain unanswered. For example, the article does not discuss the selection of panel members to write the guidelines. In a system with explicit methodologies for making recommendations, determining panel composition also requires clear procedures. The identity of panel members greatly influences how users view the guidelines. Furthermore, the article does not address the problem of time. An ideal guideline system would adjust recommendations to changes in technology and the practice environment over time, but no such process is identified in this article. Arguably, the process by which guidelines are updated is as significant as that by which they're developed; out of date guidelines may, in some cases, be worse than no guidelines at all. A final concern is deciding which outcomes are most important to consider. Although the article provides admirable methodologies for evaluating given outcomes, choosing which outcomes are relevant is a value judgment that would benefit from more discussion.

These caveats are not flaws as much as areas in need of amplification. The real issues are not procedural limitations but rather the perceived need for a new system. The article proposes a strong process for writing clinical guidelines, but it is not obvious that this system is vastly superior to any of the systems already in use. The presence of multiple guideline systems is confusing. Having one standardized system for writing guidelines would be beneficial, and the GRADE system is admirable. Of more use than designing a new system, however, are articles that specifically compare and contrast existing systems with the ultimate goal of standardizing one approach over all others. After choosing one process for writing clinical guidelines, future discussions can shift from technical issues of methodology to the more clinically relevant difficulties inherent in medical decisions.

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Clinical Pearl

The Impact of Recent Clinical Trials on National Cholesterol Education Program Adult Treatment Panel III Guidelines

Recent clinical trials have led to updates in the management of patients with high cholesterol.

Niharika P. Bansal

Introduction

The management of elevated cholesterol (which follows screening, as described in Case 2 of this issue) centers around a set of evidence-based guidelines put forth by the Third Report of the National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults, known as the Adult Treatment Panel III (ATP III). The ATP III published its final report in December 2002 [1,2]. The ATP III guidelines provide useful information for clinicians and clinical researchers, and address issues related to the detection, evaluation, and treatment of cholesterol disorders. The guidelines were based on randomized clinical trials, epidemiologic studies, and smaller clinical studies conducted since the ATP II guidelines were published in 1994 [3].

Five large randomized clinical trials have been conducted since the 2002 ATP III guidelines. The results of these trials led the NCEP to issue modifications to the ATP III guidelines in July 2004. This clinical pearl reviews the ATP III guidelines and the 5 randomized clinical trials with an emphasis on how these results might impact patient management.

ATP III Detection and Evaluation Guidelines

In the ATP III algorithm, the first step in analyzing a patient is determining the lipoprotein levels after a 9-12 hour fast. While the level of total cholesterol correlates with cardiovascular risk, the level of LDL-C determines the overall risk of adverse cardiovascular events. Higher HDL-C levels are protective against cardiovascular events. The ATP III classification is depicted in [Table 1](#).

Following lipid profile determination, patients are classified on the basis of risk factors. Patients who are determined to be *high risk* have coronary heart disease (CHD) or CHD risk equivalents. CHD risk equivalents are risk factors that pose a risk just as high as CHD. These include noncoronary forms of cardiovascular disease (CVD), such as symptomatic carotid artery disease, peripheral vascular disease, abdominal aortic aneurysm. Other risk equivalents are diabetes, or the combination of 2 or more of the following risk factors: smoking, hypertension, low HDL, a family history of premature CHD, or age (45+ for men; 55+ for women).

Lipid levels, medical history, and risk factors allow the classification of patients into different risk categories that are useful in determining the treatment strategy. Treatment consists of behavioral and pharmacological approaches. The behavioral approach is known as therapeutic lifestyle changes (TLC) and involves exercise, weight management, and diet modification. Pharmacological approaches include 4 main classes of drugs:

1. HMG Co-A reductase inhibitors (statins)
2. Bile acid sequestrants
3. Fibrates
4. Nicotinic acid

Of these drugs, statins cause the largest reductions in LDL-C and triglycerides and a significant elevation in HDL-C. Because of their dramatic effects and tolerable side effect profile, statins have become the focal point of cholesterol management, with the addition of the other drug categories as deemed necessary. A stratification of risk types along with the ATP III goals and treatment guidelines appears in [Table 2](#).

Summary of Recent Clinical Trials that Impact the ATP III Guidelines

Since the publication of the ATP guidelines in December 2002, 5 clinical trials have examined the role of statins in the treatment of cholesterol disorders [4-8]. The details of these trials are summarized in [Table 3](#).

The main conclusions of each trial follow.

1. *HPS*. This study had several important findings:

- Patients with LDL-C \geq 130 mg/dL benefited most from LDL-C reductions. If statins alone cannot achieve the goal of $<$ 100 mg/dL, maximal dietary therapy and a drug from another class may help achieve this goal [9-11].
- In patients with LDL-C of 100-129 mg/dL, HPS demonstrated a substantial benefit of instituting a standard dose of statins to achieve a 30 to 40 percent reduction in LDL-C levels.
- In patients with low LDL-C $<$ 100 mg/dL, HPS demonstrated an even greater risk reduction in high risk patients by lowering LDL-C $<$ 70 mg/dL.
- In diabetic patients with CVD, statin administration to achieve an LDL-C goal $<$ 70 mg/dL is reasonable, regardless of baseline LDL-C. In diabetic patients without CVD, HPS supports an LDL-C goal of $<$ 100 mg/dL, although the benefit of statins in patients who are close to that endpoint may be less pronounced.

2. *PROSPER*. The PROSPER study demonstrated decreased composite endpoint, major coronary events, and CHD mortality as a result of LDL-lowering therapy in older patients with or without established CHD. Although an increased cancer risk was noted, this is the only trial to date that describes an increased risk of cancer.

3. *ALLHAT-LLT*. Unlike others, this study did not demonstrate a decreased risk in hypertensive patients. This could have been due, however, to the large crossover of higher-risk subjects to the lipid-lowering treatment arm, the unblinded nature of the study, and the difference in cholesterol between patients on pravastatin and those receiving usual care. The significant reduction in cardiovascular events in African Americans supports the ATP III recommendation that the goals of LDL-lowering therapy should not be modified on the basis of ethnicity [12].

4. *ASCOT-ALL*. This study supported the therapeutic option of administering LDL-lowering therapy to reach a goal LDL-C $<$ 100 mg/dL in patients at moderately high risk with an LDL-C 100-129 mg/dL. (The study was cut short because of the pronounced risk reduction of cardiovascular events in patients with multiple CVD risk factors.)

5. *PROVE IT*. This study tested the effects of intensive LDL-C lowering beyond standard targets on the incidence of major coronary events. High levels of atorvastatin caused an even greater reduction in composite endpoint, which was correlated with a 35 percent lower LDL-C level in patients treated with high levels of atorvastatin. This study lent support to the HPS study, suggesting an optional therapeutic threshold for LDL-C $<$ 70 mg/dL in high risk patients. It also demonstrated the benefit of LDL-C $<$ 70 mg/dL after acute coronary syndromes.

Modifications to ATP III Guidelines after Recent Clinical Trials

Given these results, modifications to the ATP III guidelines are now proposed. These modifications are summarized in [Table 4](#).

The guidelines recommend the initiation of TLC in (a) high-risk patients with LDL-C \leq 100 mg/dL, (b) moderately high or moderate-risk patients with LDL-C \leq 130 mg/dL, or (c) low risk patients with LDL-C \leq 160 mg/dL. In patients with high risk or moderately high risk who have lifestyle-related risk factors like obesity, metabolic syndrome, elevated triglycerides, or decreased HDL-C, TLC is recommended regardless of LDL-C levels.

The recommendations for modifications to the ATP III treatment algorithm impact patients with *high risk* the most. While the LDL treatment goal is still LDL-C $<$ 100 mg/dL, HPS and PROVE IT support an optional treatment goal of LDL-C $<$ 70 mg/dL in high risk patients, especially diabetics, even when the baseline or on-treatment LDL-C is already $<$ 100 mg/dL. Adding nicotinic acid or fibrates to statin therapy can also help reach the therapeutic goal. The studies demonstrate benefits of lowering LDL-C by 30 to 40 percent, even in patients whose baseline LDL-C is 100-129 mg/dL. These data support lowering the threshold at which to consider pharmacologic therapy from \geq 130 mg/dL to \geq 100 mg/dL in high-risk patients.

For patients with *moderately high risk*, the LDL treatment goal is still LDL-C $<$ 130 mg/dL. For patients with baseline or on-TLC levels of 100-129 mg/dL, initiation of an LDL-lowering drug is an appropriate therapeutic option to achieve a goal of LDL-C $<$ 100 mg/dL. The goal with statin administration should be a 30 to 40 percent reduction in LDL-C.

The guidelines for patients with *moderate* or *low risk* have not changed.

Conclusions

The results of recent clinical trials, including HPS, PROSPER, ALLHAT-LLT, ASCOT-LLA, and PROVE IT, support the modification of the ATP III guidelines for treatment of cholesterol disorders. The modifications suggest that, for some patients, more intensive lowering of LDL-C is beneficial for reducing cardiovascular event risk. The revised guidelines offer alternative therapeutic goals of LDL-C $<$ 70 in high risk patients and LDL-C $<$ 100 in moderately high risk patients. Further studies will help determine if this therapeutic option should be incorporated into the guidelines for all patients.

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Health Law

What Counts as Expert Medical Testimony?

Medical standards of care and legal standards of reliability and relevance sometimes conflict in courtroom settings.

Mollie E. O'Brien

Introduction

In *Daubert v Merrell Dow*, the Supreme Court determined that scientific testimony, including testimony by medical experts, is admissible as long as it is both "relevant" and "reliable" to assist a jury in their fact-finding determination [1]. *Daubert* sets a more permissive standard for the kind of expert testimony that will be considered admissible. On the other hand, *Daubert* vests the judge with more discretion to decide whether the expert provides the court with "good" or "bad" science. Ultimately, physicians and scientists should be aware that judges still require sound science in their courtrooms.

Daubert v Merrell Dow

Jason Daubert and Eric Schuller were both born with severe limb reduction birth defects. Such abnormalities were arguably linked to their mothers' ingestion of Bendectin, an anti-nausea drug given to pregnant women. Shortly after Jason and Eric's births, and after hundreds of law suits alleging that the drug triggered teratogenic effects, Merrell Dow Pharmaceuticals Inc, a unit of Dow Chemical Co, withdrew the drug from the market in 1983 [2].

Jason and Eric also sued Dow. Alleging pharmaceutical products liability, Jason and Eric had to provide pre-trial evidence suggesting that: (1) Dow owed and breached a duty of care to them; and (2) Bendectin actually *caused* their particular birth defects [3]. In order to provide supporting evidence for the latter, Jason and Eric used scientific evidence and medical testimony.

In its own defense, Dow presented a well-credentialed medical expert, a physician and epidemiologist, Dr. Steven H. Lamm. In his affidavit, Lamm stated that no published report confirmed Bendectin caused teratogenic effects in humans [4].

The plaintiffs did not directly refute Lamm's characterization of the published record. In fact, both plaintiffs and defendant acknowledged that all published data gave no indication that Bendectin caused birth defects [5]. Instead, Jason and Eric obtained 8 of their own experts who testified that in their *unpublished* research, they found a pharmacological link between Bendectin and teratogenic malformations through in vitro and in vivo animal studies. Additionally, 2 of the experts testified that if Dr. Lamm's epidemiological evidence were re-analyzed, it could arguably support a finding that Bendectin caused teratogenic effects in humans.

Despite the unquestionable credibility of Jason and Eric's witnesses, the District Court of California found that the testimony based on unpublished scientific results was not legally relevant to establish that Dow's product caused their birth defects. After discovery and prior to any arguments being presented at trial, the court dismissed the case on "summary judgment." A case can be dismissed on summary judgment if one party establishes that the other side has not proved sufficient facts to support their legal claim. The trial judge found that animal, chemical, and in vitro studies were insufficient to establish that Bendectin caused birth defects in humans [5]. Finding Dow's epidemiologic

evaluation more persuasive, the judge concluded that Jason and Eric's scientific evidence was inadmissible because it was not "generally accepted" by epidemiologists, the field of study that could best judge the veracity of such data [5].

On appeal, the Ninth Circuit, the federal court of appeals for California, Washington and Oregon, affirmed the lower court decision. It held that, based on the existing rules of evidence at the time, expert testimony was only admissible if it was "generally accepted by the scientific community" and "subjected to verification and scrutiny by others in the field" [6]. Consequently, the Court rejected the re-analysis data produced by Jason and Eric's experts. The court adopted the reasoning that this data was inadmissible solely because it had not been subjected to the peer review process that is associated with publication of scientific articles.

The Supreme Court agreed to review the *Daubert* case, stating that there was a general lack of uniformity among the lower federal courts over what to accept as expert testimony [7]. Some courts, like the *Daubert* District Court, used the "general acceptance" test for expert testimony that had been established in the 1923 decision of *Frye v United States* [8]. Other courts rejected "general acceptance" and admitted testimony according to Rule 702 of the Federal Rules of Evidence, as established in 1973.

Writing for the high Court, Justice Blackmun with the support of 7 out of 9 justices held that the Federal Rules of Evidence and not the "general acceptance" test should control the admissibility of expert testimony [9]. The Supreme Court reasoned that the Federal Rules of Evidence were far more liberal than the general acceptance [10] test. In effect, Rule 702 deems all "relevant evidence admissible" [11]. So, while *Frye's* general acceptance standard could have been part of the lower court's inquiry, the court should not have ended its investigation there [12]. By its very language, 702 expressly permits any scientific, technical, or other specialized knowledge, assuming such knowledge will assist the Court to understand evidence.

Once testimony is deemed "relevant" to assist the jury, it must also prove "reliable." To this, the Court simply stated that the testimony's "evidentiary reliability will be based upon its *scientific validity*" [12]. Although the Court expressly refused to adopt a comprehensive checklist for determining whether expert testimony is in fact reliable, it offered a non-exhaustive list of what lower courts might consider in the future. Some of these considerations include whether:

1. the theories and techniques employed by the scientific expert have been tested;
2. they have been subjected to peer review and publication;
3. the techniques employed by the expert have a known error rate;
4. the theories and techniques are subjected to standards governing their application; and
5. the theories and techniques employed by the expert enjoy widespread acceptance [12].

While the absence of one of these factors is insufficient to exclude expert testimony, the absence of more than 1 may indicate that the testimony lacks scientific validity. The district court had found *Daubert's* expert testimony insufficient based solely on 1 of the reliability criteria—that the research presented had not been published. So, the Supreme Court ordered the lower court to revisit the evidence, utilizing this new standard of "relevance and reliability" to guide its decision.

How *Daubert* Applies to Physicians

Some commentators have argued that the *Daubert* ruling permitted more "junk science" into the courtroom. Others claim that *Daubert* leaves the burden of identifying and excluding inappropriate testimony to the judge and the court system [13]. That is, if evidence lacks relevance or reliability, vigorous cross-examination, presentation of contrary evidence, and careful instructions to jurors will eliminate this evidence. At the very least, then, these internal checks of judicial "gate keeping" will insure that the expert's testimony is based on science that is methodologically and theoretically sound enough to satisfy the reliability criteria of *Daubert*.

The *Daubert* Rule means that experts must present opinions that are specifically relevant and highly developed in order to withstand the scrutiny of the judge and opposing counsel. The witness will be appropriate if, as a prerequisite, her experience contributes some meaningful explanatory purpose to the party's case.

The AMA's *Code of Medical Ethics* agrees. Opinion 9.07 states, "Medical experts should have recent and substantive experience in the area in which they testify and should limit testimony to their sphere of medical expertise" [14]. Hence, a physician will both comply with *Daubert* and the ethical standards of the medical profession if her clinical, research, or academic experience helps explain a party's case.

Although the *Daubert* Court did not employ express "standard of care" language, the list of considerations in the Court's opinion—particularly whether the opinion has been peer reviewed and gained widespread professional acceptance—resembles the criteria that the medical profession employs in determining standards of care. Indeed, from an ethical perspective, the degree of one's clinical experience and knowledge necessarily conditions and ultimately limits one's ability to testify in the first place.

While it is true that physicians are obligated to serve as patient advocates, in court they have a greater duty to testify to their truthful, objective beliefs. On the stand, a physician is bound by an obligation "to aid and assist in the administration of justice" rather than to "insure a favorable outcome for the patient" [14]. Providing relevant and reliable testimony under *Daubert* will surely satisfy this ethical duty.

Compliance with the *Daubert* standard insures that physicians acting as expert witnesses provide relevant and reliable testimony to the Court. In order for testimony to prove both relevant and reliable, physician opinions are subject to aggressive scrutiny both by judges and opposing counsel. From an ethical perspective, the *Daubert* requirements complement provisions of the *Code of Medical Ethics*. Complying with these ethical provisions from the beginning, then, may insure that testimony satisfies legal rules of admissibility, relevance, and reliability later.

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6. *Daubert v Merrell Dow Pharmaceuticals, Inc.*, 951 F.2d 1128 (9th Cir. 1991).
7. See *Daubert*, 509 US at 598.
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Cost and Clinical Practice Guidelines: Can Two Wrongs Make It Right?

In today's medical economy, cost effectiveness is becoming a bigger factor in developing standardized clinical practice guidelines.

Ellen K. Hummel, MD, and Peter A. Ubel, MD

In the good old days, physicians did what was best for each individual patient in their care, without considering cost or having to figure out whether an HMO or accreditation board was looking over their shoulders. Physicians never worried about practicing "cost-effective medicine," nor did they concern themselves with whether Health Plan Employer Data and Information Set (HEDIS) or some other standardized quality measure would be used to tabulate their performance.

But the clinical world is changing. The medical literature overflows with cost-effectiveness analyses, putting physicians in the awkward position of having to judge whether a particular patient will benefit enough from a specific therapy for that therapy to be cost-effective. Journals are also stuffed to the brim with new clinical practice guidelines (CPGs), nudging physicians to adopt a rapidly expanding array of unfamiliar screening and therapeutic approaches to their patients.

Is it any wonder that physicians regularly express their skepticism about the true relevance of both cost-effectiveness analyses and clinical practice guidelines to their clinical practice?

And yet now, the editors of *Virtual Mentor* have asked us to comment on whether clinical practice guidelines ought to incorporate cost-effectiveness information. At the risk of alienating our colleagues, we plan to discuss why we think the best way to help physicians become more comfortable with both cost-effectiveness issues and with CPGs is to make certain the 2 are inseparable.

Resistance to Practicing "Cost-Effective" Medicine

It is not surprising that physicians disparage cost-effectiveness in health care, given that traditional medical education teaches that they should not consider the cost of medical interventions when treating individual patients [1]. Physicians may also recoil at the idea of cost considerations because they associate such considerations with ever-increasing administrative demands on their time made by third-party payers. What's more, the media bombard us with tragic stories of patients who have been denied needed health care services because they had the misfortune of being enrolled in unscrupulous, greedy, for-profit managed care plans. No wonder most of us would prefer to avoid considering cost-effectiveness in clinical practice.

Nevertheless, the health care situation in this country is making it increasingly difficult to ignore the relevance of cost to clinical practice. On a societal level, more than 40 million Americans lack any kind of health insurance coverage because it is too expensive for them to buy for themselves or through their employers. On a community level, many hospitals are experiencing nursing shortages as the rising cost of providing health care services prevents them from offering more attractive compensation packages [2]. On an individual level, some patients are unable to comply with prescribed medication regimens because they simply cannot afford the high drug prices [3]. But how can we

encourage resistant physicians to control costs when they feel morally obligated to pursue the best interests of their individual patients without regard to costs?

Are clinical practice guidelines the solution?

Resistance to Practicing According to CPGs

CPGs offer a potentially palatable way for physicians to consider the cost-effectiveness of medical interventions. High quality guidelines are based on thorough and systematic reviews of clinical and cost-effectiveness evidence. Moreover, CPGs are often developed by representative panels of experts, including members with scientific, clinical, and economic expertise in a particular topic, as well as patients, ethicists, and representatives of relevant special interest groups. Furthermore, the rationale for the development of guidelines and their cost implications can be made publicly available for ongoing debate and discussion through publication in reputable medical journals. Finally, according to the Institute of Medicine, evidence-based clinical practice guidelines are decision aids that "assist practitioner and patient in discussions about appropriate health care for specific clinical circumstances" [4]. As such, they can provide cost-effectiveness information to physicians without threatening the physicians' autonomy to decide what is best for individual patients.

Despite all of these strengths of CPGs, however, physicians are often concerned that guidelines are tainted by financial conflicts of interest. Take as an example, a recent controversy surrounding the update of the Adult Treatment Protocol III (ATP III) guidelines for the treatment of cholesterol in adults, issued in July by the National Cholesterol Education Program (NCEP). Although the NCEP has been widely considered a credible source of cholesterol guidelines, the latest update of the ATP III recommendations has been questioned by the Center for Science in the Public Interest (CSPI), in part because most of the panel members who authored the update have relationships with the pharmaceutical industry. Of note, the recent ATP III update includes suggestions that intensification of lipid-lowering therapy beyond previously recommended levels might be beneficial in certain groups of patients [5].

It is impossible to eliminate all conflicts of interest in guideline development. As Barbara Alving, acting director of the National Heart, Lung and Blood Institute notes, "the experts who are most knowledgeable in a subject area are also the same people whose advice is sought by industry, and most guideline panels include experts who interact with industry" [6].

Why Cost-Effectiveness and CPGs Belong Together

Although we do not wish to take a position in the controversy over the ATP III update, we believe that this dispute illustrates precisely the reason why cost-effectiveness should *always* be addressed explicitly in CPGs. As is the case with the ATP III update, an interest group or individual invariably stands to profit from the implementation of any guideline. Therefore, the conflicts of interest of the source of a guideline are necessarily relevant to the perceived value of its recommendations. Although public disclosure of conflicts of interest is an important first step towards enhancing public perception of the objectivity of a source of a guideline, it is not sufficient action to engender trust.

Instead, to increase trust, all guidelines should include explicit information about cost-effectiveness to help physicians better assess the objectivity of the recommendations. Cost-effectiveness information enhances the credibility and usefulness of guidelines by showing their reasonableness. If a guideline recommends more aggressive lipid lowering without presenting evidence that this would be cost-effective, physicians have good reason to be skeptical about the value of this recommendation for their practice. Imagine how differently the cholesterol guidelines would have been received if the panel had shown that their new, more aggressive recommendations were still well within accepted cost-effectiveness ratios despite potential conflicts of interest [7].

Including cost-effectiveness considerations helps establish the credibility of CPGs. At the same time, CPGs help clinicians recognize the importance of practicing cost-effective medicine with their individual patients. CPGs can act as a socially sanctioned standard of care, a signal to clinicians that their pursuit of benefits for individual patients needs to be limited by cost-effectiveness concerns. For example, the US Preventive Services Task Force and the American Cancer Society have issued guidelines incorporating cost-effectiveness data which recommend that

physicians reduce the frequency of screening low-risk women for cervical cancer. In response to these recommendations, many physicians have actually reduced their screening rates. Hence, through CPGs such as these, physicians may be encouraged by groups of peers and respected authorities to restrain themselves from pursuing rare benefits for their patients.

As our current health care system increasingly forces us to become involved with the costs of medical care, evidence-based CPGs should supply us with reliable and objective advice regarding the cost-effectiveness of treatment options. Furthermore, including cost information in guidelines will enhance their credibility with clinicians by decreasing concerns about conflicts of interest.

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Achieving Diversity and Its Benefits in Clinical Research

Strengthened NIH policies of inclusion have resulted in more NIH-funded research including more women and other underrepresented population groups as subjects in medical research.

Vivian W. Pinn, MD

In her Op-Ed article, "Does evidence-based medicine offer fair benefits for all?" [Wendy Rogers](#) notes that evidence-based medicine evokes concerns of justice insofar as the evidence base itself systematically excludes certain groups. She also suggests 2 steps to address the research processes of inclusion: "...require researchers to (1) redesign research, removing the current barriers to participation by those who are disadvantaged...to (2) increase the number of opportunities for participation, either by *increasing heterogeneity* in general research populations, or by *specifically funding* research with disadvantaged subgroups (numerals and emphasis added)." This article provides a response to some aspects of her article by highlighting the United States' National Institutes of Health (NIH) policies for inclusion in biomedical research and the processes used to develop research agendas representative of the health concerns of the communities under study. Recommendations for overcoming barriers that researchers have encountered in recruiting and retaining study participants are also discussed.

A Recent History

Before proceeding, it is crucial to understand the recent history of the movement toward inclusion in research. In the latter 1980s, advocates for systematic inclusion of women in biomedical research were concerned not only with ethical matters but also with a practical challenge. Ethically, equity provided a rationale for demanding attention to research on women's health. But pragmatically, the underlying question was simple: Why shouldn't women be the norm in evaluating how medical interventions would affect them, rather than assuming that studies conducted primarily on men would have the same clinical application for women? Recognizing that the results of biomedical research influence standards of health care and delivery (the topic of this *Virtual Mentor* issue), advocates and policy makers directed attention to ensuring that publicly funded research would benefit all segments of a diverse population of women—and of men.

One consequence of this recognition was the establishment of the Office of Research on Women's Health (ORWH) in the office of the director of the NIH in 1990. Another was an evolving appreciation by scientists and health policy makers that the scientific design of biomedical studies should consider all affected population groups in their specific biological and cultural contexts. Thus, policies were established to ensure the inclusion of women in NIH-funded clinical research, and these were extended to address the inclusion of racial and ethnic minorities. (The NIH follows the Office of Management and Budget in defining 5 basic racial or ethnic groups while allowing for further subgroups.) Evolving research agendas also began to emphasize the need to understand the role of sex/gender and racial/ethnic factors as distinct from other factors such as environment, education, behavior, poverty, age, and access to health care, on biologic and genetic determinants of disparities in health, disease, and health outcomes [1].

Implementation of the NIH inclusion policies is now yielding advances in understanding when important, health care-

related differences exist between genders and among various populations [2-3]. At the same time, implementation has sharpened our perception of the barriers that led to the need for these policies. This need to recruit and retain study volunteers who represent the desired diversity requires scientists and policy makers to examine why these barriers exist and to devise innovative and successful initiatives to overcome them [4].

Inclusion Policies and Processes

The NIH has undertaken many activities—with collaborative input from scientific and professional organizations, researchers, health care professionals, and public advocates—to develop a long-term agenda for priorities in biomedical research across the life span of women [5]. The revision of this agenda, published in 1999, focused not only on conditions that are specific for, or more prevalent in, women (such as breast cancer or lupus) but also on the importance of sex and gender factors in research design and the need to focus on factors that affect underserved populations with disparate health statuses [6]. Public and scientific hearings were held across the country with open participation, allowing the voices of advocates and scientists to reflect health issues of concern to the diversity of communities and individuals [7-8].

Furthering the efforts to identify gaps and set priorities, an NIH-wide working group, with public input, developed the *NIH Strategic Research Plan to Reduce and Ultimately Eliminate Health Disparities* in 1999. The working group defined disparities as "differences in the incidence, prevalence, mortality, and burden of diseases and other adverse health conditions that exist among specific population groups in the United States" [9]. The NIH is the primary federal agency for conducting and supporting medical research through competitive grants to researchers at universities, medical and other health professional schools, and other research institutions across the country and around the world. The NIH has no authority over other funding entities, such as pharmaceutical companies, private organizations and foundations, and other government agencies; thus the policies described here apply only to NIH-funded research. NIH policies regarding the inclusion of women and minorities in clinical research date from 1987 and have evolved through a series of clarifications and revisions to require documentation and adherence.

The current policy, revised in 1994 to meet specifications of the NIH Revitalization Act of 1993 (PL 103-3, which makes inclusion in NIH-funded research a matter of public law), in brief states that:

It is the policy of NIH that women and members of minority groups...must be included in all NIH-supported biomedical and behavioral research projects involving human subjects, unless a clear and compelling rationale and justification establishes...that inclusion is inappropriate with respect to the health of the subjects or the purposes of the research...[10]

Further, NIH must support outreach efforts to recruit and retain women and minorities and their subpopulations as volunteers in Phase III clinical trials in numbers adequate to allow for valid analyses of differences in intervention effect. NIH evaluates the proposed enrollment of each project to determine if the plan to include women and minorities is scientifically acceptable and reflects the prevalence of the condition in diverse populations. The intent is to ensure that scientific norms for health, disease, treatments, and other medical interventions will be applicable to all populations, based upon scientific evidence [11].

The inclusion policy, however, is only useful if researchers are aware of it and supported in implementing it. NIH has prepared the *Outreach Notebook for the Inclusion, Recruitment, and Retention of Women and Minority Subjects in Clinical Research*, which provides information about human subject protections and inclusion issues, frequently asked questions about the implementation of the policy, and information to assist in outreach activities for women and members of ethnic or racial populations [12]. The *Outreach Notebook* emphasizes that effective outreach to potential study participants—some of whom are difficult to access—must incorporate a partnership among these individuals, investigators, community-based organizations, and other relevant stakeholders in the research process.

Barriers to Inclusion

Data show that NIH-funded research is indeed including women and other population groups, no doubt attributable to some degree by the strengthened NIH policies of inclusion [13]. The most recent aggregate data available (FY2002) on

all NIH-funded research indicate that almost 69 percent (6 238 525) of extramural clinical research participants are women, and 31 percent (2 855 387) are men [14]. When sex-specific studies are eliminated from the data, the participation of women and men in clinical studies is proportional to the general population (51 percent women and 48 percent men).

Nevertheless, challenges continue to confront the recruitment and retention of women, minorities, and other traditionally under-represented individuals in clinical research. The *Outreach Notebook* summarizes a few of these: fear and distrust of the research enterprise; lack of information provided to potential participants (especially related to informed consent); lack of transportation to clinical research facilities (especially for rural areas, areas affected by harsh weather, or those with limited financial resources); interference with work or family responsibilities or both (especially for women or men who have family care or demanding work schedules); burden of repeated clinical tests and trips to clinical research sites; and financial costs (either unpaid research costs or time away from work) that may be prohibitive for low-income individuals.

Far from simply pointing out obstacles, however, the *Outreach Notebook* also describes basic attempts to help meet the goal of inclusion. Researchers should try to understand the study population's cultural norms and beliefs and then establish an explicit outreach plan that involves community and institutional communication channels. They should plan for a collaborative evaluation that includes community leaders and potential participants in recruiting study participants; and they ought to let the participants know they're important by communicating research progress and findings to them.

A report titled *Science Meets Reality: Recruitment and Retention of Women in Clinical Studies, and the Critical Role of Relevance* provides additional guidance for those interested in implementing these strategies [15].

Remaining Challenges

There has been a steady progression from the ethics of protectionism to the ethics of inclusion and a notion of justice in clinical research. Inclusion, however, cannot trump all other ethical concerns. This is especially important given a historical context tarnished by the blurring of clinical care and clinical research in vulnerable populations. Necessary incentives must not become problematic lures, whether they be reimbursement for time, training, or the promise of continuation of health care after the study is over. The fact that, during research, many underserved populations will have experienced the best (if not the only) health care that they have ever received makes this determination difficult, but not impossible. Clarification of such issues between researchers and potential study participant communities is a must.

Not all remaining challenges involve researchers and study participants or their communities alone. For example, 1 remaining challenge is to encourage editors, reviewers, and authors of peer-reviewed publications to include analyses of the differences or similarities between men and women or population subgroups differing by race or ethnicity, poverty, geography, or other factors that may influence health outcomes. When included, these analyses become available as part of the "base" for evidence-based medicine [16].

The intent of efforts for representative inclusion in clinical research is to provide science-based initiatives that can utilize biomedical and behavioral research to eliminate gaps in knowledge and to address inequities in the prevention, detection, and treatment of illnesses among women and men of varied races, cultures, ages, communities, and means. There remains a need for similar diversity among the scientists who design, conduct, and interpret research studies and those who are responsible for incorporating the results into evidence-based clinical practice and public health policies. Balance must exist between good science and the reality of ethical and pragmatic challenges facing researchers in order for us to realize the potential of biomedical research for achieving equity in health care and health outcomes. The fulcrum of that balance must be input from and collaboration with the potential study participants and the communities in which the studies are implemented.

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Routine Prenatal HIV Testing as a Standard of Care

There are various clinical and ethical arguments against the concept of implied consent for prenatal HIV testing.

Getahun Aynalem, MD, MPH, Peter Kerndt, MD, MPH, and Kellie Hawkins, MPH

The requirements of pretest counseling and written informed consent are barriers to prenatal HIV testing in the United States, an Institute of Medicine (IOM) panel concluded in 1999. Therefore, the panel recommended that these requirements be eliminated and that prenatal HIV testing become a routine and universal part of prenatal care while still protecting the right of a woman to refuse testing if she chooses not to be tested, ie, "opts out" [1]. The American Medical Association, the American Academy of Pediatrics, and the American College of Obstetricians and Gynecologists have endorsed the IOM's recommendations [2]. In 2001, the US Public Health Service (USPHS) issued revised guidelines for prenatal HIV testing that stopped short of the IOM recommendations [3]. The Public Health Service advised health care providers to recommend HIV testing to all of their pregnant patients but embraced the requirement for specific written informed consent required by many states. The Health Service also noted, however, that if written consent is deemed a barrier and if state law permits, verbal consent may be enough to perform the test [3].

Following widespread implementation of the USPHS guidelines, the number of HIV tests conducted in prenatal clinics in the United States has risen dramatically, resulting in a sharp decline in the number of perinatally acquired HIV infections [4]. Despite the declines, cases of perinatal HIV transmission continue to occur, largely because of missed opportunities for HIV testing during pregnancy. The estimated 280-370 infants born with HIV infection each year represent populations in which prevention efforts are impeded by lack of timely HIV testing and treatment of pregnant women [5]. These continued infections and changes in public attitude about HIV disease, along with the technological advances in the treatment of the infection, underscore the need for improved strategies that ensure testing of all pregnant women and, if results are positive, treatment to safeguard their health and the health of their infants.

Past controversy about HIV screening of pregnant women has been less related to its scientific aspects than to the social, ethical, and political implications of testing and occurred at the time when no effective preventives were known. In other words, the case of prenatal HIV testing provides a clear example of how nonscientific concerns can trump (whether rightly or wrongly) an otherwise widely accepted, evidence-based strategy. Individuals infected with HIV have often been subjected to prejudice and discrimination, especially early in the epidemic. The high potential for such discriminatory effects was enough to separate HIV screening from other kinds of screening for maternal conditions, such as tests for Rh factor, blood count, glucose levels, rubella immunity, hepatitis B, syphilis, chlamydia, and gonorrhea. Rigid legal requirements for informed consent specific to prenatal HIV testing exist in some states, may require patient notification of the right to refuse testing, and hinder the implementation of universal testing as a routine component of prenatal care [2]. Nonetheless, it has been suggested that mandatory testing for HIV in pregnant women is rational, just as is screening for syphilis. This is in part because the potential harm to the infant is so great (essentially life-or-death) [6], particularly when compared to the relative ease with which treatment of the mother can prevent perinatal HIV transmission.

Mandatory prenatal HIV testing, however, may have negative consequences of its own. First, under mandatory testing, some pregnant women may not seek prenatal care due to a variety of concerns related to testing HIV-positive. Such concerns include the fear of personal illness or death; the fear of losing relationships, jobs, or both; fear of domestic

violence [7]; and the fear of financial hardships and stigma that some HIV-positive persons face [8]. Therefore, mandatory testing may reduce the number of pregnant women who seek prenatal care, especially those in high-risk populations [9]. Second, mandatory testing violates patient autonomy, the right to bodily integrity, and the right to make medical decisions about one's care and treatment. It may place individual rights of adults at odds with the state's duty to protect the health and safety of children. Finally, studies have also shown that, given the high levels of acceptance of voluntary HIV testing in the United States, the benefits of mandatory testing are minimal [10]. Therefore, with good reason, a strategy of routine counseling and voluntary testing with the right of refusal has been widely recommended over mandatory testing programs.

Under the "routine counseling and voluntary testing with the right of refusal" strategy, providers of prenatal services can offer HIV testing to all pregnant women under their care. Women have the option to refuse the test if they wish. This strategy can be accomplished in at least 3 ways.

- The first and most widely accepted method is to provide HIV testing only after the woman has been consulted and her informed consent obtained.
- The second method recommends that patients be informed about the provider's intent to perform an HIV test, and only if the woman signs a form refusing the test ("the right of refusal") is the test withheld.
- Lastly, consent of HIV testing may be considered *implied* by a woman's general consent to supply a blood sample for prenatal testing. This method of presumed consent is used in testing for hepatitis B, syphilis, chlamydia, and gonorrhea. Women who seek prenatal care are assumed to consent to routine testing and are not asked for specific verbal or written consent to testing for these diseases.

Studies indicate that all methods of this strategy are cost-effective [11], acceptable to pregnant women [12], and can achieve the benefits of prenatal HIV screening without violating women's civil liberties [13].

Yet, up to 10 percent of pregnant women may not consent to prenatal HIV-testing [14,15]. If true, this finding limits the utility of the first 2 methods. Some of the reasons why pregnant women refuse testing include:

- the fear of being stigmatized as sexually promiscuous or as an injection drug user;
- denial about the possibility of being infected;
- fatalism about life;
- fear of rejection leading to loss of emotional and financial support;
- lack of self-perceived risk for HIV infection;
- prior negative HIV test results;
- and lack of spouse approval [14-19].

In our experience in Los Angeles County, 8 percent of pregnant women interviewed refused HIV-testing. Of these, 74 percent were foreign-born, and the most common reasons for refusal were that they had been tested previously (44.6 percent) or were in a monogamous relationship (35.4 percent). Therefore, under the first 2 methods of implementing voluntary testing, some HIV positive women may choose not to be tested. As a result, these women would not receive the treatment and service they need to combat the disease and protect their babies and others against HIV infection. The opportunity to treat the mother early and prevent mother-to-infant transmission will be missed.

The third method—implied consent—has some notable advantages over the previous 2. If consent for HIV testing can be considered *implied* by a woman's general consent to supply a blood sample for prenatal testing and HIV testing is incorporated into the standard battery of prenatal tests, more pregnant women will be tested for HIV. Importantly, at the same time that testing becomes more widespread, the stigma of HIV testing may diminish by elimination of any targeted testing based on appearance, socioeconomic status, and race or ethnicity. For a pregnant woman who was not screened for HIV due to lack of prenatal care, rapid tests during labor and delivery or postpartum should be considered as part of standard obstetrics care to further reduce perinatal HIV transmission.

So, to minimize mother-to-infant HIV transmission and address the social, ethical, and political implications of HIV testing during pregnancy, has the time arrived for health care providers, policy makers, and civil rights advocates to revisit the notion that consent for HIV testing may be considered *implied* by a woman's general consent to supply a blood sample for prenatal testing? Incorporating HIV testing into the standard battery of prenatal tests provides a

rational way to implement a sound, evidence-based strategy while addressing some of the critical social and ethical issues surrounding HIV testing.

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Op-Ed

Does Evidence-Based Medicine Offer Fair Benefits for All?

Evidence-based medicine has the potential to offer objectivity and standardized practices into an often subjective decision-making process.

Wendy Rogers, PhD, FRCAGP

Evidence-based medicine (EBM) has the potential to introduce rational order into the sometimes subjective processes of deciding which treatments to fund (at a policy level) and which treatments to use (at a clinical level). Both of these decisions raise questions of justice: how do we allocate health care budgets fairly, and how do we make sure individual patients receive an equitable share of the benefits? Part of the appeal of EBM lies in its perceived fairness. EBM seems to offer the promise of consistent and impartial evidence about the benefits and harms of treatments due to the transparent use of high quality primary research in systematic reviews and meta-analyses. These results are then applied in equally transparent processes to make clinical decisions. Justice in providing health care is critically important, since equity in this area may go some way toward redressing health inequalities, which are inescapably linked to socioeconomic and other disadvantages both within and between countries. This article first reviews the justice claims of EBM and then suggests challenges, both to the evidence base itself and the mechanisms used to generate and apply it.

Justice

We can think about justice in at least 2 ways: distributive and procedural. *Distributive* justice is concerned with the allocation of material goods, with the focus on outcome patterns. Several criteria can be used to determine who is entitled to the goods in question, such as need, capacity to benefit, merit, or rights [1]. The use of EBM in guiding both resource allocation and clinical decisions has at least something to do with the fair distribution of services and treatments. The criterion that EBM relies most upon is capacity to benefit, measured by clinical markers of effectiveness. A policy that mandates an EBM-proven treatment can ensure that all patients have equal access to the treatment irrespective of, for example, their geographical location or specific health care provider. A clinical guideline advising use of the same treatment may ensure that it is offered to all patients irrespective of any personal preferences or biases of their treating physician. Taken together, the end result should be the fair distribution of the treatment to all those with equal capacity to benefit.

Procedural justice concerns making and implementing decisions using fair processes. The fairness of processes is usually judged against criteria including consistency, impartiality, transparency, and the representation of all parties affected by the processes in question [2]. The processes of EBM make some claims to fairness in that there are predetermined and agreed-upon rules for including or excluding research in reviews, for judging whether or not a treatment is effective, and for membership in guidelines groups.

EBM and Justice

These prima facie claims about EBM and justice can be challenged in a number of ways. With regard to the distribution of effective treatments, national policies in some countries have ensured that EBM-proven treatments are

guaranteed nationwide, but these same policies have not been supported with matching funding. This means that fair access to new treatments comes at a cost to existing interventions, leading to a new set of inequities as established programs are cut back to facilitate the introduction of EBM-proven treatments [3]. EBM relies upon the criterion of capacity to benefit, but this takes no account of the seriousness of the ailment for which there is evidence of an effective cure. Patients who have high levels of need and illnesses for which there is little or no evidence about effective treatments may lose out to those with better-researched diseases. Distribution according to capacity to benefit takes no account of existing patterns of ill health or of medical need, making it a suboptimal way of developing coherent policy to address health inequities at a population level.

As far as eliminating discrimination at the level of individual patients, to date the record is mixed. One study has, for example, shown that EBM guidelines have improved access to renal dialysis for African Americans [4], but in other areas of medicine, biases remain. Women, the elderly, and African Americans remain undertreated for cardiovascular disease, despite the large evidence base in this discipline [5,6].

These points about distributive justice are hard to prove; to do so requires complex empirical data, much of which is currently unavailable. We do, however, have enough information to enable us to be on our guard against these potential injustices. We can monitor the effects of policies to introduce new EBM-justified interventions, keep track of the changes in patterns of expenditure, and take note of how these changes affect services to disadvantaged groups. We can examine the match between major causes of morbidity and mortality, and the development of effective treatments. We can track equity in the application of EBM-justified interventions through audits that document the recipients of new interventions, and thereby ensure that the benefits are not limited to the more privileged subgroups of the population.

The concerns relating to procedural justice are more complex. The scientific ideals of consistency and impartiality presuppose a certain sameness between all research participants and potential patients, so that in theory anyone with the relevant condition is eligible to participate in a clinical trial or act as a consumer adviser on a guidelines group or to a research team. These assumptions do not sit easily with justice requirements to treat those in like circumstances equally and those in unlike circumstances differently. Impartial procedures allow equal formal opportunities but do not lead to impartial outcomes when there are significant differences of power and resources amongst the populations in question [7]. Institutions, such as hospitals and universities, do not overtly or intentionally discriminate against disadvantaged or minority groups in their research, but the research they perform effectively excludes these groups by its very processes and requirements [8].

There is ongoing evidence demonstrating the homogeneity of research populations despite the need for research evidence that applies to the poor, the elderly, those with multiple pathologies, and other underserved groups [9]. In order to address these concerns, we need research processes that overtly acknowledge the current inequities in research participation. A first step would be to require researchers to redesign research, removing the current barriers to participation by those who are disadvantaged. A second step would be to increase the number of opportunities for participation, either by increasing heterogeneity in general research populations or by specifically funding research with disadvantaged subgroups.

Participation in research is, however, only one area in which disadvantaged groups are excluded from the processes of EBM. Their voices are also absent in setting the research agenda and in serving on the groups that work to translate evidence into clinical guidelines. This latter process requires exercise of values and judgment as well as evidence [10]. The group has to make decisions, for example, about what counts as a rare complication or how many treatment choices patients should be offered. Exclusion from this part of the process can result in a set of evidence-based treatment guidelines that takes no account of disadvantaged patients' capacity to afford or cooperate with treatment regimes.

Equity in Health Care

So far, these claims about EBM and justice are relatively inward-looking, inasmuch as they have been concerned only with the fairness of EBM itself rather than with the wider subject of equity in health care. Given, however, the currently influential role of EBM in contemporary health care, we may legitimately question its effect upon the bigger

picture. One crucial factor relates to the funding of research. Research evidence is necessary for the processes of EBM, and, increasingly, EBM review is necessary for funding of new interventions. This leads to a cycle in which the more research that exists about a particular health problem, the more likely it is that further research will be funded to investigate it.

If we used an open, transparent, and consultative method of setting priorities, we would not necessarily get the current distribution of research funding. This is due in part to the sources of health research funding. At present, the biggest single source of research funds—the pharmaceutical industry—creates a demand for research that is likely to lead to profitable products rather than to a minimization of the inequitable effects of ill health. Our challenge is to devise processes that include the interests of all citizens in determining and implementing research agendas [11].

EBM is a tool for improving health care; how we use this tool is up to us. EBM can provide powerful reasons for governments and health care providers to supply effective treatments, but unless we address the ways that disadvantaged people are excluded from the processes and benefits of EBM, it is just one more factor contributing to entrenched inequalities in health and health care.

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The Origins and Promise of Medical Standards Of Care*

Standards of care in medicine have gone through many changes and developments over the course of its history.

Eleanor D. Kinney, JD, MPH

In a 1990 report on medical standards of care, the Institute of Medicine established a taxonomy of standards that remains relevant today [3]. According to this taxonomy, the following types of medical standards are used currently in the United States:

Standards of quality: statements of the minimum acceptable level of performance or results, what constitutes excellent performance or results, and the range in between.

Medical (or clinical) practice guidelines: systematically developed statements to assist practitioners in their decision making in specific clinical settings.

Medical review criteria: statements used to assess the appropriateness of specific decisions, services, and outcomes in the delivery of health care.

Performance measures: specific measures of a quantitative nature that estimate or monitor compliance with medical quality standards, medical practice guidelines, and medical review criteria by health care professionals.

"Standards of care" should not be thought of as a single, uniform whole. Rather, the appreciation of the different types and their different functions facilitates more thoughtful discussion and may even reduce apparent conceptual disagreement.

Standards from Within: The Medical Profession and Its Specialties and Societies

Medical specialists and their learned societies have been the major engine for the development of medical standards of care. After World War II, large-scale funding of biomedical research in academic medical centers and expanded third-party payment greatly enhanced the power and prestige of medical specialties. Medical specialties concomitantly became interested in the quality of clinical practice. In particular, the specialties wanted to maintain control over the definition of the quality and content of medical care. Of note, during this same period, medical specialists became more willing to testify for plaintiffs in medical malpractice cases, making medical liability an important phenomenon in American medicine.

The development of medical standards of care took off in the 1980s. Medical professional associations, specialty societies, and voluntary health organizations became involved in developing standards of care in an increasingly rigorous fashion. By the late 1980s, the American Medical Association, working with medical specialty societies, launched a major initiative that signaled the endorsement of medical standard-setting by the organized medical profession [4]. In 1987, the American Council of Medical Specialty Societies announced that the American medical profession and American medical specialty societies should participate more in standard setting [5].

Standards from Without: Third-Party Payers and Health Services Research

In part, the medical profession was responding to pressures from third-party payers, who looked to standards to reduce unnecessary health care services. In 1981, the American College of Physicians and the Blue Cross and Blue Shield Association launched the Clinical Efficacy Assessment Project to evaluate use of specific medical procedures and technologies [6,7]. By the late 1980s, the Health Care Financing Administration (HCFA), which administered the Medicare and Medicaid programs, was using medical standards of care to develop both national coverage policy and medical review criteria for its programs [8].

Health services research, financed primarily by the federal government and conducted chiefly in academic medical centers, has played a crucial role in the evolution of medical standards of care. Specifically, professionals in the field of health services research, which began in the 1960s, took on the study of the cost, quality, and accessibility of health care services using economic and other social science research methodologies. Much of this research focused on improving the quality of ever-more-expensive health care. Health services research identified wide geographic variations in medical practice and this, in particular, provided powerful evidence of the need for medical standards of care.

Health services researchers also adopted new theories of quality management, extolling the principles of Total Quality Management (TQM) and Continuous Quality Improvement (CQI), concepts they imported from industry and adapted to health care settings [9]. These quality principles strive to reduce variation in the production process through work standardization and continuous improvements in outcomes rather than on identification and elimination of defects in production. Many health care professionals and health plans adopted these principles, as did the Joint Commission on Accreditation of Healthcare Organizations and other accrediting bodies.

Further, the adoption of computerized patient record enabled a dramatic change in how medical standards of care could be used in the delivery of clinical care. This development also facilitated use of TQM and CQI in quality assessment and improvement—strategies that must have supportive performance data to be effective. Such data can best be collected through computerized medical records.

The movement toward integrated systems for delivery of care and managed care plans also fueled the development and use of medical standards. Medical standards became a critical tool for comparing managed care plans in a competitive environment—a phenomenon consistent with the best of managed competition theory, which emphasizes state-of-the-art quality measurement as a primary strategy for comparing competing health plans.

Having learned from experiences in the 1990s, when restrictions on access and preferences alienated health care consumers, sponsors of managed care plans now rely increasingly on medical standards of care to determine appropriate and cost-effective care. Only by applying medical standards of care and evidenced-based medicine can inappropriate care be identified in a manner that is credible to physicians and patients.

Finally, federal agencies have played a critical role in the development of medical standards of care. Specifically, the National Institutes of Health and the Veterans Administration fund research that has supported medical standards empirically (ie, provided its "evidence base"). Since 1989, Congress has maintained an agency within the Department of Health and Human Services that has direct responsibility for the promotion and management of medical standards of care. Today, the Agency for Healthcare Research and Quality (AHRQ) funds and promotes the health services research that supports these standards and convenes experts to facilitate their development. More recently, this agency has had a leadership role in addressing patient safety issues that rely heavily on medical standards for resolution [10].

In sum, medical standards of care are here to stay as an important part of American medicine. Although many physicians decry the advent of standards as "cookbook" medicine, other physicians maintain that standard-setting is necessary for high quality medical care. There is now little debate about their validity and importance for the delivery of high quality medical care. The American health care sector has indeed moved from a paradigm of autonomous professional decision making to a paradigm of collective decision making based on empirically derived standards of care.

With this move, however, come increasingly difficult questions. Medical standards now come from a multitude of sources. How do these sources derive their authority? Are the processes used in setting standards open, transparent, and designed in a way to marshal the best information to guide clinical practice? Should standards from "within" the profession agree with standards from "without"—from the business office, for example—particularly when external standards have cost containment as the end being pursued rather than a patient's individual interest? How can differing standards from different sources be reconciled? While pluralism in the development of standards may be desirable and consistent with our cultural value that competition is important, such pluralism—an outcome of the historical development of medical standards of care—poses challenges today for the medical profession and the patients it serves.

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