

What Is a Good Decision?

When I was asked to think about how patients make decisions and how we as health care providers assess these decisions, a recent encounter came to mind. A 36-year-old woman came into my office requesting a complete physical examination, "screening labs," a mammogram, and a Thin-Prep Papanicolaou (Pap) smear. She had read about Thin-Prep Pap smears in a women's magazine and wanted me to use this method to ensure that we were "not missing anything." Explaining her concern, she mentioned that her 76-year-old mother had recently died of "cancer all over her body" (which began in her breast) and that before dying her mother had a standard Pap smear that did not show any cancer.

I was glad she came in for a physical examination and was encouraged by her interest in prevention. I questioned, however, the value of a mammogram for her, given her family history (one first-degree relative who developed the disease in her mid-70s) and the limited sensitivity of the test in younger women. I appreciated her fear of missing cervical cancer because of an ineffective test. However, I also felt that her distrust of the standard Pap smear (because it did not detect her mother's cancer in an unrelated organ) was unwarranted and should be addressed.

As we talked, I learned that she felt generally well and had no significant medical history. She had divorced an abusive husband and was now happily dating another man and using Depo-Provera shots for birth control. Her last tetanus booster was "years ago." For the past 20 years, she had smoked two packs of cigarettes per day (and did not plan to quit); she also drank a six-pack of beer each night to improve her mood and help her sleep.

I was struck by the paradox. This young woman seemed more concerned about screening for cancer than about her smoking and drinking—behaviors more likely to adversely affect her health. It seemed to me that changing these behaviors was the most relevant preventive issue.

We talked about the sensitivity of Pap smears, her risk for breast cancer, and the questionable value of screening mammography for a woman in her 30s. I then emphasized the risks associated with tobacco use, substantial alcohol intake, and intercourse without barrier contraception. I offered her a tetanus booster.

At the end of our conversation, she thanked me for all of the time I took with her, reaffirmed her desire for a Thin-Prep Pap smear and mammogram, explained that she was not ready to give up tobacco or beer (the idea made her anxious), and said that she did not want a tetanus shot now but would rather wait until she cut herself.

Were these good decisions? Had I failed to communicate the correct information? Patients make decisions on the basis of accumulated facts and emotions. Facts can be slippery and subject to individual bias and distortions. Patients may compile statistics, lists of risks and benefits, and case reports of similar situations in search of the right decision. Fear (of knowing or not knowing) and recent losses or gains (last-case bias) clearly play a powerful role in the decision-making process.

But what constitutes a good decision? The decision must be informed, and ideally the patient has gathered facts from various sources. A discussion with a trusted health care provider that includes some combination of quantitative and qualitative data, depending on the cognitive strengths of the patient, should then ensue. The patient should have some sense of the pros and cons of the decision in question, alternate options, and the ramifications of not choosing. Finally, it is helpful if the patient

SHORT ESSAYS

AMANDA RATLIFF, MD

*Internal Medicine Resident
Dartmouth–Hitchcock Medical Center*

MARCIAN ANGELL, MD

*Executive Editor
New England Journal of Medicine*

RICHARD W. DOW, MD

*Chairman of Surgery
Dartmouth–Hitchcock Medical Center*

MIRIAM KUPPERMANN, PhD, MPH

*University Professor
University of California*

ROBERT F. NEASE, Jr, PhD

*Decision Analyst
Washington University*

ROGER FISHER

*Director
Harvard Negotiation Project*

ELLIOTT S. FISHER, MD, MPH

*Associate Professor of Medicine
Dartmouth Medical School*

DONALD A. REDELMEIER, MD, MSHSR

*MARIE E. FAUGHNAN, BSc, MD
Medical Decision Scientists
University of Toronto*

BARBARA K. RIMER, DrPH

Director, NCI Division of Cancer Control and Population Sciences

SUSAN P. PAUKER, MD

*Medical Geneticist
Harvard Medical School*

STEPHEN G. PAUKER, MD

*Decision Analyst
Tufts University School of Medicine*

HAROLD C. SOX, MD

U.S. Preventive Services Task Force

Effective Clinical Practice.

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has some degree of self-knowledge, allowing her to know the level of risk with which she is comfortable.

In the case of the young woman whose story I have told, her decisions emanated from personal loss (her mother's recent death), some fact-finding (the women's magazine), and presumably some degree of knowledge about which risks she was willing to take. My charge was to enhance her understanding of the issues, offer

her more facts, hear her concerns, and then let her make the decisions that would be good ones for her.

AMANDA RATLIFF, MD

Internal Medicine Resident

*Dartmouth-Hitchcock Medical Center
Lebanon, NH*

Any important medical decision has two distinct components. The first component consists of technical judgments, which are the answers to such questions as "What is the diagnosis? What is the most effective treatment? What are the likely consequences of the treatment?" The second component consists of value judgments, which are the answers to such questions as "Do I want to know the diagnosis if the outcome will not change much? What is my tolerance for a false-positive result on this test? Will the quality of my life be better with a less effective treatment?"

In my view, many bad decisions result from a confusion of these two components and from not appreciating who is the best decision maker for each. Technical judgments need to be made by experts, not by patients. Physicians are trained to know how to establish a diagnosis; patients are not. Physicians abdicate their responsibility when they invite patients to make technical decisions. Yet some physicians believe that respect for patient autonomy requires them to share all aspects of decision making with their patients. Sharing responsibility for technical decisions results in bad decisions.

On the other hand, the value judgments that are so much a part of important medical decisions can be made only by patients. Physicians should limit their role in these judgments to advising. Sometimes patients' value judgments may seem eccentric or even wrong to their physicians. For example, some patients have refused to have a gangrenous limb amputated, preferring to risk death. In less dramatic instances, patients may refuse recommended procedures because they did not think the procedures were worth the discomfort or risks. As long as the risks and benefits have been clearly spelled out by physicians, patients should have the responsibility of weighing them against each other and deciding what to do. Only they can evaluate the likely effect on the quality of their lives. Bad decisions are probable when physicians attempt to usurp that aspect of the decision-making role from patients. I believe that such usurpation is more common than inappropriately sharing technical decisions with patients.

That is not to say that physicians should not offer their advice. Sometimes physicians refuse to do so in the mistaken notion that it would violate patient autonomy. Instead, they offer a menu of options in a neutral fashion and wait for the patient to choose one. That is leaning over backward too far, and sometimes, particularly when a patient is unusually assertive, it smacks of passive aggression. Physicians have usually seen many patients with problems similar to those of any particular patient, and because of this they are a valuable source of advice. For example, a physician could tell a claustrophobic patient who is reluctant to have magnetic resonance imaging that she has seen many such patients who did well after appropriate sedation (and maybe some who did not).

Sometimes patients ask their physicians what they would do if faced with the same decision. I believe it is important for physicians to answer that question honestly. Not only does it offer that patient a point of view that will probably be unusually informed, but it makes the physician more human and thereby strengthens the physician-patient relationship. It is not the same, however, as making the decision for the patient.

When physicians and patients are explicit about which component of a medical decision they are considering, good decisions are far more likely. What is a good decision? One that achieves the optimum improvement in health and peace of mind for the patient. Physicians should feel that they have done the best job they could, and patients should feel that the decision was the best they could have made.

Many sources of information now available to patients, including videos, Web sites, and pamphlets, can aid decision making. However, these sources should not be a substitute for conversations with physicians. Physicians should take the time to review informational material with their patients and engage in a dialogue that can get to the heart of their patients' uncertainties and concerns. It would be a pity if the new decision-making tools served as an excuse for physicians to avoid a crucial part of their responsibilities. I do

not believe that good decisions can be routinely made by patients sitting alone at their computers or videocassette recorders. Physicians need to take an active part in the process.

MARCIANGELL, MD*Executive Editor*

New England Journal of Medicine
Boston, Mass

Millions of medical decisions are made every day in the United States, and the extent to which patients may participate in them varies. Some decisions are made autonomously by patients, such as the decision to discontinue a medication because of side effects. Other decisions are made autonomously by health care professionals, such as an intraoperative decision about the exact limits of excision of a malignant neoplasm. Between these extremes are all of the occasions in which the health care professional and the patient engage in a dialogue leading to a decision. These individual decisions collectively determine the nature and quality of our medical care. Consequently, it is important to consider the conditions that must be satisfied in order to characterize a decision as being "good."

First, good decisions should be well informed. The uninformed selection of an option that has a good outcome is luck, not a good decision. For the typical patient, the task of becoming well informed about his or her medical choices is a formidable challenge. A broad spectrum of topics—the efficacy of a health maintenance strategy, the natural history of an untreated condition, the relative efficacy of competing treatment strategies, the comparative cost of alternative choices, and the risk–benefit ratio of the options—must be researched and mastered. The task of remaining well informed is also challenging for the health care professional because the pace of change, development, and discovery is rapid and accelerating. I am hopeful that enhanced access to timely and accurate medical information (such as is occurring on the Internet) will assist all parties. Nevertheless, physicians must retain a

clear sense of responsibility for ensuring that individual patients are appropriately educated and fully informed about their choices.

Second, good decisions should be compatible with the values of the patient. Medically sound strategies that are not compatible with the patient's values are not acceptable options. Although physicians confront difficult value-sensitive medical decisions daily, patients usually have less experience with serious choices. To make a decision that is fully compatible with their own values, patients need help and time to assimilate the realities of the choice and to consider what their values are.

Finally, good decisions should be "workable" or "practical." Specific elements—such as affordability, efficacy, complexity, availability of appropriate support systems, geography, transportation, and many other factors—affect this aspect of the decision-making process. Of course, each of these elements must be considered in the context of the individual patient's special circumstances.

In summary, I see three essential characteristics as defining a good decision. Decisions should be well informed, compatible with patient values, and practical. Although well-formulated questions in patient surveys may be able to measure these characteristics, a strategy to ensure that the three conditions are met seems more elusive.

RICHARD W. DOW, MD*Chairman, Department of Surgery*

*Dartmouth–Hitchcock Medical Center
Lebanon, NH*

Most interesting health care decisions involve uncertainty. Consider the quandary posed by prenatal diagnostic testing for chromosomal disorders. A 40-year-old woman who has been trying for years to get pregnant has at last succeeded. She wants to have a child, yet she feels strongly that she does not want to have a child with Down syndrome. She now faces a choice between two risky options: undergoing prenatal diagnosis and incurring a 0.5% above-background risk for mis-

carriage to minimize her risk for having a child with Down syndrome, or forgoing prenatal diagnosis and living with a 10% risk for giving birth to a child with Down syndrome.

Uncertainty in health care decision making poses a fundamental problem in evaluating the quality of a decision made based on the desirability of the outcome. For any single decision, there is a chance that a bad outcome will result, regardless of the quality of the deci-

sion-making process. After deliberation and consideration, the patient in our example could reasonably choose to forgo prenatal testing; that alternative maximizes the chance of attaining the outcome that matters most to her. Even if her decision is "good," she may give birth to an infant with Down syndrome. Similarly, another patient could flip a coin to decide which option to pursue and end up having an unaffected baby. Thus, for a single decision, it is difficult, if not impossible, to determine the quality of the decision solely by judging the desirability of the outcome.

Although we cannot know whether any single decision is "good," we can gain insight into whether a decision-making process (or an intervention to improve decision making) is better than other competing processes. We believe that there are three hallmarks of a good decision-making process.

An Appropriately Informed Patient

Good decision making requires an appropriately informed patient. A patient must be informed about the relevant upsides and downsides of any choice he or she might make. Because patient-centered approaches for clinical decision making are new, it is important to inform the patient not only of the nature of the relevant interventions but also of the role of individual preference in decision making. A well-designed process for helping our hypothetical patient make a decision about prenatal testing should communicate the importance of individual preference as well as the risks and benefits of amniocentesis, chorionic villus sampling, and no testing.

It is rarely possible, however, to present complete information about a disease or intervention. In other words, some information must be excluded from the decision-making process. A useful standard to help decide what information to present is the rule of nondeception. After being fully informed about the decision at hand and the constraints imposed by clinical decision making, would a reasonable patient feel deceived by the information presented? Excluding information about the risk for procedure-related miscarriage when discussing chorionic villus sampling, for example, would fail the rule of non-deception. Assessment of this aspect of decision making could entail measuring the patient's awareness of what the possible outcomes of her decision are, how likely they are to occur, and how her individual preferences should play a role in the decision-making process.

Satisfaction with the Decision-Making Process

Assessment of satisfaction with the process of decision making is less straightforward. In theory, a more

informed patient should be more satisfied with the decision-making process. Several good measures have been developed to assess whether patients feel that they have received sufficient information and support in making their decisions. Underlying this construct is an implicit assumption: The patient who is more informed experiences less decisional conflict and therefore is more satisfied with the process. For some patients, however, more information engenders increased anxiety and conflict about the decision. In the example, the first woman could feel much more encumbered by the decision-making process than her coin-flipping counterpart. Part of the art of evaluating decision making, therefore, is balancing the desire for information with the quantity of information given.

Satisfaction with the Outcome

Satisfaction with outcome may be what matters most to patients. In the prenatal testing scenario, the first woman is unlikely to be delighted with her outcome if she gives birth to an infant with the Down syndrome. A good process may increase her satisfaction with the outcome in two ways. First, although less-preferred outcomes will occur in individual cases, we should expect, on average, that a good decision-making process will produce outcomes with which patients are more satisfied. Second, a good decision-making process may help patients understand and accept the possibility that good decisions may produce bad outcomes. This realization may increase patient satisfaction, even with undesired outcomes.

Regardless of the complexity of a decision, three fundamental requirements of good decision making are frequently absent from health care as it is currently delivered: adequacy of information, satisfaction with the decision-making process, and satisfaction with the outcome. These aspects are prerequisites to good decision making and are the first order of business in improving decision-making quality.

MIRIAM KUPPERMANN, PhD, MPH

Assistant Professor

*University of California
San Francisco, Calif*

ROBERT F. NEASE, Jr, PhD

Associate Professor

*Washington University School of Medicine
St. Louis, Mo*

Medical decisions are different from other decisions in several important ways. Gaps in knowledge and authority between physician and patient can be profound. A wise decision requires the participation of both parties. Although a given decision may appear trivial, the stakes can be high. Chance also plays a major role: The wisest decision may, against the odds, lead to a patient's death; a careless decision may have a wonderful outcome.

The wisdom of a medical decision, therefore, cannot be judged by its outcome. It must be judged by the care and attention that produced it—by the quality of the process used by the physician, the patient, and others to negotiate their differences and reach a final decision.¹ This negotiation should not only bridge the gap between provider and patient but also overcome common problems that lead to poor decisions (Table 1).

Lack of clarity in the roles and responsibilities of the patient, family members, and physician may impair decision making. A patient who expects to be engaged in each important choice may be furious at the physician who routinely orders a screening prostate-specific antigen test. The patient who prefers a less active role in decision making may legitimately wish to have his or her preferences taken into account. Regardless of their preferred role in reaching the final decision,^{2,3} all of those involved thus have an important contribution to the process. The patient's perspective is paramount in judging how symptoms and possible complications of treatment will affect the quality of his or her life.^{4,5} The clinician has special knowledge of treatment options, possible outcomes, and their probabilities. Family members may have important information not only about the social and economic implications of a choice but also about the patient's perceptions and concerns about a problem. Clarifying roles and responsibilities at the outset can reduce the risk for misunderstanding.

Regardless of what roles are adopted, wise decision making requires information from both the physician and the patient. Inadequate scientific data on the possible outcomes of tests and treatments pose a well-recognized barrier to decision making.^{6,7} That barrier is best overcome through further research. Physicians should bring to the table the current scientific evidence (and the uncertainties that surround it). Also on the table should be the patient's concerns, values, and assumptions.^{8,9} Cultural and religious beliefs, attitudes toward risk and outcomes, and financial and social support differ dramatically among patients and should be taken into account.

Only when the available evidence and patient attitudes are understood can the physician and patient adequately explore the options that may address both clinical and nonclinical concerns. The traditional approach is for the clinician to develop a single recommendation

TABLE 1
How Can Physicians and Patients Improve the Quality of Their Joint Decisions?
A Negotiating Checklist

POTENTIAL PROBLEM	HOW ARE WE DOING?
Relationships and roles are unclear	Have the roles and responsibilities of the physician, patient, and family been clearly defined?
Objective data are inadequate	Have sufficient data been obtained, including possible outcomes, their likelihood, and how they would affect the patient?
Values, interests, and assumptions are unexplored	Have all of the patient's interests and concerns been articulated? Have assumptions and expectations been adequately tested?
Too few options have been considered	Have a wide range of options been fully developed to address the patient's concerns? Have specific concerns been left unaddressed?
Alternatives to agreement are unclear	If an impasse is reached, does the patient have a clear path forward?
Communication is poor	Is patient-physician communication easy and open? Is adequate time being provided? Are risks well understood?
The decision is difficult to justify	Can the patient and physician each articulate a clear rationale for the proposed decision? Are both satisfied with the decision and the process (before knowing the outcome)?

and then ask the patient for approval. The quality of the final decision, however, is likely to be better if patients are engaged in the process of choosing among several good options that have been jointly developed.^{10,11}

But what if an impasse is reached and the options presented by the physician fail to meet the patient's fundamental concerns? In most negotiations, it is helpful to have a clearly articulated alternative to the negotiated agreement.¹ Patients and their families are likely to feel powerless in the face of a physician's refusal to consider their preferred approach, regardless of whether the decision involves the use of alternative medicine or the withdrawal of life support. Moreover, physicians and

patients rarely openly discuss the possibility that they will disagree fundamentally about the proper course of action, nor do they discuss how such disagreement might be handled. The “best” decision for a patient may well be to seek care from another provider. Recently developed guidelines on futile care are notable for their recommendation that a patient have a clear path to follow when agreement cannot be reached.¹² Confidence in the wisdom of a decision to proceed with treatment will be greater when both patient and physician are sure that the patient had a well-considered alternative to agreement with the physician’s final proposal.

None of these problems can be overcome without effective communication. Although a physician’s time appears increasingly scarce, time alone is not sufficient. Many physicians need to improve their skill in eliciting and sharing information. Effective means of communicating risks in ways that can be understood by patients are also needed.¹³

Any medical decision will probably have many positive and negative considerations. A patient’s ability to reach a satisfying decision is often best promoted if one line of reasoning can be articulated: “You could explain this decision to your family—and to yourself—like this: ‘I’ve studied the choices carefully. I’ve received the best advice I can get. I’m now convinced that going ahead is better for all of us than stewing around any longer.’” To the person who must decide (and to others), one good, well-articulated reason for making a particular decision will probably be far more persuasive than a carefully balanced list of a dozen cross-cutting considerations.

In the end, therefore, the quality of a medical decision may be judged not only by the care with which the decision is reached but also by how satisfied the patient, physician, and other affected parties are with both the decision-making process and the substance of the final decision. Because a good or bad outcome may powerfully influence perceptions, however, such a judgment is best assessed before the outcome is known.

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ROGER FISHER

Williston Professor of Law Emeritus
Director, Harvard Negotiation Project

Harvard Law School
Cambridge, Mass

ELLIOTT S. FISHER, MD, MPH

Professor of Medicine

Dartmouth Medical School
Hanover, NH

VA Outcomes Group
White River Junction, Vt

Cognitive psychology is the scientific discipline that examines how people reason, formulate judgments, and make decisions. The main observation is that people make mistakes when they encounter complex

problems. The striking finding is that even everyday situations are often complex enough to cause people to make mistakes. The fundamental assumption is that these mistakes are not random. Instead, the research

suggests that human reasoning is susceptible to systematic errors; that is, some mistakes are made repeatedly by most individuals. The intent of this essay is to review classic findings from cognitive psychology about judgment under uncertainty. An awareness of these pitfalls provides a method for identifying poor decisions and may facilitate better decisions in medical care. The classic findings from cognitive psychology follow in the text and are illustrated by using a medical example—the decision about whether to have a radical prostatectomy for prostate cancer—in Table 2.

Check Different Perspectives

One aspect of a good decision is that the interpretation of events should not depend on how things are displayed, a principle called frame resilience. Yet people commonly violate this principle, such as in a study where physicians were asked to consider surgery for a patient with lung cancer.¹ Some were shown outcome data expressed as survival statistics (e.g., 90% will survive), whereas others were shown the same data expres-

sed as mortality statistics (e.g., 10% will die). The main finding was that physicians were more likely to recommend surgery when shown survival rather than mortality statistics (75% vs. 58%, $P < 0.05$). This discrepancy violates standard tenets for consistency. One way to reduce this bias might be to view data deliberately from multiple perspectives before settling on a choice. With several perspectives, however, the final display may get preferential attention. One gains confidence only if alternate perspectives yield the same decision.

Draw on Strong and Stable Preferences

A good decision should be based on strong and reliable underlying preferences, a principle called procedure invariance. Research, however, shows that individuals sometimes have only a poor understanding of the magnitude of their preferences. In one study,² expert gamblers were asked to consider bets that had either a low chance of a big prize (e.g., bet A offers an 11% chance of winning \$40) or a high chance of a small prize (e.g., bet B offers an 89% chance of winning \$4). The majority

TABLE 2
Psychological Principles of Decision Making

PRINCIPLE	A BAD DECISION...	A GOOD DECISION...	EXAMPLES OF GOOD DECISIONS ABOUT WHETHER TO HAVE RADICAL PROSTATECTOMY
Frame resilience	Is affected by how information is displayed	Yields the same choice regardless of perspective	Patient A chooses surgery regardless of whether he is told "mortality is 1%" or "survival is 99%."
Procedure invariance	Seeks to address ill-considered preferences	Draws on strong and stable underlying preferences	Patient B decides to forgo surgery after thinking hard about the chance of incontinence—something he has always dreaded.
Context independence	Places a special emphasis or penalty on status quo	Considers a moderate number of options	Patient C chooses among three urologists at the local hospital rather than considering all urologists in the state or merely one.
Asset integration	Is overly influenced by recent events	Ignores gains and losses that balance out over time	Patient D does not change his mind about surgery just because his neighbor died during the procedure last week.
Hindsight fidelity	Edits away contradictory and ambiguous information	Honestly reflects past experiences and is unbiased by knowledge of outcome	Patient E chooses watchful waiting, even though he has heard a testimonial from someone that the operation "saved my life," because he knows this is only half the story.

indicated that bet A was more valuable than bet B, but when given the choice, few wanted bet A over bet B (67% vs. 29%, $P < 0.05$). Apparently, people do not always have clear underlying preferences that can be reliably consulted to resolve dilemmas. As a consequence, people may have difficulty deciding even when there is no doubt about the attributes of each alternative.

Avoid Excessive or Inadequate Options

A good decision should not place special attention on irrelevant alternatives, a principle called context independence. Sometimes, however, people give undue attention to available or unavailable alternatives. In one study, legislators were asked to make a judgment about closing a hospital.³ Some evaluated just one hospital, and others evaluated two hospitals. Paradoxically, legislators were more likely to choose not to close a hospital when faced with more potential candidates (64% vs. 26%; $P < 0.05$). In other words, the difficulty in deciding between two hospitals led some respondents, who otherwise would have supported closing a hospital, to avoid the decision and do nothing. This pattern of resorting to the status quo when facing difficult decisions can delay worthwhile advances. Conversely, offering too few options (i.e., just one alternative to the status quo) may expedite a decision at the expense of not fully considering the options.

Consider the Big Picture over the Long Term

Another ingredient of a good decision is focusing on final outcomes rather than recent changes, a principle called asset integration. In a study of college students,⁴ many were willing to take a risk (e.g., a 33% chance of losing \$15) rather than accept a small settlement, but few were willing to take the risk if they just incurred a small loss on an immediately preceding event (61% vs. 32%, $P < 0.05$). Such risk aversion tends to occur because choices are evaluated in isolation rather than in combination with long-term assets. Hence the irony that most people do not know their bank balance to the nearest \$20 but become intensely emotional when faced with a \$20 parking ticket. A set of decisions, like a portfolio of stocks, should not be evaluated at every small gain or loss.

Don't Oversimplify the Past

A final characteristic of a good decision is making use of what has been learned from past mistakes, a principle called hindsight fidelity. Nevertheless, people tend to retain only a distorted image when viewing events

retrospectively. In one study,⁵ anesthesiologists were asked to judge the quality of perioperative care by reading a patient's chart. Some were told that the patient ultimately had a small disability, whereas others were told of a moderate disability. Although the process of care was identical in both cases and the differences in outcomes was entirely related to chance, criticism was harsher for the more severe outcome. Such misleading judgments occur because retrospective evaluations overemphasize data that support the final outcome. In addition, conflicting or ambiguous data tend to be neglected when viewed with hindsight.

Conclusion

The jungle of medical decision making provides no path for safe travel. Cognitive psychology may spot a few malevolent beasts, but the full extent of danger is unknown. The discipline stresses the value of deliberation, a need to be cautious, some important principles, and the implausibility of finding fool-proof solutions. Inconsistent reasoning causes people to stumble—even healthy persons who have lots of time to think and face fairly simple choices. Medical decision making is likely to be even more arduous given that the terrain is strewn with deep emotion, long-term uncertainty, imperfect communication, and a glut of latent (and sometimes offsetting) errors. Fixing one error may allow others to run wild. These challenges argue for Stephen Leacock's somber recommendation that patients need to consult a doctor "who is lucky rather than skillful."

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DONALD A. REDELMEIER, MD, MSHSR

Associate Professor

MARIE E. FAUGHNAN, BSc, MD

Fellow

*University of Toronto and Sunnybrook Hospital
Toronto, Ontario, Canada*

A good decision may be hard to find, and good decisions may seem to elude us. But good decisions are not illusive. A good decision is one that is based on a process of informed decision making, with all the rich implications of that term. Patients have been told that they should make informed personal health decisions in a growing number of areas. This is especially the case when definitive evidence about the benefits of an intervention does not exist—for example, mammography for women in their 40s (until recently, depending on one's perspective) and prostate-specific antigen testing for men. Informed decisions are also necessary when the evidence has determined that two or more treatments are equal, such as treatment for early breast cancer.

What do we mean when we say that patients should make informed decisions? What are good decisions? We can extrapolate from the literature on informed consent for research procedures to include several dimensions.¹

For patients to be considered informed, they should understand the following:

What Is Being Offered and Why

If a patient chooses chemotherapy believing that it will cure rather than merely palliate, the decision may or may not be good. But it certainly is not informed. Ideally, the patient should be able to imagine what life would be like if he or she took a particular action. This requires knowledge and can be assessed through a variety of comprehension tests. In a recent survey about mammography that involved 1300 insured women, we found that about one third of women in their 40s said that they were confused about how often to have mammography.² Confusion was related to many negative attitudes and behaviors. Confused patients cannot make good decisions. Physicians should assess whether patients are confused and provide appropriate information and discuss alternatives.

Potential Benefits and Risks

Because patients tend to overestimate the benefits of many medical interventions, including mammography and genetic testing, being aware of potential benefits and risks is important.³ Recent articles^{4–6} have discussed the challenge of translating population data into the language of individual patients. To make informed decisions that are also good decisions, patients must have this information—not just relative risks for the studied population.

Optimal patient decisions require information tailored to individual needs. Most patients prefer quantitative risk estimates in making decisions about genetic testing for *BRCA1* and *BRCA2* mutations. But a small proportion prefers qualitative estimates.⁷ Ideally, patients should be able to obtain information

when they want it and in the amount and format they prefer. Many physicians were surprised that, after being asked about their preferences for genetic testing decisions, many women wanted “as much information as possible” about many of the topics.⁷ Print media and other materials for patients should be tailored for the individual. Physicians can ask patients to identify the risks and benefits of an intervention in their own words to assess their comprehension of the proposed intervention.

Next Steps

There is a rich counseling literature based on decisional counseling and decisional balance.^{8, 9} People being asked to take an action, especially one that requires a long-term commitment (such as receiving hormone replacement therapy), should be encouraged to examine their own preferences. This is something many of us do when faced with important life decisions. Should we buy the house, take the new job? We develop mental or actual balance sheets. But we have not systematically encouraged such examination among our patients. We must develop the tools to encourage patients to assess their choices, and then we ought to be willing to engage in a dialogue with patients about their balance sheets. In our research at Duke University, we have been developing and evaluating tailored decisional balance sheets to help patients examine the pros and cons associated with various interventions.¹⁰ Many other kinds of decision aids can also be used to facilitate this process.¹¹

Ultimately, fostering our patients’ ability to make good decisions shows respect for patient autonomy. In non-life-threatening situations, a patient’s decision should be his or hers alone. We must respect a patient’s right to make a decision that might differ from what we would choose for ourselves. We can and should assess many dimensions of the decision, including whether the patient considers the decision to have been autonomous and his or her level of satisfaction with the decision.

To help patients make good decisions, we need to find educational strategies that can be individualized to patients and adapted to the needs of medical practices in the managed care era. Such strategies must be based on a recognition that many patients are medically innumerate.¹² And given the heterogeneity of our society, such information also must be culturally sensitive. Informed decisions are a tall order in a world buffeted by managed care and shrinking time for the doctor–patient encounter. But the payoff may be not only informed

decisions but new health management partnerships between doctors and patients.

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BARBARA K. RIMER, DrPH

Director

Division of Cancer Control and Population Sciences

National Cancer Institute

Bethesda, Md

Making good decisions—thinking smart—remains a pillar of high-quality medical practice. In attempting to improve our clinical decision-making ability, we focus on standard guidelines for disease management, outcomes of alternate strategies of care, and occasionally the processes by which we interpret evidence and apply it to patient care. Although such evidence can be drawn from experience with groups of patients, it often needs to reflect the individual circumstances of the patient sitting before us. Over the past several decades, we have become increasingly respectful of the patients' central role in making decisions about their care. Outstanding clinical decision making must reflect partnerships between clinicians and patients. Such partnerships must be based on trust, clear and open communication, and mutual respect.

Aside from ethical considerations, why should decisions reflect the preferences of the individual patient? Using a patient's own values to drive a clinical decision substantially increases the likelihood that the patient will follow the management plan and enhances the probability that he or she will view even an adverse outcome more favorably. This is the clinical analogue to the “buy-in” process now well recognized in other arenas: The ultimate plan should integrate components and ideas from as many interested parties as is feasible.¹ As physicians, we rarely can make good decisions *for* our patients—we must strive to make good decisions *with* our patients.

Recent publications provide clear and logical approaches to analyzing the nature of problems we face and to making good decisions.¹⁻³ On the basis of these new guideposts and our quarter century of experience in applying the principles of clinical decision making to our own practices,⁴⁻⁶ we now reflect on how to recognize good clinical decisions and, perhaps by implication, how we can improve the choices we make.

Although we might be tempted to evaluate each decision by the outcome it achieves, outcomes can be misleading as a measure of the quality of a decision—that is, as a way to determine whether the choice was, in fact, a smart one. A given decision in a single patient typically has only one outcome; good and bad decisions can have both good and bad outcomes. Evaluating an individual decision in retrospect can be dangerous for another reason—the retrospective or post hoc evaluation of the impact of a particular outcome can be quite different from the value or impact assessed prospectively. For example, one study demonstrated that women's preferences for anesthesia before and after labor differed sharply from their preferences during labor.⁷ Preferences change, patients adapt to disability, and regret over bad outcomes perceived as the “responsibility” of the decision maker can be quite severe.

Outcome analysis measures the quality of decisions in the aggregate. First, we must decide on what basis the outcomes are to be evaluated. Focusing primarily on

mortality has the effect of ignoring morbidity; but many, if not most, medical therapies address the relief and prevention of morbidity. Under such circumstances, disease- or treatment-related mortality is merely an unwanted complication, not a primary target event to be used alone to measure the quality of the decision. For example, in deciding whether to replace the hip of an elderly man with disabling arthritis, survival alone would be an unreasonable outcome measure. If morbidity, functional capacity, and quality of life are to drive our choices and if those decisions are then to be evaluated, we must determine how those attributes of outcome are to be measured. If decisions reflect, as they should, differences in patient preferences, such individual differences need to be included in the aggregate outcome measure. If individual patient preferences are not reflected in the outcome analysis, then decisions that respect variations in such preferences are unlikely to appear optimal on objective measurement. The power of pairing the decision and its outcomes with the circumstances and preferences of the individual patient (rather than connecting the decision to the average preferences of a population) is in some ways analogous to the power of a paired compared with an unpaired Student *t*-test.

If we cannot identify a good decision on the basis of its outcome, then we must conclude that good decisions should be identified on the basis of the process by which they were made. We should consider who was involved: Were both the clinician and the patient (and perhaps relevant third parties) involved? If decisions were being made in a specialty setting, was the primary or principal care provider an active participant? We should also consider how the decision was made: Was the reasoning explicit and thereby subject to scrutiny and discussion? Were appropriate evidence and data, if available, incorporated into the process? Was the decision drawn from a guideline and, if so, was that guideline appropriate for this patient and was it properly adapted to reflect individual circumstances?

Consider genetic counseling about prenatal diagnosis or genetic testing. What objective outcome measure should be applied to evaluate the success of medical genetic care? In the case of mid-trimester ultrasonography and amniocentesis that reveal a trisomic fetus, the role of the clinical geneticist is to verify the test results, ascertain the diagnosis, and estimate the degree of fetal functioning and the severity of the malformations. Next, the physician should estimate and communicate survivability; expected functionality; and the likely medical, social, financial, and personal complexities of raising a child with a genetic disorder. In medical genetics, the clinicians' commitment to be objective, evidence driven, and nondirective sometimes leaves patients feeling

unsupported and bewildered. A good decision-making process should support patients without being directive (e.g., "Given *your* values and current risks, the benefit of testing would seem to outweigh the complication rate").

Whether to continue the pregnancy is, of course, up to the prospective parents. The risks and benefits of the alternatives, recent research results, opportunities for care, and individualized interpretation of population data need to be communicated to the parents, in their own language, with sensitivity to variations in education and culture and with respect for their distress. Use of decision-analytic models and the assessment of the patients' utilities or value-based preferences about outcomes may be helpful, if performed with sensitivity and respect.⁴ If the couple values life at any cost, has strong religious beliefs, or is influenced by family and neighbors, the decision may not abide the clinician's logical, perhaps model-based, suggestions. First-time parents have little concept of what quality of life means for a child or for the family unit. The prospect of losing what might be their only child from miscarriage caused by further testing may strongly outweigh the fear of retardation or congenital anomalies. For other couples, the possibility of developmental delay or malformation represents a sufficient threat to drive their decision toward termination of the pregnancy.

Regret, loss of hope for the "perfect" child, burden of loss, burden of care, pleasure at a smile or achieved milestone, guilt over termination, societal critique of a pregnancy's outcome ("Your baby has something wrong. Didn't you have that *test*?" or "I thought people abort for *that*!" or "How could you have aborted for *that*?") influence the couple's retrospective assessment of their choice and their clinician's role in supporting that choice. When their values, at the time, have driven the prenatal diagnostic or termination choice or the tertiary treatment decision, the outcome may be painful, sad, or joyful, but it is *theirs*, as full participants.

What guidance can we offer patients and clinicians about making and recognizing good decisions? Perhaps the quality of a decision can be measured by how many of the following criteria are met.

- Be explicit and scrutinize the logic of each step of the decision.
- Define the problem or dilemma.
- Identify the goals or objectives of the choice.
- Specify the consequences and the relative values of those outcomes for each strategy.
- Be explicit about the uncertainties.

- Examine the trade-offs involved among the strategies.
- Include all the relevant parties in the process.
- Don't shoot from the hip, don't follow guidelines blindly, and don't be impatient. Rather, apply logical inference, resolve conflicts by examining hidden assumptions, and identify the core problem or issue.
- For each management strategy, be sure to look for potential negative consequences or adverse effects and see what steps could be taken to minimize or even eliminate those negative branches.
- Establish a step-by-step management plan by carefully looking downstream.

We believe that the careful application of these principles^{1-3, 5} will produce better decisions, better outcomes, and in the long run more satisfied patients and clinicians. Perhaps the best way to recognize a good decision is by the company it keeps: logic, explicitness, sensitivity, communication, and respect.

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SUSAN P. PAUKER, MD

Chief Medical Genetics Department

Harvard Vanguard Medical Associates

Assistant Professor of Pediatrics

Harvard Medical School

STEPHEN G. PAUKER, MD

Vice Chairman of Medicine for Clinical Affairs

New England Medical Center

Sara Murray Jordan Professor of Medicine

Tufts University School of Medicine

Boston, Mass

What makes a good decision? This disarmingly simple question lacks a clear answer. A decision is the choice between alternatives. A choice between alternatives often leaves the outcome in doubt because chance events determine the outcome ("decisions under uncertainty"). The assignment in this essay is to explore the meaning of a "good" decision under uncertainty.

I argue that a good choice maximizes the patient's expected utility. "Utility" is a numerical measure of preference, showing how much a patient values an outcome state relative to other outcome states. "Expected" utility is simply the utility of a decision alternative averaged over many decisions and their outcomes. Expected-utility decision making has a rich history, dating back to the work of the mathematician John von Neumann and the economist Oskar Morgenstern. They showed that if you measure the patient's utilities in a certain way, the patient *should* choose the decision alternative with the highest expected utility. That is, the expected-utility decision maker will seek to maximize the patient's expected utility.

Choosing the decision alternative with the highest expected utility is a practical approach for decisions under uncertainty because the outcome of a decision in an individual patient is subject to the play of chance. Choosing the alternative that intuition suggests will work out best for the patient is a risky strategy. The safe strategy is to be consistent: Always choose the decision alternative that has the highest expected utility. By doing so, you maximize the patient's likelihood of a good outcome.

How Should We Evaluate a Decision?

We could evaluate the choice itself, the clinical outcome, or the process of making the decision. A normative approach to evaluating a decision defines a reference standard (i.e., the norm) and then evaluates the individual decision against that standard.

If an expected-utility decision maker evaluated the choice itself, the reference standard would be the

decision alternative with the highest expected utility. If the decision maker chose that alternative, the decision would be "good." This definition of "good" is attractive, but it leaves me dissatisfied, because agreement may result from chance. In a profession like medicine, what happens before the decision is as important as what happens after it. I am interested in good decision making.

Should we evaluate a decision by the clinical outcome that follows the decision? I don't think so. In decision making under uncertainty, chance determines the clinical outcome. It seems unfair to penalize the decision maker because the patient had bad luck in the health care equivalent of a game of blackjack in which the patient drew a face card instead of standing pat after having been dealt a 10 and a 2. Of course, luck averages out in the long run, which is the operative principle of expected-utility decision making. Therefore, although evaluating an individual decision by its outcome seems unfair, evaluating a decision maker by the outcomes of many decisions is a reasonable operating principle.

The fairest way to evaluate an individual decision under uncertainty is to evaluate the *process* used to make the decision. This method reflects one of the societal roles of a member of a profession: to guarantee the integrity of a professional service.

What Are Inputs to a Good Decision?

What process should a decision maker follow? The expected-utility decision maker has a ready answer: the requirements for making an expected-utility decision. The expected utility of a decision alternative is the probability of the outcome multiplied by its value, the two inputs required for a decision.

Characteristics of the patient determine the probability of the outcome. Therefore, the predecision process should ascertain the characteristics that determine the probability of the outcomes. For treatment of a known disease, we seek the characteristics that predict success with the treatment options. If the diagnosis is uncertain, the characteristics that determine probability of disease are important.

Characteristics of the patient also determine the value of being in an outcome state. One measure of an outcome is the average time in the outcome state multiplied by a number that measures how the patient values being in that outcome state. By "quality-adjusting" time in an outcome state, one converts all outcomes to the same measure: time in good health. The effective deci-

sion maker must ask about the value that the patient places on each outcome state and inquire about the clinical characteristics that predict how long the patient will be in each outcome state.

What Is a Good Decision?

In a good decision, the clinician first obtains the needed data: clinical characteristics and the value that the patient places on the outcomes. Second, the clinician integrates these two components by calculating the expected outcome of each decision alternative. Third, the clinician identifies the decision alternative with the highest expected outcome.

So far, the decision process has followed the precepts of expected-utility decision making to the letter. But now I am going depart from the script and propose that the decision maker use the decision alternative with the highest expected utility as the *input* into a process of shared decision making, rather than as a prescription for action.

Thus, I propose that the physician talk with the patient about the decision alternatives. It's appropriate to explain that the decision alternative with the highest expected utility is the safest choice but not appropriate to insist on it. Thus, the expected-utility decision maker might say, "This action seems best to me for the following reasons, but here are the alternatives and their consequences. Did we miss anything that's important to this decision? Does this decision alternative feel right to you?" Then, after gaining the patient's assent, the moment has come to take action.

What is a good decision? It is a process that begins with data gathering, continues with the identification of the decision alternative with the highest expected outcome, and ends with a process of shared decision making, in which the physician explores the patient's feelings about the decision alternatives, advocates for the decision alternative with the highest expected utility, but accepts the patient's decision.

HAROLD C. SOX, MD

Joseph M. Huber Professor and Chair of Medicine

Department of Medicine

Dartmouth-Hitchcock Medical Center

Lebanon, NH