

## The Role of Prognosis in Clinical Decision Making

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"Prognosis" may be taken to mean the course of a disease foretold in advance, and "prognostication" may be taken to mean the act of foretelling, typically by a physician. Robert Hutchison observed in 1934 that "Of the three great branches of clinical science—diagnosis, prognosis, and treatment—prognosis is admittedly the most difficult. It is also that about which least has been written and of which our knowledge is least systematized."<sup>1</sup> To this day, formal professional attention to prognosis, both in the field of medicine as a whole and in the everyday care of patients, is often relegated to a secondary status; textbook entries tend to ignore prognostic issues, medical schools neglect formal education in prognosis, and physicians prefer to avoid the topic.<sup>2</sup> Yet while prognosis is not as prominent or explicit a part of medicine as diagnosis and therapy, it is nevertheless fundamental to much of clinical practice. In what way does or should prognostic information influence internists in their practice—in their clinical decision making and in their interactions with patients?

### WHAT INTERNISTS PREDICT

Circumstances in which physicians and patients require prognostic information are not uncommon. Patients with rheumatoid arthritis want to know whether and when they might become severely disabled; patients with Alzheimer's disease and their families want to know the likely course of cognitive decline and when to expect that specialized services might be needed; patients with hypertension want to know their chances of having a stroke or a heart attack and whether treatment can be expected to modify these chances; patients with benign prostatic hypertrophy want to know what they can expect with watchful waiting as compared with other treatment strategies; patients with breast cancer want to know their chances of survival to a certain point in time; patients with diabetes

want to know the likely interval of time until they go blind or require dialysis; patients with a family history or a genetic test suggestive of colon cancer want to know their risk of developing the disease; patients about to undergo surgery want to know their likely postoperative course; patients with terminal illness want to know when they should be referred for hospice care; and so forth. General internists are indeed called upon to predict the occurrence and timing of many different clinical outcomes, as shown in Table 1.

Notwithstanding the fact that internists may make predictions about a number of important occurrences in the future of a patient's illness, death is the end point that receives the most attention. This is partly a result of the fact that death is usually the most serious end point of concern to both patient and physician, but also partly a result of the fact that it is more objectively determinable. Predictions about death, and the expected timing of its occurrence, inform a host of secondary decisions that general internists are called upon to make, such as deciding how aggressive to be in diagnostic workups or therapeutic interventions, deciding whether to withdraw life support, deciding whether to admit the patient to an intensive care unit or a hospice, and deciding how and whether to approach a patient for an advance directive.

### HOW INTERNISTS SHOULD PREDICT

In determining *how* to render a prognosis for the items listed in Table 1, clinicians must give attention to two distinct domains: how to formulate a prognosis and

Table 1. Outcomes for Which Physicians Might Predict Occurrence or Timing

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| Side effects                            |
| Complications                           |
| Pain, symptoms, or suffering            |
| Intervention or surgery                 |
| Physical or mental morbidity            |
| Institutionalization or hospitalization |
| Loss of function or independence        |
| Recovery                                |
| Death                                   |

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how to communicate it. The first domain involves the acquisition and review of both patient-specific and generic information, and it should involve an assessment of the clinician's own performance in developing prognoses. The second domain involves sensitivity to and an understanding of both the patient's and the clinician's values.

Ideally, assessment of a patient's prognosis should be deliberate and explicit. To support physicians in the achievement of this objective, an increasing amount of prognostic information is available, especially regarding the outcome of mortality, for conditions as diverse as AIDS,<sup>3</sup> lung cancer,<sup>4</sup> and brain injury,<sup>5</sup> and a resource outlining the prognosis for numerous diseases exists.<sup>6</sup> In addition, landmark studies of survival of patients in intensive care units have led to several scales seeking to predict the outcomes of critically ill hospitalized adults.<sup>7</sup>

When relying on published studies reporting objective prognostic information, however, clinicians should be careful to properly evaluate the reported findings.<sup>8,9</sup> Attention should be directed at the representativeness of the sample, the length of follow-up, the relevance of the outcomes examined, the objectiveness of the outcomes studied, the appropriateness of adjustment for other important prognostic factors such as comorbid conditions or psychosocial factors, and the accuracy of the predictions in independent samples of patients.

There are many clinical examples of the foregoing concerns. For instance, with respect to sample representativeness, some work has suggested that the level of apolipoprotein E predicts the likelihood of developing Alzheimer's disease; however, this work is based on patients seen at a tertiary memory disorders clinic, with a large proportion of patients having a family history of Alzheimer's. With respect to length of follow-up, some work using an 18-year follow-up of transfusion-associated hepatitis C shows similar outcomes for patients with hepatitis C and control patients who received transfusions but did not contract hepatitis; however, adequate follow-up for such a study might require 35 years. With respect to the relevance of outcomes examined, studies of the outcome of newly diagnosed prostate cancer in older men may focus on duration of survival and neglect health-related quality of life or disease-specific quality of life. With respect to adjustment for comorbid conditions or psychosocial factors, patients with myocardial infarction who are depressed may have different outcomes than those who are not depressed.

In clinical practice, however, deliberate review of published prognostic information about a patient's condition and consideration of the extent to which it should be adjusted tend to be uncommon. Usually, the patient's prognosis is estimated with subjective clinical judgment, without reference to sophisticated test results or published findings. This is not necessarily problematic. Indeed, when physicians are given the results of objective tests or of formal prognostic staging systems, it is frequently the case that such information, on average, improves the ac-

curacy of their prognostic assessment very little, if at all.<sup>7,10</sup> However, although physicians as a group may perform very well in many circumstances, not all physicians perform equally well. Individual physicians should be aware that their prognostic performance might be suboptimal. They should be aware of the possibility that their subjective estimates may be in error and that their estimates may be enhanced by study of, and comparison with, objective standards.

Physicians should also be aware of the role of their own biases in making prognoses. As in other areas of clinical decision making,<sup>11</sup> physician attributes may play a significant role in interphysician variation in prognostication. For example, the degree to which physicians are optimistic or believe in the self-fulfilling prophecy may influence the prognoses they formulate and the secondary decisions they make.<sup>2</sup>

After identifying what to predict and developing a prognosis, physicians must consider how to communicate the prediction. In this activity, once again, physicians' psychosocial attributes and values may influence how they discuss prognoses with patients and families. For example, physician discomfort with discussions that presume a bad prognosis may lead to significant deficits in the quality of these discussions.<sup>12</sup> Or older physicians may be more circumspect in offering prognoses than younger physicians.<sup>2</sup> Similarly, patient attributes may also be highly relevant to the way physicians choose to communicate prognostic information. For example, different ethnic groups may have different preferences regarding autonomy and the communication of prognostic information.<sup>13</sup>

Regardless of whether prognostic assessments are subjective or objective, however, physicians should consider two points: First, physicians should clarify in their own minds the link, if any, between their prognostic assessment and their consequent decision making. Second, they should consider the ways that they and their patients might benefit from explicitly discussing how the prognostic assessment is linked with diagnostic and therapeutic recommendations. These and other steps that clinicians should take in incorporating prognostic information into their decision making are summarized in Table 2. Some of these steps are illustrated in the following clinical case.

## A CASE

Mrs. Smith, an 85-year-old woman with a history of hypertension, osteoarthritis, and two previous myocardial infarctions, came to the emergency department with an acute abdomen. It was eventually discovered that Mrs. Smith had a perforated cecum at the site of an adenocarcinoma. She underwent successful resection of the primary tumor with primary reanastomosis, but it was apparent at surgery that there were multiple, unresectable

Table 2. Steps in the Use of Prognostic Information

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| Identify objective measure of prognosis, if available and if necessary.                           |
| Assess the validity and reliability of the measure.   |
| Assess the utility and relevance of the measure.  |
| Evaluate how the patient's unique clinical or social attributes modify the prognosis.             |
| Evaluate how the prognostic assessment informs the plan of action under consideration.            |
| Consider the benefits of discussing the prognosis.  |
| Evaluate how personal or social attributes of the clinician influence the prognosis.              |
| Discuss the prognosis with the patient and family.  |
| Consider how the patient's values or preferences influence the discussion and the decisions made. |

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metastases to her liver. Mrs. Smith was referred by the general surgeon to a general internist for ongoing primary care at the time of discharge from the hospital.

At the initial visit, the internist reviewed Mrs. Smith's medical history, evaluated her current status and concerns (she had recovered well from surgery and was, in fact, without symptoms), and asked about her preferences for receiving information and for decision making. Mrs. Smith replied that she had always been a "straight shooter" and that she preferred to be told the facts directly and honestly so that she could make decisions. This led the internist to a frank discussion of the prognosis for someone with colon cancer metastatic to the liver, including the fact that median survival reported in most studies has been about 6 months (with most patients living 3 to 24 months) and that the only therapy having a notable impact on survival is surgical resection of the metastases—something not possible in Mrs. Smith's case.<sup>14</sup>

The discussion then turned to the likely course of Mrs. Smith's illness and what kinds of symptoms to anticipate. The physician and the patient agreed on a care plan that focused on palliation of symptoms and maintenance of function and dignity. As part of that care plan, the internist informed Mrs. Smith that because patients with metastatic cancer do not survive to leave the hospital after undergoing cardiopulmonary resuscitation,<sup>15</sup> the internist planned to write a "do not resuscitate" (DNR) order that would be used in the event that Mrs. Smith was readmitted to the hospital. Mrs. Smith agreed to the DNR order, and executed a living will during that clinic visit. In light of the discussion of goals of care and the median survival of 6 months for similar patients, one last topic the internist broached at that clinic visit was referral for formal hospice home care. The decision at the end of the conversation was to defer hospice referral initially, especially in view of the patient's lack of symptoms and her excellent functional status. Subsequently, when Mrs. Smith developed abdominal pain and weight loss, she was prescribed medication for pain control and was referred for hospice care. She died at home 6 weeks after referral, with symptoms well controlled and her family in attendance.

This case illustrates several points. Published information on the prognosis of colon cancer needed to be

seen in light of the fact that Mrs. Smith was 85 and had significant comorbidity. Knowledge about the prognosis in colon cancer patients in general, and Mrs. Smith's prognosis in particular, influenced a number of the clinical decisions made, including the decision not to resect the metastases, the care plan, the DNR order, the living will discussion, and the hospice referral.<sup>16</sup> These decisions were also influenced by attributes of both the internist and the patient: the internist was an experienced geriatrician who was comfortable making such decisions, and the patient had a psychology disposed toward direct communication.<sup>17</sup> Obviously, the clinical facts, treatment options available, preferences of patients and physicians, and family wishes may make many cases more complicated than the one depicted above, or at least cause the care plan to be worked out over many more encounters. Nevertheless, the clinician in the above case was skilled and comfortable discussing bad news with patients,<sup>18,19</sup> had accurate information at hand, was able to properly adjust the information for the patient's clinical and social circumstances, and was able to adjust his management accordingly.

## PROGNOSTICATION IN CLINICAL PRACTICE

Many of the types of clinical and ethical decisions that general internists make are based, at least implicitly, on prognosis. Moreover, patients often request prognostic information. Prognostic information is and should be an important factor in the care offered by general internists. Routinely addressing each of the steps outlined in Table 2 will help ensure that potentially important modifications in patient management are not overlooked. Properly viewed, rather than being a unidirectional (doctor to patient) disclosure of medical fact, prognostication in clinical practice is a dynamic, iterative process. This process should be shaped by the unique characteristics and values of each patient. Physician self-awareness ensures that the characteristics and values of the physician do not intrude unnecessarily into the process. When general internists attend to prognosis in such an explicit fashion, it is likely that they will discover that the literature does not always contain the kind of prognostic information that

they desire in caring for patients with multiple comorbid conditions. This should lead to another fruitful iterative process—this one involving clinicians and investigators—resulting in more and better prognostic information to answer the questions encountered in practice.

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