Prognostic Indices in Clinical Practice

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PROGNOSTIC INDICES ARE USED EXTENSIVELY IN CLINI-cal research and health service quality reviews to adjust for patients' severity of illness. Given their ubiquitous use in clinical studies, it seems surpris-ing that prognostic indices are rarely used in clinical prac-tice. Such disregard seems to persist even if a prognostic in-dex addresses an important outcome, is derived by rigorous methods, and appears in a prestigious journal. Consider the article by Walter et al[1] in this issue of THE JOURNAL that re-ports that older patients hospitalized on a general medical service have about a one-third risk of dying in the year fol-lowing discharge. The 6 characteristics that can be used to predict a patient's specific risk are male sex, dependence in activities of daily living, cancer, heart failure, renal insuffi-ciency, and hypoalbuminemia.

This study has important implications for care in that age was no longer a predictor once these 6 factors were taken into account, thereby illustrating the importance of assessing func-tional status in older patients. However, despite the excel-lent performance characteristics of this index (superior to the widely used Charleston index and APACHE [Acute Physi-ology and Chronic Health Evaluation] score), clinicians are unlikely to use such a prediction score in clinical practice.

The most immediate problem with prognostic indices re-lates to limitations of human memory. Without a mne-monic, the 6 elements in the prognostic index for elderly patients are hard to remember. The numerical factors and conversion summary table are even more difficult to accu-rately recall. The advent of palm computers helps to alle-viate this pitfall, yet no technology is as convenient as in-stant human memory. For this reason, the Apgar index for newborns has remained popular because its 5 components form an acronym of the inventor's surname (activity, pulse, grimace, appearance, respiration) and because it computes as a simple arithmetic sum to 10.[2,3] Unfortunately, there is no similar elegant index for clinicians to apply toward the end of a patient's life.

A related problem is distraction because many other pieces of information are competing for the physician's attention.

The prognostic index for elderly patients is available for free, will not be directly supported by a large financial industry, and will therefore enjoy no forceful promotion. Many cli-nicians will never hear about it. The only immediate incen-tive for a clinician to use this index is that the results might help in patient decision making by providing useful plan-ning information. A second immediate benefit might be to improve patient satisfaction if patients perceived the phy-sician using such an index as being "up-to-date." Yet many sick elderly patients lack the numerical skills needed to converse in the language of probability. Furthermore, elaborate efforts with patient decision aids do not always provide a significant patient benefit.[4]

The use of prognostic indices fits the ideals of evidence-based medicine,[5] yet those same ideals also highlight flaws in study methods, such as missing data (eg, social status was not measured) or uncertain applicability (eg, obsolescence due to improving medical technologies). Critics can also point to past predictive indices that could not be replicated when tested broadly and advocates have yet to identify a major success where predictive indices led to a major improve-ment in patient mortality or morbidity.[6,7] Moreover, cur-rent indices are far from perfect; even the area under the receiver operating characteristic curve of about 0.8 in the study by Walter and colleagues[1] is not ideal and could jus-tify waiting for better solutions.[8]

Prognostic indices are also a bit demoralizing. First, they typically include factors that are outside of a physician's or patient's control, such as male sex, as in the study by Wal-ter et al.[1] This first concern smacks of fatalism and could incite unsavory images of withholding useful treatments from dying patients based on demographic characteristics. Sec-ond, indices are rarely compared directly with the intuitive judgments made by physicians responsible for the patient, leaving unanswered the issue of whether prognostic indi-ces are redundant with what the clinician already knows. Both these concerns detract from clinical enthusiasm.[9]

Medicine is an action-oriented profession in which cli-nicians want to relieve suffering, rather than just watch its course. Regrettably, most prognostic indices are not accom-

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panied by decision thresholds that convert level of risk into degree of action. For example, the prognostic index for elderly patients developed by Walter et al[1] does not show how a patient with a 35% risk of dying should be treated differently from one with a 20% risk of dying. Advance planning about treatment goals and preferences is warranted in either case. Decisions about medications mostly revolve around medical diagnosis, and not numerical prognosis. Furthermore, individuals are insensitive to small changes in midrange probabilities so the patient's own choices might not even change.[10]

One common problem in giving a numerical prognosis to a patient is in communicating imprecision and allowing for hope. The prognostic index for elderly patients partially addresses this difficulty by offering confidence intervals in the final bedside rule. A more basic limitation arises from the general dislike of ambiguity and demand for precise probability values.[11] For this reason, patients might prefer the metric of life expectancy because it is expressed in years, has a natural analogue to the familiar concept of life span, and is automatically recognized as inexact.[12] Unfortunately, the brief nature of most clinical studies forces results to appear as risks of death rather than estimates of life expectancy.

The strongest argument for prognostic indices is that they facilitate professional communication. Adjectives such as *rarely* and *usually* are notoriously ambiguous whereas numbers are clear and compact.[13] In medical practice, the easiest place for clinicians to use numerical prognostic information may be in discussions with colleagues, particularly if the other clinician is from a different specialty. Doing so avoids major misunderstandings due to differences in clinical culture and also reduces the chance that the message will be misquoted. The prognostic index for elderly patients, for example, might not find a place in soulful discussions with patients but it may be suited to hospital discharge dictation letters sent back to community physicians.

The language of probability will not dominate medical discourse anytime soon. However, prognostic indices may increase in popularity so that even traditional clinicians may encounter a numerical prognosis and wonder what to do if the estimate conflicts with their judgment. Clinicians may dispute the elderly prognostic index, for example, which shows that age is irrelevant for predicting a patient's 1-year mortality once functional status and the 5 other factors are assessed. In cases for which such prognostic information is essential, research demonstrates that clinical judgment is fallible and that simple indices are more reliable.[14,15] Using numerical prognostic information may help physicians validate their clinical impressions and correct some faulty beliefs.

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