The Design and Use of a Health Status Index for Family Physicians

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This paper describes a Health Status Index (HSI) which is part of a patient encounter form in a family practice center. The Index, which is used to profile a patient's health status longitudinally, combines physical and psychosocial measures of health. Based on its use in the center and through the presentation of data on patient health status, the authors illustrate how the Index can facilitate the evaluation of care and the management of practice. More specifically, they suggest that such data assist physicians in: (1) evaluating the effect of different modes of treatment on the duration and severity of ill-defined symptoms and complaints; (2) identifying high-risk patients for special attention; (3) indicating treatment modalities which produce more desirable outcomes; (4) determining the efficiency of different modes of treatment and of continued care; and (5) addressing chronological, as well as interpersonal and interprofessional, questions of providing continuous care for the chronically ill.

The family physician has responsibility for first contact, continuous care, and the management of available health resources on behalf of his patients.[1-3] In this paper we describe a Health Status Index (HSI) and discuss how it can assist family physicians in discharging these responsibilities. First, we define the component measures of the HSI and report the way in which it is completed in a family practice center. Then, using data collected via the Health Status Index, we discuss how it can assist physicians in the evaluation of care and the management of their practices.

Description of the HSI

The Health Status Index is one element of a patient encounter form which provides data for a health information system in a family practice residency training center. This center has a staff of 21 residents and two board-certified family physicians who manage over 1,000 patient visits per month. The HSI, which is used to profile a patient's health status longitudinally, combines physical and psychosocial measures of health (Figure 1). Symptoms are a physical measure of illness based upon the physician's observations and examination of the patient. Discomfort and inability to perform major activities are psychosocial measures of the existence of morbidity based upon the patient's reports. The definitions and classification of the psychosocial measures were adapted from those used by the National Center for Health Statistics in the United States National Health Survey.[4]

The categories of health included in the HSI are used to evaluate patient health status at three points in time: prior to the onset of the illness for which care is sought, at the time of the visit to the center, and three months after the visit. The first patient visit for an illness is considered to mark the onset of that condition. The patient's usual status prior to this onset is used as his baseline measure of health.

The severity of the patient's illness is defined by the degree of change in his status over two or more points in time. Comparing status prior to the onset of an illness with status at the time of each visit summarizes the impact of the illness on the patient.

The duration of an illness is defined by the length of time between onset and recovery or, in the case of long-term, continuing conditions, from onset to death. For an acute illness, recovery may be defined as the time when a patient resumes that status prior to the onset of illness. For chronic conditions, the HSI may be used to define the progression of the illness over some period of time. It is up to the judgment of the physician to determine if the observed changes in status for an individual patient represent an acceptable progression for that illness.

Completion of the Health Status Index

The HSI is completed by the attending physician for all patients at the time of each visit to the center (Figure 2). The patient is asked his usual health status prior to the onset of the present illness and his status at the time of the visit. These are recorded by the physician, along with his estimate of the patient's expected status in three months. This estimate is based on information available to the physician, including data from the patient's history, physical examination, laboratory and/or x-ray procedures, and diagnosis.

For the purposes of the HSI, the physician's estimate of the patient's status in three months is used to differentiate acute, short-term illness

from chronic, long-term problems. The use of a three-month time period to separate acute from chronic conditions is based on a convention established by the National Center for Health Statistics in their surveys of the health status of the United States population. In these studies, illnesses or conditions first noticed more than three months before an interview are considered chronic. Thus, a chronic, long-term problem is not subject to clinical definitions of resolution within three months and an acute, short-term problem is. Though acute conditions may be exacerbated by co-existing chronic conditions, they are considered to be etiologically separate from chronic conditions in the HSI. Therefore, a urinary tract infection in a diabetic patient would be considered a short-term problem, while an acute episode of the diabetic condition, such as ketoacidotic shock, would be considered to be related to the chronic condition.

When the physician decides a problem is short-term, he checks "short-term problem," notes whether a prescription drug was ordered, and estimates the number of days required for the patient to return to his functional status prior to the onset of the present illness. When the physician decides that an illness is not subject to resolution within three months, he checks the box labeled "long-term problem," indicates whether or not a prescription medication is being used to manage this problem, and estimates the patient's expected status in three months.

Table 1 describes the completion rate of the time components of the HSI for patients diagnosed as having one of ten common diseases at the time of their first visit to the center in 1975. The Table also includes the rates for patients with all other diseases and for those with no disease at the time of their first visit in 1975. These completion rates are based on a total of 2,674 patient visits. Exclusive of patients with no disease at first visit, status prior to visit had an average completion rate of 89 percent. Status at time of visit had a slightly lower rate of completion, but the average percent completed, exclusive of patients with no disease, was 87 percent. The third component of the HSI, expected status in three months, was

completed on an average of 87 percent of the time for all groups of patients except those without disease at the time of their first 1975 visit. This high rate of completion suggests that even where residents were asked to estimate or predict future outcomes, they generally were willing to provide an assessment. Thus, we have received reasonably good compliance among the residents in completing the HSI.

Uses of the Health Status Index

Studies of general and family practice indicate that a significant proportion of patients seeking care present with ill-defined symptoms and complaints which do not fit standard classifications of disease.[5,6] The Health Status Index can assist family physicians in assessing and treating these problems by providing a collection of integrated observations on the course of patients' illnesses. Katz and colleagues,[7] and Akpom, Katz, and Densen,[8] for example, have shown how measures of function can be combined with symptoms, clinical indicators of disease (laboratory tests and x-rays) and risk factors to create meaningful classifications of patient illnesses. The family physician can use such classification schemes to categorize ill-defined problems into homogeneous groupings in order to describe changes in the course of these illnesses and to evaluate the effect of different modes of treatment on the duration and severity of these problems. These schemes need not exclude standard disease classifications, but can provide additional information to assist the family physician in defining the course of and in treating ill-defined problems.

The HSI can also assist the physician in defining the course of long-term continuing conditions. For example, during a five-month period of observation, the health status of nine of 20 patients with essential hypertension improved, the status of one patient deteriorated, and the status of ten patients remained unchanged. Of the ten patients whose status remained unchanged, five had no coexisting chronic condition, two had osteoarthritis, two were obese, and one had diabetes mellitus. Three of the nine patients whose status improved had no other chronic condition, one had osteoarthritis, three were obese, one

had ischemic heart disease, and one had mitral stenosis. The one patient whose status deteriorated had ischemic heart disease and osteoarthritis. None of the 20 patients, however, sought care for acute conditions which might have distorted observed changes in health status. The presence of coexisting chronic conditions, therefore, did not appear to have any systematic effect on changes in health status. The one exception, perhaps, was the case of the patient who deteriorated over the observation period. This patient was the only one with a coexisting condition (osteoarthritis), as well as evidence of target organ involvement (ischemic heart disease) associated with the hypertension.*

Data such as these can assist family physicians in managing their practices. As they are accumulated they describe a distribution of outcome status over time that establishes outcome norms or standards for different illnesses. These norms can be used to compare patients' courses of illnesses and to identify those who deviate from the norm. They can also be used to examine the appropriateness of patient care, and to identify treatment modalities which produce more desirable outcomes. For example, physicians may wish to question whether or not it is acceptable for patients with hypertension to be symptomatic at the beginning and end of an observation period. If such an outcome is suspect, the physician might review in more detail the care given those patients whose status remained unchanged. Based on an audit of the patients' medical records, he may conclude that care is adequate and that the patients' status could not be improved or, he may decide to alter some aspect of care for these patients to achieve more desirable outcomes. Equally important, when desired outcomes are compared with information describing the
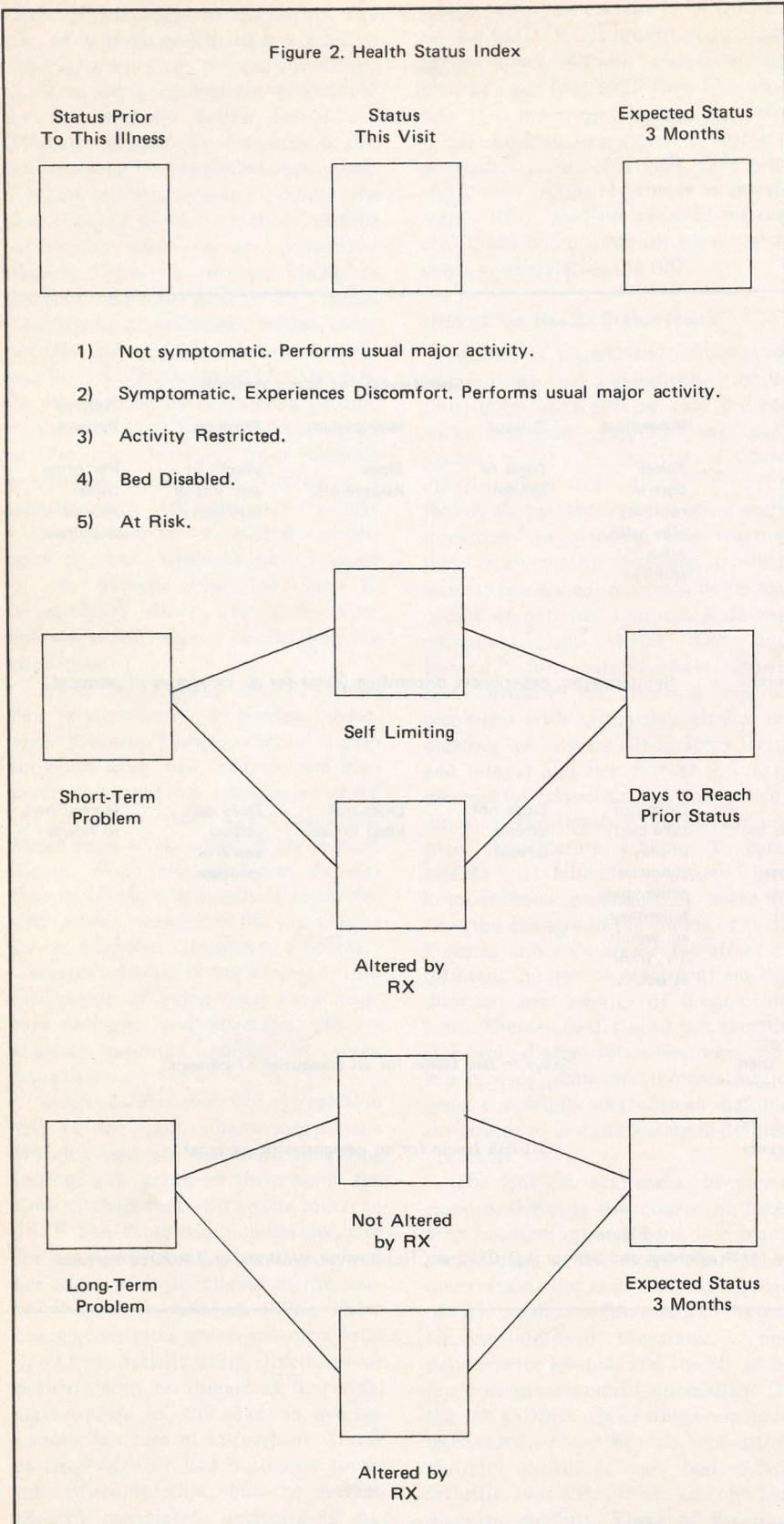

Health Status	Definition	Specification of Major Activity				
		Pre-School	School	Housewives	Workers	Retired Persons
Not symptomatic: performs usual major activity	People who are asymptomatic	Takes part in ordinary play with other children	Goes to school	Does housework	Works at any job or business	Performs usual retired activities
Symptomatic: experiences discomfort, performs usual major activity	People in whom symptoms are pronounced (ie, affect comfort) so that person recognizes change in usual health status	Symptomatic, experiences discomfort (same for all categories of persons)				
Activity restricted	People who are unable to engage in major activity, confined to house, almost completely inactive, not bed disabled	Does not take part in play activities other than sedentary, eg, watch TV, look at books	Does not attend school	Does not keep house	Does not attend work or business	Is confined to house
Bed disabled	People who stay in bed all or most of the day — more than 1/2 of hours person is usually awake	Stays in bed (same for all categories of persons)				
At risk	People with terminal illness	At risk (same for all categories of persons)				

Figure 1.
Definition of Health Status by Major Activity for Pre-School and School Age Children, Housewives, Workers, and Retired Persons

Figure 2. Health Status Index

Status Prior
To This Illness

Status
This Visit

Expected Status
3 Months

1) Not symptomatic. Performs usual major activity.

2) Symptomatic. Experiences Discomfort. Performs usual major activity.

3) Activity Restricted.

4) Bed Disabled.

5) At Risk.

Short-Term
Problem

Self Limiting

Altered by
RX

Days to Reach
Prior Status

Long-Term
Problem

Not Altered
by RX

Altered by
RX

Expected Status
3 Months

resources employed to produce them (eg, the cost of personnel and services), they enable the physician to determine the efficiency of different modes of treatment and of continued care. The Health Status Index, thus, helps the physician to successfully manage his practice not only by identifying those treatment modes that shorten the duration or reduce the severity of illness, but also by delineating the costs to himself and to the patient that are associated with producing desired outcomes (Table 2).

Finally, the Health Status Index can assist family physicians in providing continuous care, especially for the chronically ill, by describing the impact of the disease process on the patient and by indicating when additional health resources are needed to manage the patient. For example, as patients become restricted in their major activities and confined to bed for longer periods of time, physicians can plan with family members for the care of these patients. Can such patients continue to · be cared for at home, or should plans be initiated to secure an appropriate level of institutional care? The measures included in the HSI not only alert physicians to these questions, but they also provide a common language which doctors, nurses, social workers, and representatives of community agencies can use to discuss the options available to the patient. Thus, the HSI assists the physician in addressing chronological, as well as interpersonal and interprofessional, questions of providing continuous care for patients.

In summary, we believe a Health Status Index such as that described can assist family physicians in providing first contact and continuous care for their patients. Further, the HSI can assist physicians in managing their practices and in allocating the resources available in the larger health system for the benefit of their patients. The HSI is extremely valuable for describing the course of most acute and chronic diseases seen within a family practice center and is a good measure of patient outcome. It provides a summary measure of patient health and a mode of communication of patient needs among different health-care providers. The HSI, thus, can be an important instrument in the delivery of family-oriented health care.

Table 1. Completion Rates of HSI January through December 1975, for First Visit in 1975
by Patients Having One or More of 10 Frequently Occurring Diseases, Other Diseases, and No Diseases

Disease	Number of Patients	Status Prior to Illness Complete		Status This Visit Complete		Expected Status Three Months Complete	
		#	%	#	%	#	%
Hypertension	139	125	90	128	92	117	84
Upper respiratory infection	140	127	91	120	86	112	80
Diabetes mellitus	65	56	86	58	89	52	80
Depression	28	25	89	24	86	22	79
Urinary tract infection	49	47	96	45	92	44	90
Arteriosclerotic heart disease	18	14	78	13	72	12	66
Vaginitis vulvitis	48	45	94	43	90	43	90
Bronchitis	48	45	94	43	90	43	90
Arteriosclerosis	12	11	92	10	83	9	75
Osteoarthritis	11	9	82	11	100	9	82
Other	1,557	1,422	91	1,393	89	1,311	84
No disease	569	370	65	376	66	312	54
Total	2,674						

Table 2.
Average Number of Visits April through August 1975 and Average Charge
per Visit by Change in Health Status of 20 Hypertensive Patients

	Improved	Deteriorated	No Change
Average Number of Visits	4	6	5
Average Charge per Visit	$12.00	$25.00*	$10.00
Total Number of Patients	9	1	10

*The high average charge per visit for the one patient whose status deteriorated appears reasonable in view of the number of coexisting diseases which were identified.

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