Sociological Perspectives on Improving Medical Diagnosis Emphasizing CAD

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INTRODUCTION

Health care costs worldwide are increasing because of new medicines, new techniques, and more expensive and extensive research on diseases. It is essential that health care delivery systems be implemented that take advantage of these advances in a cost effective economic manner. One critical aspect of the health care delivery system is the improvement in diagnosis of disease. This paper emphasizes diagnosis and the need to collect key patient information "pivotal information" at the earliest possible point in the patient's disease process, and to put such pivotal information in physicians' hands. There is a potential for huge benefits in cost savings and greater effectiveness of treatment from these actions, but challenges must be overcome to realize their full benefits. The major problems include (1) market incentives in the current health care system fail to encourage collecting pivotal medical information as early as possible (2) physician resistance to some of these ideas and (3) technical and ethical problems that remain to be solved.

BACKGROUND

Previously, Fisher and Fisher (2014) discussed the problems of improving medical diagnosis as both a management and information problem. Their analysis focused on three specific strategies: improving medical histories of patients by using discourse analysis, public education about selected major diseases that if ignored can lead to health impairment and even death, and use of computer assisted diagnosis (CAD).

THE PROCESS OF DIAGNOSIS

Diagnosis is sociologically a process of bounded rationality, consisting of evidence gathering punctuated by a series of conjectures about a patient's ills before arriving at the *best* conjecture and treatment plan. This view of diagnostics originates from Zeldenrust's (1990) version of the garbage can model of organizational behavior that sees diagnosis as a linkage between a demand (patient with an illness) and a solution (physician guesses nature of underlying problem and offers a plan for treatment). The solution may include medicine, behavioral modification such as bed rest, change in diet etc., and perhaps tests to rule out certain competing diagnostic hypotheses consistent with applicable constraints. The physician builds on the information learned not only from the patient reports but also on test results and on other objective data obtained. The physician treats symptoms uncovered until the patient either is cured and a final diagnosis is achieved or at least until all competing hypotheses about the condition are ruled out.

Improving the diagnostic process hinges on rapidly expanding the diagnostic information available to the physician. This diagnostic information is not just any data but the sort that expands the number of hypotheses of possible diagnoses,

i.e. pivotal data. The physician can then examine the maximum number of plausible hypotheses. The idea is that *the more hypotheses the physician needs to rule out at the outset the more likely* the physician will find the disease(s) behind the patient's complaint and provide the proper treatment (including referral for specialized services). The process also covers multiple possible pathologies that may exist at any moment, although the clinician may place ordering priorities on these possible multiple pathologies.

A. The Medical History and Discourse Analysis

Medical authorities agree that the most important basic information beyond a description of the patient's medical complaints is the patient's health history. An encounter with any provider usually begins with some kind of questionnaire or interview with regard to that history. The needs of different providers often result in different kinds of questionnaires or approaches about health history. They likely cover all the same major issues, but the differences can be important. There is little evidence that these initial interviews involve people trained in discourse analysis. Since the Fisher and Fisher (2014) analysis, almost no real advances or progress have been described. In fact, clinical people are almost expected to develop interviewing skills by "osmosis" on the job. A surprising finding was that neither nursing nor medical curricula include formal course work on this although some medical schools give orientation lectures and guides to such interviewing skills. The technique is not included in the so-called "patient assessment courses."

Discourse analysis, popular in the United Kingdom, is basically the study of language in context (Elwyn and Gwyn, 1999). The subject shares much in common with assessments of communication that look at gestures (often referred to as "body language") –the "silent language" (Edward Hall, 1973). The discipline examines conversational processes: how is one version of events selected over another? How is a familiar reality described to give it an unquestionable authority? It then brings to bear on the patient's diagnosis *all the information* that patients are providing, and *saves it for future use*. It can identify and elicit previously hidden patterns and perspectives (for example, in patient clinics, among health visitors, and in transcripts of interviews conducted by HIV counselors). Their extensive list of references suggests that the technique has been widely applied in health care related situations with promising results.

The technique has a sound basis in social science and can be applied quickly by medical practitioners and should be included in the basic course work of the field. Discourse analysis seems to be easiest to implement in medical practices serving ethnically relatively homogeneous areas whose residents have a relationship with the medical staff. This has major implications for CAD.

B. Public Education

Although public education is not a diagnostic procedure, it garners public cooperation in early diagnosis and treatment of many serious illnesses. Its purpose here is not to impress on people to take better care of themselves, but rather to have targeted campaigns about specific conditions that if treated early are easily cured or managed, but if ignored, become extremely expensive to treat and perhaps lethal. Public education should put *pivotal* information in the hands of both the physicians and patients as early as possible in the disease process to maximize the probability of effective treatment at the lowest possible cost.

Patients who recognize the possible variety of symptoms of heart attack and stroke etc. will more likely seek treatment when the physician's intervention may be most certain to work, and probably least expensive. Some diseases, such as colon and pancreatic cancers often show few or no early warning symptoms and only make you uncomfortable enough to seek medical attention in their advanced stages. These diseases typify a propensity of people to avoid medical attention

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