

Willingness to Pay for Diagnostic Certainty

Comparing Patients, Physicians, and Managed Care Executives

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Cost-effectiveness analyses routinely ignore the value of diagnostic certainty. Moreover, no previous study has compared this value among different stakeholders. We surveyed 25 patients, 28 physicians, and 23 managed care executives to compare their willingness to pay for diagnostic information for peptic ulcer disease. Patients (84%) were most likely, and executives (43%) least likely, to be willing to pay at least \$1 (median willingness to pay < \$50). Differences in willingness to pay among stakeholders indicate potential for conflicts over access to tests. Although nearly all patients valued diagnostic certainty, its value was generally small and insufficient to change the cost-effectiveness ranking of treatment alternatives.

KEY WORDS: cost-effectiveness; diagnostic certainty; dyspepsia; peptic ulcer disease.

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Information provided by diagnostic testing is captured in cost-effectiveness analyses through the effects of test results on interventions and subsequent clinical outcomes. However, diagnostic tests provide additional benefits if decision makers value diagnostic certainty. Researchers have generally ignored the value of diagnostic certainty.¹ Thus, cost-effectiveness analyses understate the value of management strategies that include earlier diagnostic testing. This potential bias can be illustrated in evaluations of the role of endoscopy for patients with dyspepsia.²⁻⁴ Specifically, strategies that include immediate endoscopy provide more diagnostic information than strategies that do not. If this information (*in addition to its impact on patient management*) is highly valued, then cost-effectiveness analyses are routinely biased against endoscopy.

Although the patient's is the primary perspective from which to assess the value of diagnostic certainty, physicians and managed care organizations (MCOs) also

influence treatment decisions. The value physicians and payers place on diagnostic certainty can reinforce or conflict with patients' desires. If access to tests is limited because physicians' and payers' valuations differ from those of patients, patient dissatisfaction may arise even if outcomes are not compromised. No previous study has compared the value of diagnostic certainty among different stakeholders.

As a case study, we have examined the use of endoscopy for patients with suspected peptic ulcer disease (PUD). Although 20% or fewer individuals with symptoms suggesting PUD actually have an ulcer, treatment without testing to confirm ulcer presence has been widely accepted.⁵ Previously, we demonstrated the cost-effectiveness of empiric therapy relative to endoscopy before treatment.² While all evaluated strategies had similar clinical outcomes, empiric strategies saved at least \$423 per patient compared with immediate endoscopy. However, we did not quantify the value of diagnostic certainty. By recommending treatment without a confirmed ulcer diagnosis, we presumed the value of this information was less than the demonstrated cost differences.

Accordingly, our objectives were to assess and compare the value of diagnostic certainty for PUD to patients, physicians, and MCO executives, and to determine if including the value of diagnostic certainty changed the conclusions of cost-effectiveness analyses.

METHODS

To assess willingness to pay for diagnostic certainty from three perspectives, we surveyed patients, physicians, and executives in a primarily rural MCO with 175,000 enrollees in the northeastern United States. Physicians and executives were also surveyed in a northeastern, urban MCO. To ensure familiarity with the disease, patients were randomly drawn from enrollees identified in the MCO's information system as having a presumed or confirmed PUD diagnosis. At the patient's next scheduled clinic visit, the patient and the patient's physician were asked to complete their respective questionnaires. At the other MCO, all physicians at one multispecialty clinic were surveyed. At both MCOs, medical directors and executives at or above the vice president level were surveyed at staff meetings. Very high response rates were obtained (personnel at both sites reported no refusals).

The questionnaires presented a hypothetical vignette to isolate the value of diagnostic certainty from the test's clinical utility or perceived discomfort. The vignette stated that symptoms indicated a 20% probability of PUD, that

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the test (which was not named or described) entailed no pain or risk, and that duration and severity of symptoms depended on whether or not PUD was present, but establishing the diagnosis would not alter the course of symptoms.

Participants were asked their maximum willingness to pay for the test by choosing from eight categories ranging from \$0 to \$1,000 and above. Test cost was not mentioned because responses are frequently anchored to cost when such information is given.^{6,7} The question on willingness to pay defined the dollar amount as an out-of-pocket payment for patients, an expense for which the provider was at risk under capitation for physicians, or reimbursement the MCO would pay to include the test in a practice guideline for executives.

RESULTS

Table 1 contains descriptive statistics. Willingness to pay for diagnostic certainty for PUD appears in Table 2. Patients were most likely, and executives least likely, to value diagnostic certainty. Eighty-four percent of patients, 61% of physicians, and 43% of executives were willing to pay something for the information. Patients and executives ($p = .003$) and patients and physicians ($p = .060$) differed in their willingness to pay. The difference between physicians and executives was not significant ($p = .220$). Among those willing to pay for information, the me-

dian amount (\$10–49) was small and similar across groups.

DISCUSSION

In this study, most patients and physicians placed some value, albeit low, on diagnostic certainty for PUD. Conversely, most MCO executives did not value diagnostic certainty. The direction, if not the magnitude, of this inconsistency indicates the potential for conflict about access to services or content of practice guidelines if each type of stakeholder does not consider the perspectives of others.

To evaluate diagnostic tests, technology assessments should account for the value of diagnostic certainty. Although most patients and physicians valued diagnostic certainty, the amount they were willing to pay never exceeded \$250 (less than the \$423 necessary to change the ranking of treatment alternatives.)² Further, the inconvenience and discomfort associated with endoscopy offset, at least partially, any value of diagnostic certainty.

Asch and Hershey argued that cost-effectiveness analyses often provide little guidance for clinical decision making because of variations in patient conditions and preferences.⁸ Mushlin et al.'s study of magnetic resonance imaging for patients with equivocal neurologic findings demonstrates that preferences regarding diagnostic certainty can determine whether an intervention is cost-effective for a particular patient.⁹ Conversely, our study indicates that including the value of diagnostic certainty for PUD did not change cost-effectiveness rankings of management strategies even for individuals who placed the highest value on certainty. Recommendations against immediate endoscopy are immune to the criticism that some "patients want to know."

This preliminary study provides the first data on the important issue of how different stakeholders value diagnostic certainty. Further research is required to generalize these findings to larger, geographically diverse populations and to other diseases. Similar surveys quantifying the value of diagnostic certainty may generate information useful to patients, providers, and health plans faced with decisions regarding diagnostic tests.

Table 1. Descriptive Statistics

Characteristic	Value
Patients (n = 25)	
Age, years	53
Female, %	52
White, %	100
Education, %	
High school or less	48
College graduate	32
Marital status, %	
Married	72
Single	16
Widowed or divorced	12
Family income, %	
<\$20,000	40
\$20,000–\$40,000	36
>\$40,000	24
Physicians (n = 34)	
Age, years	43
Female, %	32
Specialty, %	
Gastroenterology	32
General internal medicine	45
Other	22
Executives (n = 26)	
Age, years	50
Female, %	4

Table 2. Willingness to Pay for Diagnostic Certainty of Peptic Ulcer Disease*

	\$0	\$1–\$9	\$10–\$49	\$50–\$99	\$100–\$249
Patients, n (%)	4 (16)	10 (40)	8 (32)	1 (4)	2 (8)
Physicians, n (%)	11 (39)	9 (32)	1 (4)	4 (14)	3 (11)
Executives, n (%)	13 (57)	1 (4)	6 (26)	1 (4)	2 (9)

*The differences between patients and executives ($p = .003$), and between patients and physicians ($p = .060$) were significant. The difference between physicians and executives was not significant ($p = .220$).

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