Awareness of Surgical Costs: A Multicenter Cross-Sectional Survey

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BACKGROUND: Resource scarcity continues to be an important problem in modern surgical practice. Studies in North America and Europe have found that medical professionals have limited understanding of the costs of medical care. No cost awareness studies have been undertaken in Australasia or specifically focusing on the surgical team. This study determined the cost of a range of commonly used diagnostic tests, procedures, and hospital resources associated with care of the surgical patient. The surgical teams' awareness of these costs was then assessed in a multicenter cross-sectional survey.

METHODS: In total, 14 general surgical consultants, 14 registrars, and 25 house officers working in three New Zealand hospitals were asked to estimate the costs of 14 items commonly associated with patient care. Cost estimations were considered correct if within 25% plus or minus of the actual cost. Accuracy was assessed by calculating the median, mean, and absolute percentage discrepancy.

RESULTS: A total of 57 surveys were completed. Of which, four were incomplete and were not included in the analysis. Cost awareness was generally poor, and members of the surgical team were rarely able to estimate the costs to within 25%. The mean absolute percentage error was 0.87 (95% CI: 0.58-1.18) and underestimates were most common. There was no significant difference in estimate accuracy between consultants, registrars, or house officers, or between consultants working in both public/private practice compared with those working in public practice alone.

CONCLUSION: There is poor awareness of surgical costs among consultant surgeons, registrars, and junior physicians working in Australasia. (J Surg 72:23-27. © 2014 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: cost awareness, general surgery, hospital costs, economics, clinical competence, medical education, lean health care

COMPETENCIES: Medical Knowledge, Practice-Based Learning and Improvement, Systems-Based Practice

INTRODUCTION

We live in a society of limited resources. The allocation of health care resources is complex and multidimensional involving national and local governments, hospital management, medical professionals, and patients. Awareness of health care costs is essential to allow fair and effective rationing of medical resources.

Historically, medical professionals have been seen as "gatekeepers" of medical resources responsible for making "microallocation" decisions that give priority to one patient over another or ensure responsible cost-effective delivery of patient care. "Macroallocation" decisions involve broad policies to distribute resources over society and are generally made by administrative organizations, though frequently with input from medical professionals.

Contemporary ethicists point out that this gatekeeper notion is untenable, as it conflicts with the ethical responsibility of medical professionals to offer the best available medical care to the individual patient.[1] Because of this conflict between the individual and the collective, they advocate for collective solutions such as clinical guidelines that incorporate cost-effectiveness into clinical decision making and remove the practitioner from the gatekeeper responsibility.[1] Nevertheless, it is unlikely that there will ever be exhaustive clinical decision-making algorithms that acknowledge cost-effectiveness, and for this reason, the gatekeeper responsibility cannot be abandoned.

Opponents of health care rationing argue that the cost-containment problem could be addressed by eliminating waste—defined as health care expenditure that can be eliminated without reducing the quality of patient care.[2] In the United States, wastage has been estimated to account for 21% to 47% of total health care spending.[3] The authors are not aware of a similar analysis of the New Zealand health care system. Medical professionals contribute to wastage in the form of excessive testing, defensive medicine,

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poor understanding of the indications for tests and interventions, and lack of appreciation of costs and alternatives. A number of studies have shown where cost information is provided, practitioners modify behavior and reduce costs.[4-7]

Cost knowledge is fundamental to both microallocation and macroallocation decisions and to the effective function of the gatekeeper practitioner. Although evaluating the efficacy of medical interventions and diagnostic tests is a significant part of medical training, a number of studies from Europe and the United states have shown that physicians frequently have poor knowledge of the costs of these resources.[8,9] Allen and Lexchin[9] in a 2008 meta-analysis found that only 33% of cost estimates made by physicians were within ±25% of the true cost and that underestimates were most common.

No cost awareness studies have been undertaken in Australasia or specifically focusing on the surgical team. This study determined the cost of a range of commonly used diagnostic tests, procedures, and hospital resources associated with care of the surgical patient. The awareness of the surgical team of these costs was then assessed in a multicenter cross-sectional survey.

METHODS

Survey Population

New Zealand's National Ministry of Health is responsible for the oversight and funding of 20 district health boards (DHBs), which provide health services within their district. Public hospitals within New Zealand are funded in this way by the taxpayer. Individually, patients incur no out-of-pocket expenses for public hospital care. The private sector in New Zealand is funded by patients directly out of pocket, by private health insurance or occasionally through outsourcing from the public sector. Most New Zealanders depend on the public system, relatively few are privately insured and access care through the private system. Many general surgeons in New Zealand consult in both the public and private systems. The training of surgeons and junior physicians is confined to the public sector.

In total, 14 general surgical consultants, 14 registrars, and 25 house officers (junior physicians) working at three public hospitals within two adjacent DHBs (Bay of Plenty and Waikato) were surveyed. This included a spectrum of general surgical consultants involved in public practice alone or in both public and private practice. The only exclusion criterion was that the house officers must have completed at least three months experience on a general surgical run.

Survey Development and Data Collection

In Part 1 of this cross-sectional multicenter postal survey, respondents were asked to estimate the cost of 14 frequently encountered diagnostic tests, interventions, and hospital resources as decided by the two principal investigators (Table 3). Respondents were asked to estimate the total cost to the DHB, including staffing, clinical supplies, infrastructure, and outsourced costs. For estimates of procedures, the cost of the routine uncomplicated procedure was specified.

Part 2 of the survey asked respondents to rate their own accuracy and their perception of the importance of cost awareness in surgical practice. These responses were recorded on a five-point Likert scale.

The survey was distributed by the authors at departmental meetings over a period of six weeks. Return envelopes were included such that the survey could be completed and returned anonymously.

Determination of Actual Costs

True costs were defined by Bay of Plenty DHB's information department. All DHBs in New Zealand follow Ministry of Health National counting and costing standards as the methodology to calculate costs. These costs in our study included (unless stated otherwise) staffing, clinical supplies, infrastructure, and outsourced costs.

Data Analysis

Statistical analysis was undertaken with GraphPad prism (version 6, La Jolla, CA). The absolute percentage error [(true cost − estimate)/true cost × 100] was calculated for each estimate. The median absolute percentage error and minimum and maximum estimate for each item were calculated. To compare the accuracy of each group—consultants, registrars, and house officers—we calculated the mean absolute percentage error and 95% CI. The Kruskal-Wallace test was used to determine whether the mean absolute percentage error for each group varied significantly.

A subgroup analysis of consultants working in public practice alone vs consultants working in both public and private practice was undertaken. The median absolute percentage error and 95% CI were calculated for each group and compared using the Kruskal-Wallace test.

An estimate was determined as being "correct" if it fell within ±25% of the true cost, which is consistent with previous similar studies.[4] The frequency of correct estimates, underestimates, and overestimates was calculated for each group to examine whether there was a tendency to underestimate or overestimate.

RESULTS

In total, 57 surveys were completed. Of them, four were excluded from analysis because of missing demographic information and nine were incomplete containing missing cost