Surgeon-led Initiatives Cut Costs and Enhance the Quality of Endoscopic and Laparoscopic Procedures

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ABSTRACT

Background: Public perception depicts surgical cost control and quality of care as polar opposites. We describe a program led by practicing surgeons that demonstrates that quality can be maintained, and often improved, while substantial cost reductions are realized.

Methods: A set of evidence-based protocols was developed, revised, and followed for 42 procedures in general, otolaryngologic, urologic, and orthopedic surgery. Each protocol consists of surgeon-initiated guidelines on operative indications, preoperative testing, preadmission planning, length of stay, resource utilization, convalescence, and pharmacy services. Information was collected for 24 months from July 1998 to July 2000 by 62 surgeons in Kentucky and Indiana. Data were obtained for 4302 cases, among them colonoscopy (1145), esophagogastro-duodenoscopy (714), laparoscopic cholecystectomy (418), endoscopic retrograde cholangiopancreatography (235), and laparoscopic fundoplication (87).

Results: Specific cost reductions occurred in laparoscopic cholecystectomy by limiting the administration of peri-operative antibiotics. Sixty-seven percent of patients did not receive antibiotics. Outpatient cholecystectomy was the norm (60%), due primarily to preadmission planning through discussion with the patients and their family. Interestingly, when surgeons were educated on the costs of certain instruments and medications, their practices changed. The avoidance of a particular postoperative antiemetic, which was more than tenfold more expensive than other choices, was rapidly adopted by all surgeons when the costs were discovered. One participating teaching hospital used its own financial data and predicted that if all surgeons at their facility followed the protocols and had similar results, a savings of $1.1 million per quarter would be obtained.

Key Words: Surgeon-initiated guidelines, Resource utilization, Cost reductions.

INTRODUCTION

The desire to continually improve health care is global. The main areas of improvement have focused on cost control and accessibility. Progress lies in cost containment without losing quality of care. Before other areas of health care such as accessibility or availability can be advanced, the hyperinflation of medical care has to be contained. It is argued that defects in the current American operating health-care system are so severe that control of spending and implementation of change cannot occur without radical change.1 In fact, health-care reform has been a major platform in every United States presidential campaign since 1992.2

Financial stress of the rising costs of health care is coupled with decreasing third-party reimbursements. With the emergence of rapidly growing technology, such as advanced instruments and diagnostic tools, the potential costs of delivering “modern medical care” can be astronomical.

The rising cost of medications can also not be overstated. Hospitals have increasing expenses in updating equipment, acquiring innovative instruments, and adding newly released medications to their formulary. Decreased health-care reimbursement has affected all levels of patient care and can no longer defray these costs.3 This financial void affects both physicians and health-care institutions. Financial burdens have led to closure of some hospitals and left others in critical fiscal condition. Not coincidentally, an increasing shift is occurring from fee-for-service to managed-care medicine. Progressively tighter managed care continues to be the dominant form of health payment, but even its future is insecure.

Health maintenance organizations (HMOs) and managed care were spawned in the 1990s in response to the increasing cost of health care. Their origin can be traced...
to the beginning of the 20th century when mining, railroad, and lumber companies had organized their own medical care or exclusive contracts with health-care providers. Some evidence showed that prepaid providers could furnish comparable medical care at a lower cost; therefore, managed care programs began to expand. Many forms of managed care exist today, the most common and popular being a network model or one in association with an independent practice. This scenario accounts for about 70% of enrollment of managed-care participants. The quality of managed-care programs has received mixed reviews from both the physician and patient perspective. What managed care has introduced is the changing role of physicians from proprietor to employee. Physicians are now often evaluated on production in relation to spending. Financial incentives as well as contract renewal can depend largely on decreasing the cost of delivery. How a patient is treated now depends less on physicians’ judgment and more on what is allowed. “Corporate medicine” has created a threat to physicians’ medical autonomy.

A number of models have been proposed to financially restructure health care, including practice clinical guidelines, benchmark analysis, and reviews. The best and most appropriate way for managed-care plans and hospitals to control cost is to focus squarely on improving quality. The concept of cost-effective analysis has emerged to help battle the financial crisis by evaluating patient treatment and outcomes and analyzing cost and efficacy.

A formidable obstacle in restructuring is the implementation of change. It has been shown that physician-led efforts achieve the highest success and are more readily incorporated by clinicians. Based on these premises, Quality Surgical Solutions (QSS) was formed in January 1997. QSS is a network of independent surgeons in Kentucky who formed a professional limited liability corporation dedicated to improving the quality of surgical outcomes, while decreasing cost in the managed-care environment. QSS has since developed business relationships with regional hospitals and national insurance companies.

**METHODS**

Protocols were written for common general, otolaryngologic, urologic, and orthopedic surgical procedures. The protocols, known as “better practices,” were based on a review of the current medical literature and the experiences of the senior QSS surgeons on each committee. The protocols serve as practice guidelines and a basis for recommendations for patient care in preoperative testing, patient/family education and expectation, pharmacy, length of stay, home health, and return to work.

All members of QSS are owners of the company and are surgical specialists. Each member completes a reporting form after each protocol procedure that he or she performs. A fee is paid to the surgeon each time a completed report is submitted. The information gleaned from the reporting form is then entered into the large database for analysis. Reporting forms are randomly audited by office and hospital chart review on a regular basis. Patient satisfaction surveys also provide feedback.

**RESULTS**

Clinical data recorded since July 1, 1998 is ongoing. Through October 2000, 6514 procedures have been reported from 35 different categories including 3945 cases (61%) in laparoscopy and endoscopy (Figure 1).

Specific examples of cost reduction without compromise of patient care include limited use of antibiotics and disposable instruments in 624 laparoscopic cholecystec-

![Figure 1](image-url)
tomies. No consensus for use of preoperative antimicrobial prophylaxis exists for laparoscopic cholecystectomy.\textsuperscript{15-18} Based on protocol recommendations, the use of preoperative antibiotics was limited to patients with these specific criteria: (1) acute or subsiding acute cholecystitis; (2) known common duct bile stones; (3) age > 65 years; (4) preexisting prosthetic devices, especially cardiac valves; and (5) diabetes mellitus or recognized immunosuppression. Adherence to better practices resulted in a 62% reduction in preoperative antimicrobial use without an increase in observed infections.\textsuperscript{19}

Each surgeon’s preference for operating room instruments in common procedures like laparoscopic cholecystectomy was investigated. By simply reviewing preference cards, the use of disposable, reusable, and other associated laparoscopic instruments were analyzed. The sum total cost of the various tools/instruments ranged from $92.75 to $637.33 per surgical case, depending on the surgeon’s choice. Costly items were notably the disposable trocars, especially the 5-mm clip applier (Table 1). By encouraging surgeons to use reusable instruments, a sixfold reduction in cost for the hospital can be achieved.

Eighty-one percent of patients (n=87) who underwent laparoscopic fundoplication were discharged no later than the day after surgery. One feared complication of laparoscopic fundoplication is wrap disruption due to nausea and vomiting during the immediate postoperative period. Physicians do not agree about the superiority of antiemetics or brief nasogastric decompression in the first few hours after surgery. By reviewing hospital charges, we found that ondansetron is 50 times more expensive per dose than promethazine or prochlorperazine (> $100 vs $2.02 at our institution). By exposing the discrepancy in the cost of antiemetics, the surgeons and the hospital are able to save money by choosing the more cost-effective antiemetic. Through close periodic review of the literature as well as attending meetings for discussion, the physicians are able to keep up with the latest and most cost-effective treatments. For instance, when using the more expensive ondansetron, a lower dose is chosen based on studies showing no difference in efficacy between 1-, 4-, and 8-mg doses of ondansetron in the treatment of postoperative nausea and vomiting.\textsuperscript{20}

Colonoscopies (1711 total) were performed by surgeons during the study period. All but 29 were performed with the patient under conscious sedation. Of those who underwent general anesthesia, 19 had concurrent operations performed. Sixty-eight percent of the colonoscopy results were abnormal. On review of the financial data (provided by an insurance company), the fees charged by 1 group of surgeons was 3 times higher at 1 hospital than by the same group in a neighboring hospital. We discovered that 1 hospital required a certified registered nurse anesthetist (CRNA) to be present for all “conscious sedation” procedures, including colonoscopies. A review of the literature concerning safety of conscious sedation and the need for a CRNA was performed. No studies support the idea that conscious sedation performed by CRNAs is safer than when performed without them. Because the costly difference in hospital policy was not based on scientific fact, the CRNA requirement was subsequently lifted, saving money.

One participating hospital analyzed QSS vs non-QSS surgeons for 1 quarter of 1999. Surgeons who followed QSS protocols saved the hospital a significant amount of money. In fact, the hospital financial officer estimated that if all surgeons in their facility followed the protocols as the QSS surgeons did, the participating hospital would save $1.1 million per quarter (based on approximately 1000 cases per month).

**DISCUSSION**

A fixed number of health-care dollars exists in any delivery system. The data we present show that quality can be maintained (or improved upon) while costs are decreased by surgeon adherence to “better practices.” Although the immediate benefactors in cost-effective medicine are hospitals and insurance companies, we are hopeful that consuming less of the health-care dollars means that more money will be available in the future for providers.

| Table 1. Cost of Disposable Items |
|----------------------------------|
| 10- to 12-mm trocar | $59.88 |
| 5-mm trocar | $49.88 |
| Cholangiocatheter | $65.00 |
| Clip applier (10 mm) | $107.37 |
| Clip applier (5 mm) | $937.00 |
| Metz tips | $40.00 |
The most urgent and widespread problem in health care is cost containment. Only through sensible allocation of health-care capital can we address problems like access. It is important to understand that changes also affect the delivery and implementation of patient care, and that as a nation, we have only recently begun to analyze with more scrutiny the quality of health care delivered. The science of cost analysis has emerged to tackle the cost of the explosion of scientific advancement. QSS acts as an organizational unit that analyzes the cost-effective ratio by periodic examination of the medical literature and patient outcome. By weighing efficacy with expense, QSS helps conserve resources and funds to be allocated to areas in more need or improvement. Using practice guidelines in combination with communication and feedback of performance, surgeons are able to improve both the process and quality of care. The use of protocols has been shown to control cost as well as have a positive effect on patient outcomes.

Because QSS is made up entirely of surgeons, physicians have an active role in the changing management of patients. Many physicians feel that the practice of medicine has slipped from their control. Between 1983 and 1994, the number of physicians in solo practice has fallen from 41% to 29%, while physicians working as employees has risen from 24% to 43%. Case managers and other nonphysicians supervise clinical care in many institutions. They can question physicians about their clinical choices and limit the provision of medical services to the patient. By being an integral unit and heading the organization, physicians have an active role, thus shifting patient care back to the doctor. Surgeons can discuss their needs and the needs of their patients effectively and adapt protocols accordingly. In addition, having more institutions involved allows a larger resource to learn more cost-effective measures.

As pointed out by Traverso, attempts to reduce costs by nonmedical individuals will meet firm resistance and most likely decrease quality of care. Physician-led initiatives will be more readily accepted and lead to value, that is, decreased cost and maintenance or improvement in quality. Often, clinical practice guidelines do not convert to clinical practice, despite compelling evidence. Changing physicians' attitudes and habits is not a contemporary issue, and many methods for altering physicians' practices have been proposed. QSS utilizes multiple techniques, including education, feedback, and physician participation to bring about change. By having forums and meetings to introduce protocols, along with literature reviews, physicians are informed about optimal treatment and cost. QSS is an active entity for dissemination of information. One study involving 189 physicians showed that 80% believed that they were unaware of the actual cost of medications, with 55% giving inaccurate estimations.

Feedback gives physicians information on how their practices and patient management compare with that of their peers and the external standard. This is not meant to embarrass an individual, but only to promote education and optimal health-care delivery. Behavior theories suggest that one's behavior change is governed by one's goals or perceptions, which are, in turn, manipulated by internal and external forces.

Involvement of local leaders and senior surgeons has resulted in greater adherence to set practice guidelines. Local leaders and senior physicians head QSS as well as practicing surgeons. The influence of local medical leaders in the diffusion and adoption of clinical practice has long been recognized. Coleman et al studied the flow of information and how innovations were adopted and implemented. They concluded that interpersonal relationships among physicians were the most important factors in the adoption process. Weinrich and associates identified “education influentials” in 21 community hospitals in Michigan. It was found that physicians sought out their colleagues due to their position, personality, knowledge, influence, and interpersonal skills. Many had patterned their behavior practice after these influential leaders.

QSS is expanding its activities to surgeons, insurance companies, and hospitals outside of Kentucky. The protocols are constantly being updated based on the medical literature and group experience. With decreasing reimbursements and an ever-changing future for many medical institutions, a committee similar to QSS can aid in maintaining financial stability as well as optimal care for patients in nearly every area. The program is constantly being revised and improved as is any program in evolution. QSS is not a panacea for all the problems in health care, but it is a meaningful step toward resolution.

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