Chapter 13
Defining Quality of Care in Geriatric Surgery

Marcia L. McGory, Hiroko Kunitake, and Clifford Y. Ko

Introduction

Emphasis on Patient Safety and Quality of Care

Since the Institute of Medicine (IOM) reports *To Err is Human* and *Crossing the Quality Chasm* were released a great deal of attention has been focused on improving both patient safety and the quality of care. The IOM estimates that 98,000 people die per year in hospitals due to preventable medical errors, with higher error rates and more serious consequences occurring in intensive care units, operating rooms, and emergency departments [1, 2]. Surgeons not only care for patients in high-risk environments including intensive care units and operating rooms but also care for high-risk patients who may require a procedure under emergency circumstances or have multiple comorbid medical conditions. These patients are at the greatest risk for adverse outcomes and will likely have the largest benefit from improvements in the quality of health care. Elderly patients undergoing surgery are one example of such a population at risk and therefore attention has been focused on elderly surgical patients and the potential importance of geriatric surgery as a surgical specialty.

The IOM also recently addressed the health-care issues of our aging population through the Committee on the Future Healthcare Workforce for Older Americans in their 2008 report entitled *Retooling for an Aging America: Building the Healthcare Workforce* [3]. The committee proposed three mechanisms for improving the ability of our health-care system to care for older Americans: (1) Enhance the competence of all individuals in the delivery of geriatric care; (2) increase the recruitment and retention of geriatric specialists and caregivers; and (3) redesign models of care and broaden patient and provider roles to achieve greater flexibility. In addition, the committee noted that although general surgeons treat large numbers of older patients, there is no specific requirement for geriatric training or subspecialty certificate available in geriatric surgery. In contrast, there is a requirement for education in pediatrics within general surgery, as well as the subspecialty of pediatric surgery. The IOM recommendations are timely given the aging of the population and recent research efforts to improve the quality of care for elderly surgical patients.

Quality of Care Definitions

The conceptual framework driving quality improvement is based on the Donabedian model of quality evaluation, where care can be categorized into three types: structure, process, and outcomes [4]. As shown in Fig. 13.1, structural items are thought to influence both process and outcomes. Specifically, structural items include characteristics of the clinician (e.g., board certification), hospital (e.g., staffing patterns, procedure volume), and patients (e.g., insurance type, severity of comorbidities). Process items are the activities that occur between the patient and practitioner. Process refers to whether the medically appropriate decisions are made and whether care is provided in an effective and skillful manner. Outcomes data apply directly to patients and include mortality, morbidity, functional status, and quality of life. With respect to quality of care in geriatric surgery, examples of structural items include presence of a hospital ward designed for elderly patients or presence of a geriatric care coordinator. Examples of process items unique to geriatric surgery may include co-management of a geriatric surgery patient by a geriatrician or internist, and preoperative completion of a comprehensive geriatric assessment (CGA). Examples of outcomes unique to the geriatric surgery population may include postoperative delirium, change in functional status, and discharge to a skilled nursing facility.

M.L. McGory (✉)
Department of Surgery, David Geffen School of Medicine at the University of California, Los Angeles, CA, USA
e-mail: mmcgory@mednet.ucla.edu

R.A. Rosenthal et al. (eds.), *Principles and Practice of Geriatric Surgery*,
DOI 10.1007/978-1-4419-6999-6_13, © Springer Science+Business Media, LLC 2011

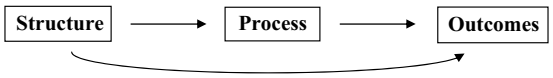

Figure 13.1 Donabedian model of quality of care.

The Impact of the Aging Population

The aging of the US population will place significant stress on the current health-care system. According to the US Census Bureau, in the last century the rate of growth of the elderly population (aged 65 and older) greatly exceeded the growth rate of the population as a whole. Between 1900 and 1994, while the total population tripled, the elderly population increased by a factor of 11. This rapid growth is expected to continue. In 2010, the elderly are predicted to account for 13% of the US population but by 2050 the elderly will comprise 20% of the US population. In addition, the elderly population is responsible for a disproportionate amount of health-care utilization and cost. According to the National Hospital Discharge Survey in 2006, patients aged 65 years and older contributed to 38% of hospital discharges and 43% of days of inpatient care [5].

The impact of the aging population has become especially apparent within the surgical disciplines. The field of surgery is undergoing a largely unrecognized paradigm shift due to the expanding and aging population in combination with an increasing emphasis on patient safety and quality of care. Patients aged 65 and older currently make up 60% of cases within general surgery and this is expected to increase 13% by 2010 and 31% by 2020 [6].The impact of the aging population will be even more significant in some of the surgical subspecialties. The proportion of work performed on patients aged 65 and older is highest for ophthalmology (88%), cardiothoracic surgery (70.3%), and urology (64.8%) [6]. The anticipated increases in the number and proportion of elderly surgical patients are likely due to multiple factors – not only has the elderly population increased in absolute numbers, but the threshold for performing surgery in the elderly has likely decreased with time [7]. These two factors will significantly increase the demand for surgical services and surgeons must develop strategies to maintain high quality care despite an increased and increasingly complex workload.

While the performance of the surgeon may largely be identical in the operating room with respect to surgical technique, there are a significant number of unique aging-related issues that must be addressed when caring for an elderly surgical patient. The potential needs of an elderly surgical population include increased attention to preoperative risk assessment, explicit communication with the patient and family regarding functional outcomes, and an emphasis on postoperative rehabilitation. The new focus on patient safety and quality no longer revolves solely around conventional surgical morbidity and mortality but probably should include the equally important issues of quality of life and return to preoperative level of functioning for the elderly surgical patient. The combination of these forces has created significant demand for the development of a new model for elderly surgical care which would improve efficiency and provide optimum care for this vulnerable population.

Unique Processes of Care and Outcomes in Geriatric Surgery

One of the first steps to improve the quality of care in geriatric surgery revolves around the concepts of preoperative assessment as well as prevention of perioperative complications. The comorbid disease burden is higher in elderly patients and in combination with decreased physiologic reserves requires closer attention to preoperative assessment and optimization of cardiovascular, pulmonary, renal, and endocrine status. Prevention of untoward events (e.g., infection, myocardial ischemia, delirium) should become the emphasis for this vulnerable population. In addition, preoperative assessment should not be limited to traditional comorbid disease but should extend to include geriatric issues such as cognitive impairment, malnutrition, risk of falls, and pressure ulcer development. Assessment of baseline functional, nutritional, and cognitive status will not only guide the perioperative care of the elderly patient but may influence patient–provider discussions regarding the aggressiveness of surgical intervention. Appropriate goals of surgery may range from palliation of malignant bowel obstruction to curative colorectal cancer resection. Further work is needed to identify processes of care unique to the geriatric surgery population that address preoperative assessment, optimization of comorbidities, and prevention of complications.

The second step to improve the quality of care in geriatric surgery may involve expanding the traditional outcome measures in surgery (e.g., morbidity and mortality) to include items that emphasize quality of life, functional outcomes and symptoms rather than solely prolongation of life. This move to identify such outcomes would highlight and emphasize the importance of these priority issues in the geriatric patient. The typical definition of postoperative morbidity might be expanded to include such postoperative events as episodes of postoperative delirium, in-hospital falls, development of pressure ulcers, and maintenance vs. decline of functional or cognitive status. One of the primary outcomes of interest after surgical intervention in the elderly population could also be return of the patient to their previous environment as well as their functional level prior to surgery. Therefore, the location of discharge after surgery (e.g., home vs. skilled nursing facility) as well as the functional status as measured

by activities of daily living (ADL), instrumental activities of daily living (IADL), or ambulation might be important to include as outcomes for the elderly patient undergoing surgery.

Potential Mechanisms for Improving the Quality of Elderly Surgical Care

The discipline of geriatrics is becoming an important part of the daily perioperative care of elderly patients on the surgical ward which has implications for how to restructure the surgical unit and train and teach both surgeons and other healthcare providers. A multitude of tools exist for restructuring surgical training and include involvement of the surgical boards and societies, pay-for-performance, the use of risk-adjusted outcomes, voluntary restructuring of the way we care for surgical patients, and feedback.

First, surgical boards and societies may need to become more directly involved with this paradigm shift. Similar changes have been performed in the field of Internal Medicine. The Residency Review Committee for Internal Medicine (RRC-IM) of the Accreditation Council for Graduate Medical Education (ACGME) recently proposed an outcomes-based accreditation strategy which shifts the emphasis from an external audit of education to a continuous assessment and improvement of the trainee's clinical competence [8]. The overarching goal of the change in the accreditation process of residency programs is to ensure that the emphasis on quality of care is also translated into quality of training [9]. Similar opportunities exist for surgical boards and societies to become leaders in this necessary paradigm shift. A partnership between the American College of Surgeons (ACS) and the American Geriatrics Society may help to address the necessary training and education issues of this intersection between the fields of geriatrics and surgery. Certainly, the Residency Review Committee (RRC) and ACGME are important in these endeavors as well. The ACS has already identified geriatric surgery as an important topic area through the development of a Geriatric Surgery Task Force, development of an online web portal with a geriatric surgery community, and identification of potential "geriatric-specific" variables for inclusion in the ACS National Surgery Quality Improvement Program (NSQIP) in order to help measure and improve the quality of care for geriatric surgery. More collaborative efforts of groups such as these are needed if we are to make headway with a paradigm shift toward the uniqueness, necessity, and importance specific to geriatric surgical care.

A second tool includes the potential use of incentivization for better care, or what is more commonly known as pay-for-performance. The Center for Medicare and Medicaid Services (CMS) is currently performing a Hospital Quality Incentive demonstration project utilizing widely accepted process and outcome measures for the conditions of acute myocardial infarction, heart failure, pneumonia, coronary artery bypass graft, and hip and knee replacement. Hospitals scoring in the top 10% for a given condition will receive a financial bonus while hospitals scoring in the second 10% receive a lesser bonus [10]. Potentially, Medicare could opt to reward hospitals for the presence of structural items such a geriatric care unit or process items such as adherence to geriatric surgery-related process measures (see below), or even outcomes. To date, many of the quality metrics in surgery are derived from the Surgical Care Improvement Project (SCIP), which has identified specific process measures related to surgical site infection, thromboembolism, cardiac complications, and ventilator associated pneumonia. What has been demonstrated is a substantial increase in process measure adherence – from around 40% adherence at the start of the project – to rates well above 80%, with many measures gaining adherence above 90%. Identifying important measures whether structural, process, or outcomes, goes a long way toward recognition and improvement.

A third tool includes the use of risk-adjusted outcomes. The current prototype for the assessment of risk-adjusted surgical outcomes is the Department of Veterans Affairs (VA) NSQIP, an ongoing quality improvement program that relies on the accurate and timely collection of prospective data by trained clinical nurse reviewers. The analysis of data within NSQIP provides the information necessary to create predictive models for morbidity and mortality for specific surgical procedures as well as compare the expected and observed numbers of deaths/complications across VA hospitals [11]. Since the inception of NSQIP in the mid-1990s, the 30-day mortality rate in the VA Medical Centers has decreased by 27% and the 30-day morbidity has decreased by 45%. These results demonstrate the usefulness of providing risk-adjusted outcomes as a benchmark, which assists with identification of areas for surgical quality improvement.[12]

Similarly, the ACS NSQIP has demonstrated that providing risk-adjusted outcomes also results in improvement in private sector hospitals. For example, an analysis of the most recent 3 years of data shows that 66% of hospitals were able to reduce their risk-adjusted mortality rates while 83% of hospitals reduced their risk-adjusted complication rates. Prior internal analyses by the ACS has also demonstrated interesting results regarding risk-adjusted outcomes in the elderly. While it is not surprising that the elderly had up to three times higher rates of complications and up to 20 times higher rates of mortality compared to nonelderly cohorts, it was interesting to note how the complications differed between the elderly and nonelderly. Specifically, the rates of surgical site infection, thromboembolism, postoperative bleeding, and return to the OR did not differ by age while the

elderly had significantly higher rates of acute myocardial infarctions, pneumonias, unplanned reintubations, urinary tract infections, and renal failure. These specific complications may lend themselves to identifying important processes of care to reduce these untoward events. Further stratification by age as part of the risk-adjustment analysis may also help identify procedures and age groups (e.g., octogenarians) with the most variability in morbidity and mortality which could potentially lead to large improvements in the outcomes of surgical procedures performed in the elderly [13].

A fourth option is a voluntary restructuring of the way we take care of surgical patients. In the traditional surgical model, surgeons often round on their patients twice a day while the nursing staff traditionally has been trained to a large degree to care for the technical aspects of the patient's post-op recovery. A new model for elderly surgical care may be required which incorporates more of a collaborative team approach with the integration of providers including surgeons, anesthesiologists, geriatricians, general internists, medical specialists, rehabilitation medicine, and nursing. Additional services will also play a critical role including physical/occupational therapists, nutritionists, and others. The team approach is central to the success of this model because the elderly surgical patient often brings a complex mix of both medical and surgical comorbid disease in addition to a variable level of functionality with respect to cognition, ambulation, and degree of independent self-care. Few, if any, single providers can give the optimal care needed for an elderly patient undergoing a major surgical procedure and completely address the interwoven issues of nutrition, cognition, rehabilitation, management of comorbid disease burden and postoperative surgical care. The prevention of postoperative delirium, for example, may include specialized nursing care with minimal use of restraints and specialized equipment for hearing or visual impairment. Physical and occupational therapy may start in the immediate postoperative period with specific goals set based on the results of the preoperative functional assessment. Specialized geriatric care units could increase the role for the elderly patient's family in the preoperative, in-hospital, and postdischarge aspects of care. Physicians should probably limit certain medications such as narcotics. Family assistance with self-care and rehabilitation while the elder is in the hospital can ultimately facilitate the discharge planning process and transition to home.

However, none of these options for implementation of a new model for elderly surgical care will likely be as successful without some sort of level of feedback mechanism (transparent or not) to return information to the providers and hospitals. The concept of quality improvement relies on the return of information to the provider so that outcomes are acknowledged (e.g., rates of postoperative delirium, percentage of patients with a change in functional status requiring discharge to a skilled nursing facility), improvements are noted and changes can be implemented.

Current Research on Geriatric Surgery Quality of Care

A review of the literature demonstrates multiple ongoing research efforts on the topic of geriatric surgery quality of care. Potential mechanisms for quality improvement include the use of quality indicators specific to geriatric surgery, preoperative assessment of geriatric surgery patients, co-management of these patients by geriatricians, a geriatric surgery consult service for nursing home patients and nursing programs focused on the needs of hospitalized elderly patients.

The first avenue of research to improve geriatric surgery quality of care is the development of quality indicators. Health-care regulatory agencies are now beginning to use quality indicators, defined as process measures that signify or result in higher quality, to measure quality of care. CMS and JCAHO are using quality indicators to evaluate care in nonsurgical diseases but the main reason for their lack of use in the surgical domain is that appropriate surgery-related quality indicators are still being developed. The quality of medical care for the elderly population has been the target of a significant amount of research through the RAND Health Assessing Care of Vulnerable Elders (ACOVE) project [14, 15]. The most recent update to the ACOVE project specifically identified quality indicators for elderly surgical patients including quality indicators for hospitalization and surgery in vulnerable elders [16] and quality indicators for the treatment of colorectal cancer in vulnerable elders [17].

In another effort to identify both necessary and important process measures that must be performed when taking care of an elderly surgical patient, McGory et al. gathered a twelve member expert panel consisting of physicians in surgery, geriatrics, anesthesia, internal medicine, pulmonary and critical care, and rehabilitation medicine to identify important processes of care for elderly patients undergoing major abdominal surgery [18]. The validity of the process measures was assessed using a modification of the RAND/UCLA Appropriateness Methodology [19–25]. Eighty-nine candidate indicators were identified and categorized into seven domains: comorbidity assessment (e.g., cardiopulmonary disease), elderly issues (e.g., cognition), medication use (e.g. polypharmacy), patient-to-provider discussions (e.g., life-sustaining preferences), intraoperative care (e.g., preventing hypothermia), Postoperative management (e.g., preventing delirium), and discharge planning (e.g., home health care). Of the 89 candidate indicators, 76 were rated as valid by the expert panel. Importantly, the majority of indicators rated as

valid address processes of care not routinely performed in younger surgical populations (Table 13.1). Currently, with support from the National Institute on Aging, this research group is attempting to identify process measures that are applicable to all of inpatient elderly surgery (rather than just major abdominal surgery) in addition to elderly specific structure and outcome measures.

A second avenue of research involves the comprehensive preoperative assessment of elderly surgical patients. The preoperative assessment in elderly cancer patients (PACE) was a prospective study of patients 70 years and older undergoing elective cancer surgery [26]. PACE components included a mini-mental state exam (MMSE), ADLs, IADLs, Geriatric Depression Scale (GDS), brief fatigue inventory (BFI), performance status, American Society of Anesthesiology Scale (ASA), and Satariano's index of comorbidities (SIC). Multivariate analysis demonstrated that IADL, BFI, and ASA were the most important components of PACE to explain postsurgical complications. Further work is needed to determine if PACE can predict postoperative outcomes including length of stay, morbidity, and mortality. Similarly, Harari et al. evaluated proactive care of older people undergoing

Table 13.1 Process measures unique to the elderly undergoing surgery vs. perioperative care items universal to all surgical patients

Domain of care	Process measures unique to elderly undergoing surgery	Process measures universal to all surgical patients
Comorbidity assessment	Complete standardized cardiovascular risk evaluation per ACC/AHA guidelines Estimation of creatinine clearance	Standardized preoperative lab panel Pulmonary physical exam/review of systems Obtain history of diabetes Assess use of tobacco/alcohol Smoking cessation
Evaluation of elderly issues	Screen for nutrition, cognition, delirium risk, pressure ulcer risk Assess functional status including ambulation, vision/hearing impairment, and ADLs/IADLs Referral for further evaluation for impaired cognition or functional status, high risk for delirium, or polypharmacy	Not applicable
Medication use	Indications for inpatient bowel preparation Evaluation of medication regimen and polypharmacy Avoid delirium-triggering medications and other potentially inappropriate medications (e.g., Beers criteria)	Instruction on preoperative medication management Perioperative beta blockade Intravenous antibiotic prophylaxis Endocarditis prophylaxis Deep venous thrombosis prophylaxis
Patient–provider discussions	Assess patient's decision-making capacity Specific discussion on expected functional outcome, life-sustaining preferences, and surrogate decision maker	Informed consent about treatment options, and risks/benefits of surgery Treatment preferences (e.g., do not resuscitate) should be followed
Intraoperative care	Not applicable	Prevent hypothermia Proper positioning
Postoperative management	Prevent malnutrition, delirium, deconditioning, pressure ulcers Daily screen for postoperative delirium and standardized workup for delirium episode Make staff aware if hearing/vision impairment Patient access to glasses, hearing aid, dentures Consider home health for assistance for ostomy care Infection prevention with daily assessment of central line and indication for use, early foley catheter removal, and standardized fever workup	Appropriate restraint use Measure daily input/output Aspiration precautions Use of incentive spirometer Use of translator or interpreted materials for deaf or non-English speaking Education about ostomy self-care Pain assessment with each set of vital signs
Discharge planning	A discussion with the patient or caretaker about purpose of drug, how to take it, and expected side effects/adverse effects for all medications prescribed for outpatient use Assess social support and need for home health prior to surgery Assess nutrition, cognition, ambulation, and ADLs prior to discharge	A complete list of medications and dosages to continue upon discharge from the hospital Assess need for medical equipment, home health, skilled nursing facility prior to discharge Written and oral discharge instructions Discharge summary to indicate follow-up labs, tests, appointments Follow-up visit within 6 weeks Communication to primary-care doctor

Source: Reprinted with permission from [17]. Copyright Elsevier 2005

elective surgery (POPS), a CGA service for older elective surgical patients [27]. The POPS team consisted of a geriatrician, geriatric nurse specialist, physical and occupational therapists, and social worker. The preoperative assessment included the abbreviated mental test score, GDS, Barthel index, timed up and go, 180° degree run, body mass index, continence screen, orthostatic blood pressure, numeric pain score, and peak expiratory flow rate. A comparison of outcomes before and after the POPS intervention revealed significantly decreased rates of delirium, pneumonia, wound infection, uncontrolled pain, presence of a urinary catheter for more than 4 days without indication, pressure sores, bedridden patients, and length of stay.

A third avenue of research is the use of a dedicated geriatric service for the co-management of geriatric surgery patients. Friedman et al. evaluated the outcomes of a geriatric fracture center co-managed by orthopedic surgeons and geriatricians [28]. The principles of the geriatric fracture center included the following: (1) most patients benefit from surgical stabilization of the fracture; (2) timely surgical intervention decreases the time in the hospital for development of iatrogenic illness; (3) co-management and frequent communication between the orthopedic surgery and geriatric teams decreases iatrogenesis; (4) standardized protocols decrease variability in care; and (5) discharge planning starts at the time of admission. During a 1-year time period, the geriatric fracture center managed 195 patients. The average time to the operating room was 24.1 h, length of stay was 4.6 days (expected length of stay was 5.2 days using a large healthcare database that determined expected outcomes while adjusting for patient characteristics), readmission within 30 days was 9.7% (expected 19.4%), and in-hospital mortality was 1.5% (expected 3.2%). Similarly, Fallon et al. evaluated the outcomes of geriatric trauma patients when evaluated by a geriatrician within 24 h of admission [29]. A standardized geriatric trauma consultation was utilized which included the following components: demographics, clinical information (e.g., trauma mechanism, primary and secondary diagnoses), physical function (e.g., ADLs, ability to ambulate), cognitive function (e.g., orientation-memory concentration exam, MMSE, confusion assessment method), mood (e.g., geriatric depression scale), medications (focus on potentially inappropriate medication), and pain control. In addition to providing input on geriatric trauma patient management, the geriatric trauma team participated in weekly multidisciplinary rounds as well as monthly performance improvement meetings. During a 1-year time period, 114 out of 285 geriatric trauma patients were seen in consultation by the geriatric trauma team. The most common issues addressed by the geriatricians were pain control, rehabilitation, delirium/dementia, hypertension, and decreased use of adverse drugs. The geriatric trauma patients seen by geriatricians had higher rates of discharge to rehabilitation and a statistically significant lower mortality rate (4% vs. 18%). Both of these studies clearly demonstrate the benefits of geriatric assessment and co-management for two diverse patient populations (hip fracture and trauma) suggesting that routine geriatric co-management should be an essential component of improving the quality of care in geriatric surgery.

A fourth avenue of research is the use of a geriatric surgery consult service for frail nursing home patients requiring surgical intervention. This model was evaluated by Zenilman et al. [30]. Maintenance surgical care included monitoring of pressure ulcers, stomas, and enteral feeding tubes. However, abdominal, breast, and vascular disease were also commonly treated. The goals and indications of consultation for surgical intervention in an elderly patient vary widely and must be explicitly stated. The goals of surgery could potentially range from palliation to curative resection. Common procedures such as placement of a feeding tube may be secondary to severe malnutrition, cognitive decline (severe dementia), or loss of the ability to care and feed oneself. In addition, many procedures such as those relating to access (e.g., enteral, vascular) or wound care may be chronic in nature. The success of a geriatric surgery consult service depends on the ability to focus on the patient's goals for treatment rather than solely on a surgical cure.

Finally, a fifth avenue of research is the development of a nursing program that specifically addresses the needs of hospitalized geriatric patients. Nurses Improving Care for HealthSystem Elders (NICHE) was developed through the Hartford Institute for Geriatric Nursing at New York University College of Nursing. Components of NICHE include a geriatric institutional assessment profile, staff development tools, nursing care models (e.g., use of a geriatric resource nurse and acute care of the elderly unit model), and research-based clinical protocols (e.g., improving detection and management of delirium). Boltz et al. evaluated the changes in the geriatric care environment associated with NICHE in a sample of eight acute care hospitals in the USA [31]. After NICHE implementation, both perceptions of the geriatric nursing practice environment by nurses and the quality of geriatric care increased. This research is vitally important because of the important role of nurses as part of the team approach to delivering high quality geriatric care.

Conclusion

Just as pediatric surgery became a specialty unto itself, the expanding and aging population has created a potential niche for the specialty of geriatric surgery at the opposite end of the age spectrum. The field of geriatric surgery may indicate a focus on elderly patients for the surgeon, but more importantly the specialty of geriatric surgery represents a

collaboration between surgeons, geriatricians, internists, and many other health-care providers who together will address the complex interdisciplinary issues unique to the growing elderly surgical patient population. A great deal of effort is currently being spent on the means of improving the quality of care for geriatric surgery patients through the process measures of developing appropriate quality indicators, improving preoperative assessments and collaboration between surgeons and geriatricians in novel ways such as co-management of elderly surgical patients and surgical consult services in nursing homes. However, to evaluate the quality of care for these elderly surgical patients we must have quality metrics. One possibility is to use adherence to process measures as representative of quality. However, adherence to these process measures may not correlate well with the outcomes of lower morbidity and mortality and improved quality of life which are the ultimate goals of the patient and providers.

Another option is to use outcomes to measure quality – the question becomes which outcomes should we employ to evaluate the quality of elderly surgical care? Should we use traditional outcomes such as mortality and complications or patient reported items such as quality of life and functional status? An important limitation to the use of any quality metric is the ability to measure the quality metric. Some outcomes such as mortality are easily quantified and measured while others such as quality of life are difficult to define and evaluate. And with all quality measures, are there potential unintended consequences to their use as a quality measure? If we decide to use urinary tract infection as a quality measure, is everyone then required to have a urinalysis or urine culture to ensure there is no urinary tract infection? Finally, when we decide on our quality measures, who will be held responsible for the quality of care – the surgeon, the geriatrician, or one of the many other members of the team caring for the elderly surgical patient? Certainly, there are a number of issues to address with the use of quality metrics, but progress in evaluating and improving geriatric surgical care should not be stalled.

Defining quality of care in geriatric surgery is an evolving process with many yet unresolved issues. However as increasing attention and effort is focused on the growing population of elderly surgical patients, we will better understand how to improve and define the quality of surgical care for this unique patient group.

References

1. Kohn LT, Corrigan JM, Donaldson MS. To err is human: building a safer health system. National Academy Press, Washington, DC
2. Institute of Medicine (2001) Crossing the quality chasm, a new health system for the 21st Century. National Academy Press, Washington, DC
3. Institute of Medicine (2008) Retooling for an Aging America: building the healthcare workforce. National Academy Press, Washington, DC
4. Donabedian A (1980) The definition of quality and approaches to its assessment, vol 1. Health Administration Press, Washington, DC, pp 163
5. DeFrances CJ, Lucas CA Buie VC Golosinskiy A. National Health Statistics Reports: 2006 National Hospital Discharge Survey. http://www.cdc.gov/nchs/data/nhsr/nhsr005.pdf. Accessed 7 June 2009
6. Etzioni DA, Liu JH, Maggard MA, Ko CY (2003) The aging population and its impact on the surgery workforce. Ann Surg 238:170–177
7. Etzioni DA, Liu JH, O'Connell JB, Maggard MA, Ko CY (2003) Elderly patients in surgical workloads: a population-based analysis. Am Surg 69:961–965
8. Goroll AH, Sirio C, Duffy FD, LeBlond RF, Alguire P, Blackwell TA et al (2004) A new model for accreditation of residency programs in internal medicine. Ann Intern Med 140:902–909
9. Cassel CK (2004) Quality of care and quality of training: a shared vision for internal medicine? Ann Intern Med 140:927–928
10. Medicare pay-for-performance demonstration shows significant quality of care improvement at participating hospitals. http://www.cms.hhs.gov/media/press/release.asp?Counter=1441. Accessed 13 May 2005
11. Khuri SF, Daley J, Henderson W, Hur K, Demakis J, Aust JB et al (1998) The Department of Veterans Affairs' NSQIP: the first national, validated, outcome-based, risk-adjusted, and peer-controlled program for the measurement and enhancement of the quality of surgical care. National VA Surgical Quality Improvement Program. Ann Surg 228:491–507
12. Khuri SF, Daley J, Henderson WG (2002) The comparative assessment and improvement of quality of surgical care in the Department of Veterans Affairs. Arch Surg 137:20–27
13. Hamel MB, Henderson WG, Khuri SF, Daley J (2005) Surgical outcomes for patients aged 80 and older: morbidity and mortality from major noncardiac surgery. J Am Geriatr Soc 53:424–429
14. Wenger NS, Shekelle PG (2001) Assessing care of vulnerable elders: ACOVE project overview. Ann Intern Med 135:642–646
15. Shekelle PG, MacLean CH, Morton SC, Wenger NS (2001) Assessing care of vulnerable elders: methods for developing quality indicators. Ann Intern Med 135:647–652
16. Arora VM, McGory ML, Fung CH (2007) Quality indicators for hospitalization and surgery in vulnerable elders. J Am Geriatr Soc 55(Suppl 2):S347–S358
17. McGory ML (2007) Quality indicators for the care of colorectal cancer in vulnerable elders. J Am Geriatr Soc 55(Suppl 2): S277–S284
18. McGory ML, Shekelle PG, Rubenstein LZ, Fink A, Ko CY (2005) Developing quality indicators for elderly patients undergoing abdominal surgery. J Am Coll Surg 201(6):870–883
19. Brook RH (1994) "The RAND/UCLA appropriateness method," clinical practice guideline development: methodology perspectives. Public Health Service: AHCR, Rockville, MD
20. Hemingway H, Crook AM, Feder G, Banerjee S, Dawson JR, Magee P et al (2001) Underuse of coronary revascularization procedures in patients considered appropriate candidates for revascularization. N Engl J Med 344:645–654
21. Kravitz RL, Laouri M, Kahan JP, Guzy P, Sherman T, Hilborne L et al (1995) Validity of criteria used for detecting underuse of coronary revascularization. J Am Med Soc 274:632–638
22. Merrick NJ, Fink A, Park RE, Brook RH, Kosecoff J, Chassin MR et al (1987) Derivation of clinical indications for carotid endarterectomy by an expert panel. Am J Public Health 77:187–190
23. Shekelle P (2004) The appropriateness method. Med Decis Making 24:228–231

24. Shekelle PG (2001) Are appropriateness criteria ready for use in clinical practice? N Engl J Med 344:677–678
25. Higashi T, Shekelle PG, Adams JL et al (2004) Vulnerable older patients receiving higher quality medical care have lower mortality. J Gen Intern Med 19:236
26. Audisio RA, Pope D, Ramesh HS, Gennari R, van Leeuwen BL, West C et al (2008) Shall we operate? Preoperative assessment in elderly cancer patients (PACE) can help. A SIOG surgical task force prospective study. Crit Rev Oncol Hematol 65:156–163
27. Harari D, Hopper A, Dhesi J, Babic-Illman G, Lockwood L, Martin F (2007) Proactive care of older people undergoing surgery ('POPS'): designing, embedding, evaluating and funding a comprehensive geriatric assessment service for older elective surgical patients. Age Ageing 36:190–196
28. Friedman SM, Mendelson DA, Kates SL, McCann RM (2008) Geriatric co-management of proximal femur fractures: total quality management and protocol-driven care result in better outcomes for a frail patient population. J Am Geriatr Soc 56:1349–1356
29. Fallon WF Jr, Rader E, Zyzanski S, Mancuso C, Martin B, Breedlove L et al (2006) Geriatric outcomes are improved by a geriatric trauma consultation service. J Trauma 61:1040–1046
30. Zenilman ME, Bender JS, Magnuson TH, Smith GW (1996) General surgical care in the nursing home patient: results of a dedicated geriatric surgery consult service. J Am Coll Surg 183:361–370
31. Boltz M, Capezuti E, Bowar-Ferres S, Norman R, Secic M, Kim H et al (2008) Changes in the geriatric care environment associated with NICHE (Nurses Improving Care for HealthSystem Elders). Geriatr Nurs 29:176–185