



3.1 Introduction

The COVID pandemic notwithstanding, the greatest force affecting health care in our lifetime is the aging of the population. The growth in population is especially evident in the growth of numbers of the “oldest old,” that is, those over 85 years. It is rare for a surgeon not to encounter the “oldest old” as part of his or her practice spectrum. This is paralleled by an increase in conditions commonly found in older patients (e.g., atherosclerosis, diabetes, hypertension, degenerative joint disease, age-related macular degeneration and cataracts, and cancer).

Some health-care facilities have shown impressive outcomes for surgery in the geriatric population, outcomes similar to those in the general population. Remarkably, these similar outcomes have even been seen in complex surgical procedures such as aortic arch replacement [1], pancreaticoduodenectomy [2], gastrectomy [3], hepatectomy [4], and esophagectomy [5, 6]. But even more importantly, there is overwhelming evidence that quality of life can be maintained or improved following surgery [7–10].

However, despite the encouraging nature of these results, age remains an independent risk factor for postoperative morbidity [11, 12] and mortality [13]. Finlayson [14] found increased operative mortality in 70 and 80 year olds undergoing high-risk cancer operations. This result is emulated in a study of 30,900 colorectal resections in the National Surgery Quality Improvement Program (NSQIP) database [15]. Postoperative complications are sometimes higher and postoperative length of stay is often longer than that in younger patients [16, 17]. These results remind us there is continued room for quality improvement, a large part of which entails preoperative care uniquely fitted to the needs of geriatric surgical patients.

Perioperative evaluation entails multiple components for a detailed comprehensive preoperative evaluation, permits more informed decision-making in recommending a certain surgery, encourages modification of a procedure to an individual patient’s needs, and provides critical information regarding a patient’s preoperative baseline to the team caring for a patient postoperatively. Thus, it is important to view the patient as an individual, with decisions based on functional rather than chronologic age alone.

Much literature has been published regarding “best” preoperative care for the older patient. Unfortunately no single, perfect, comprehensive validated assessment has been found. The Holy Grail of Geriatric Surgery [18] would be a simple, reliable test to assess perioperative risk in a geriatric patient. As the number of surgeries performed on older adults increases, a greater understanding of the unique needs of individual older surgical candidates will develop. Further, this allows expansion and improvement of well-vetted best practice guidelines to optimize preoperative geriatric care.

3.2 The ACS/AGS Best Practice Guidelines

Recognizing the unique needs of the aging surgical populace, the American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP) and the American Geriatrics Society (AGS) partnered to construct best practices guidelines focused on perioperative care of the geriatric surgical patient. A 21-member, multidisciplinary included the ACS Geriatric Surgery Task Force, 14 medical centers, and experts from multiple surgical subspecialties such as urology, colorectal surgery, endocrine surgery, advanced laparoscopic surgery, surgical oncology, anesthesiology, and geriatric medicine.

A focused, structured literature review (using PubMed) identified clinical trials, practice guidelines, systemic reviews, and meta-analyses published over the last decade. The expert panel reviewed the publications based on strength of evidence, relevance to geriatric patients, endorsement by

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professional associations, and most recent publications. With the initial search yielding 25,978 citations, a total of 5879 abstracts were screened and ultimately 309 publications chosen as appropriate for the study purposes. The final guidelines summarize evidence-based recommendations for improving preoperative assessment of geriatric patients [19].

Understanding the highlights of a comprehensive perioperative geriatric assessment is essential in providing quality care to the older surgical patient.

3.3 Assessing Cognitive Ability and Capacity to Understand

It is important that a patient understand the risks, benefits, and alternatives to surgery before any procedure. A physician must confirm that a patient is able to delineate in their own words basic understanding of a proposed surgical intervention. Legally based criteria to demonstrate decision-making capacity include: (1) the patient can clearly indicate his or her treatment choice; (2) the patient understands the relevant information communicated by the physician; (3) the patient acknowledges his or her medical condition, treatment options, and the likely outcomes; and (4) the patient can engage in a rational discussion about the treatment options [20].

Screening for mild cognitive impairment preoperatively in a patient without known cognitive impairment may identify patients at risk for postoperative complications. For a patient without a known history of mental decline, it is recommended to obtain a detailed history and perform a cognitive assessment, such as the Mini-Cog [21]. If cognitive impairment is suspected, referral to a geriatrician or primary care provider should be considered for further work up. It is critical to document a patient's preoperative cognitive exam as it is often difficult to assess postoperative cognitive impairment without an accurate preoperative baseline.

As Americans are living longer, the proportion showing signs of cognitive impairment and dementia has dramatically increased, especially in those over age 60 [22]. Preexisting cognitive impairment is not only associated with postoperative delirium [23, 24], but also perioperative mortality risk [25], longer hospital stays, and functional decline [26].

3.4 Screening for Depression

Depression in the elderly is not uncommon with major depression found in approximately 1–3% with 8–16% showing clinically significant depressive symptoms [27]. Patients with depression have been shown to have a greater level of

pain and, in turn, require more postoperative analgesia [28]. Risk factors for depression among geriatric patients include bereavement, female sex, disability, sleep disturbance, and a history of depression. Poor health, living alone, and cognitive impairment have been associated with a higher likelihood of depression [29].

A simple screening test for depression is the Patient Health Questionnaire-225 [30]. Asking: (1) “In the last year, have you ever felt sad, blue, depressed or down for most of the time for at least 2 weeks?” (2) “In the last year, have you ever had a time, lasting at least 2 weeks, when you didn't care or enjoy the things you usually do?” If “yes” is answered to either question, then further evaluation is recommended. It is important to note that the PHQ-2 has not been validated in unique circumstances such as patients with severe medical illnesses and impaired communications skills or frail elderly patients.

See chapters on Psychiatry and Tools of Assessment for additional information on screening for depression.

3.5 Screening for Postoperative Delirium Risk Factors

Delirium may be the most common postoperative complication in the older surgical population. The incidence of postoperative delirium cited in literature ranges widely, studies citing from 5.1% to 52.2% [31]. The two strongest predisposing factors for delirium are preexisting cognitive impairment and dementia [32]. Further risk factors that should be considered preoperatively include substance abuse, depression, impaired hearing or vision, polypharmacy, and poor overall functional status.

Postoperative delirium is associated with many complications including greater mortality, decreased functional recovery, longer hospital stay, and higher chance of posthospitalization institutionalization [23, 25, 26, 31, 33, 34]. Some studies conclude, however, that up to 40% of postoperative delirium in older, hospitalized adults is preventable [35, 36]. Hence, it is critical to understand a patient's risk factors for delirium and institute evidence-based interventions [37].

See chapter on Delirium for in depth discussion of delirium.

3.6 Screening for Alcohol or Substance Abuse

Alcohol abuse is fairly common in the elderly population. Blazer et al. found 15.4% of community-dwelling individuals aged >65 years to show signs of alcohol abuse [38].

Preoperative alcohol abuse and dependence are associated with increased rates of postoperative complications such as wound infection, pneumonia, and sepsis [39, 40].

All patients should be screened for alcohol and substance abuse and if a patient answers “yes” to any of the CAGE questions [41], perioperative prophylaxis for withdrawal syndromes should be considered. In non-emergent surgeries, one should highly consider sending motivated patients to substance abuse specialists [42]. Patients with alcohol use disorder may benefit from receiving perioperative vitamin B12, folic acid, thiamine and other vitamin supplementation [19].

3.7 Cardiac and Pulmonary Evaluation

Adverse cardiac outcomes have a higher probability of occurring in older patients [43]. In noncardiac surgery patients Lee et al. found a 2% risk of perioperative cardiac complications [44]. For patients with or at risk of cardiac disease, Devereaux et al. found a 3.9% risk for cardiac complications [45] a rate almost double for high-risk cardiac patients. It is important to risk stratify patients to identify those with an increased chance of cardiac complications to provide appropriate perioperative management by anesthesia and surgeons as well to clearly delineate operative risk to the patient and their family.

The American College of Cardiology and the American Heart Association (ACC/AHA) recommend completing a perioperative cardiac risk assessment on everyone using the ACC/AHA algorithm for noncardiac surgery to help establish perioperative cardiac risk in noncardiac surgery patients (complete version are available at ACC/AHA websites).

Postoperative pulmonary complications are not uncommon and affect postoperative morbidity and mortality in the older patient [46]. In noncardiac surgery patients, postoperative pulmonary complications average 6.8% increasing to 15% in those over age 70 [47]. The *ACS NSQIP Best Practices Guidelines: Prevention of Postoperative Pulmonary Complications* delineates postoperative pulmonary complication risk factors as patient-related and surgery-related factors. Of note, obesity, well-controlled asthma, and diabetes were not considered risk factors.

Strategies to prevent postoperative pulmonary complications include perioperative pulmonary function testing in patients with uncontrolled COPD and asthma, smoking cessation, and perioperative incentive spirometer instruction and usage [48]. In select patients, chest radiography and pulmonary function tests may also be helpful [48, 49]. Chapters on Pulmonary and Critical Care Medicine provide details of assessing the pulmonary status.

3.8 Functional Status, Mobility, and Fall Risk

Consideration of functional status, mobility, and fall risk in a geriatric patient are critical. Functional dependence was the strongest predictor of postoperative 6-month mortality in a prospective review of older patients who underwent major surgery [50]. Impaired mobility in elderly surgical patients has also been associated with increased postoperative delirium [31, 51].

Patients should have their functional status evaluated by assessing their capability to carry out activities of daily living (ADL). A simple screening test includes four questions: (1) “Can you get out of bed or chair by yourself?” (2) “Can you dress and bathe yourself?” (3) “Can you make your own meals?,” and (4). “Can you do your own shopping (e.g., for food or at the mall)?” [49]. If a patient answers “no” to any of these questions then further evaluation should be contemplated. An assessment of formal ADLs and instrumental ADLs can also be performed [52]. It is important to document any identified functional limitations and referral to occupational and/or physical therapy [53]. Particular attention should be paid to possible deficits in hearing, vision, or swallowing as these can impact postoperative recovery. Hearing deficits can affect postoperative delirium, falls, and communication. Gait and mobility can easily be tested using the Timed Up and Go Test (TUGT) [54]. Patients having a difficult time rising from a chair or necessitating more than 15 s to finish the test are at a greater risk of falling. Communication with all members of the team caring for the patient is critical along with instituting preventive measures whenever any of these deficits are identified. See chapter on Tools of Assessment for a discussion of tools available to assess functional status.

3.9 Frailty

Frailty is a condition characterized by decreased physiologic reserve and vulnerability to stressors, leaving patients with a higher likelihood of experiencing unfortunate outcomes such as a decrease in mobility. In the worst case scenario, it may be coupled with frequent hospitalizations, need for higher level of care, and often untimely death. Fried and colleagues developed a five-point phenotypic scale for assessing frailty [55]. This was validated by Makary and associates specifically in older surgical patients. Makary et al. demonstrated frailty to independently predict increased postoperative adverse events and an increased chance of discharge to an assisted living facility [56]. We are still learning about how to optimally assess frailty and its clinical impact. The chapter on Frailty provides a thorough discussion of this condition.

3.10 Nutrition Assessment

Rates of malnutrition in elderly communities are surprisingly high. Estimates rate malnutrition for elderly in the community at 5.8%, nursing homes at 13.8%, hospitals at 38.7%, and rehabilitation at 50.5% [57]. Poor nutrition is associated with infectious complications such as surgical site infections, wound dehiscence, and anastomotic leaks [58].

A nutritional status screen should include documentation of height and weight and calculation of body mass index. A patient should be asked about any unintentional weight loss in the last year. Obtaining a baseline serum albumin and pre-albumin level may also be considered.

Nutritional risk should be considered if a patient has a serum albumin <3.0 g/dL (without hepatic or renal involvement), BMI <18.5 kg/m², or any inadvertent weight loss of 10% to 15% over the past 6 months [59]. Referral to a dietician should be considered for individuals identified at risk for poor nutrition to develop a plan for “preoperative nutritional support.” If this is not feasible it may be helpful to prescribe nutritional supplements when preparing for surgery. The European Society for Clinical Nutrition and Metabolism (ESPEN) summarizes recommendations regarding nutritional support [59, 60].

The chapter on Tools of Assessment provides more details on assessing nutrition status.

3.11 Medication Assessment

Elderly patients are at a high risk for incurring side effects from drugs. Older patients are sensitive to psychoactive effects of medications, especially those often used in the perioperative time period. Narcotics and benzodiazepines may be the cause of postoperative delirium. Chronic kidney disease and impaired renal function are also common in the older population. Ensuring renal dosing of medications is essential to prevent adverse drug side effects. Medication doses should be adjusted for renal function based on glomerular filtration rate (GFR) and not on serum creatinine alone.

Polypharmacy is common in the geriatric population as they have a greater burden of illnesses and disease. Polypharmacy is not only associated with adverse drug reactions but also greater risk of cognitive impairment and mortality [61]. When possible, nonessential medications should be discontinued preoperatively and the addition of new medications should be kept to a minimum [62].

It is essential for medication lists to be reviewed, reconciled, and documented including nonprescription pharmaceuticals such as vitamins, topical agents, herbal supplements, or nonsteroidal anti-inflammatory agents [62]. This review can identify medications that should be discontinued or

dose-altered prior to surgery. The American Geriatric Society (AGS) Updated Beers Criteria for Potentially Inappropriate Medication Use in Older Adults provides peer reviewed guidelines regarding medications that should be avoided in the older population.

Conversely, it is necessary to continue those medications that are shown to reduce perioperative adverse events such as heart attack and stroke. Following the most current ACC/AHA guidelines for perioperative beta blockers and statins is also essential [63–65].

The chapter on Medication Management provides a detailed discussion of this subject.

3.12 Patient and Family Counseling

Over the last decade many more people, including the elderly, are completing advance directives. Without advance directives, physicians rely on health-care proxies to make end-of-life decisions for patients. Unfortunately, many never discuss their preferences with their next of kin. Studies also show family members, surrogates, and physicians often fail to accurately predict patients’ treatment preferences [66, 67].

It is strongly recommended that as part of preoperative planning a surgeon review if the patient has an advanced directive such as a living will or a durable power of attorney for health care. It is also imperative that a surgeon clearly communicate treatment goals, the expected postoperative course, and any potential complications in words that a patient understands. Incorporating the appropriate health, language, and educational literacy (along with any written or audiovisual aids for explanation) is paramount in helping the patient and their family/social support system understand the risk and benefits of the proposed surgery. Having the patient along with his family at the same discussions can often be helpful as it allows everyone to hear the same information [68].

Taking the time to understand a patient’s family/caregiver and support network can also be beneficial when considering the patient’s discharge disposition. Referral to a social worker or case manager should be made if there is concern for inadequate family or social support.

3.13 Preoperative Testing and Imaging

Preoperative screening tests indicated in the geriatric surgical population include hemoglobin, albumin, and renal function tests [19]. Hemoglobin assessment is important in suspected or known cases of anemia and in surgeries anticipating a large amount of blood loss [69]. Renal function tests are necessary to assess for clearance of any medications (anesthetics, antibiotics, etc.) and as a baseline in patients

taking medications that affect renal function such as angiotensin-converting enzyme inhibitors or NSAIDs [70, 71]. Measurement of serum albumin is particularly helpful in patients with multiple chronic conditions, like liver disease and those with malnutrition.

In specific geriatric surgical patients other preoperative laboratory tests that are helpful include white blood cell count, electrolytes, and coagulation tests. White blood cell count is helpful in cases of suspected infection or patients at high risk for leukopenia secondary to illness or drugs. Electrolyte studies (e.g., Na, K, Cl, CO₂) are important not only in patients with renal insufficiency but also in patients taking diuretics, ACE inhibitors, and digoxin. Coagulation studies (e.g., PT/INR/PTT) are needed in patients with history of bleeding disorders or anticoagulants.

Preoperative diagnostic tests should be based on each patient's clinical history and physical exam, type of surgery and comorbidities. Chest x-rays are important in patients >70 years of age with acute or chronic cardiopulmonary disease (e.g., asthma, COPD, and smoking). Electrocardiograms may be indicated in patients with a cardiac history (e.g., previous myocardial infarct, ischemic heart disease, heart failure, and cardiac arrhythmias), renal insufficiency, respiratory disease, or diabetes. In patients scheduled for lung resection or a clinical history of obstructive lung disease, pulmonary function tests can help quantify pulmonary function [47, 72]. Noninvasive stress testing is indicated in patients with increased risk factors who are undergoing intermediate risk or vascular surgeries [73].

3.14 The Complete Meal: Best Practices

The Sinai Center for Geriatric Surgery in Baltimore, MD incorporated all of the ACS NSQIP/AGS Best Practices and have added several others: Charlson Comorbidity Index Score, Adult Fall Risk Assessment, Eastern Cooperative Oncology Group (ECOG) Performance Status, living situation, number stairs a person can climb, hearing screen, oral/dental screen, tobacco use, pinch grip assessment, Core Healthy Days measures, Zarit Caregiver Burden Interview, and a pre-assessment and post-assessment eyeball score. This evaluation, performed by an experienced nurse practitioner on patients aged ≥75 years prior to any elective surgery, requires 20–30 min beyond a routine history and physical examination. It is performed in the preoperative assessment area. All information is entered into a database within our Cerner® electronic health record, accessible to all who care for the patient.

Problems identified preoperatively lead to more compulsive perioperative care. Alerts are placed in the chart for decreased hearing, fall risk, and potential for postoperative delirium. Patients who fail the mini-Cog are targeted for

measures to prevent postoperative delirium. The Care Management Department is notified if a patient's caregiver is found to feel severely burdened preoperatively, as that patient may present a discharge disposition problem and is less likely to return directly home. Surgeons are called if their patient is frail—procedures are rarely cancelled but operations may be modified—or if the patient does not demonstrate understanding of the planned procedure.

The financial commitment for this comprehensive program includes the salary and benefits of the nurse practitioner (who also contributes to the academic and educational mission of the Center), a hand grip strength dynamometer (Jamar®, Sammons Preston Rolyan, Bolingbrook, IL), a screening audiometer (Audioscope®, Welch Allyn, Skaneateles Falls, NY), a pinch gauge dynamometer (Jamar®, Sammons Preston Rolyan, Bolingbrook, IL), information technology support to build the electronic database, and printed material to educate referring physicians. Patients potentially could be billed for a low-level evaluation in order to offset some of the expense.

3.15 The Ala Carte Menu: More Practical Considerations

Options exist in a number of areas: the person who performs the evaluation, the location of the evaluation, a more limited dataset of tests, the location of the data, and prospective versus retrospective study [74].

3.15.1 Who Performs the Evaluation?

The Clinical Coordinator of the Center for Geriatric Surgery at Sinai Hospital of Baltimore is a veteran of the Department of Surgery, with a Doctorate of Nursing Practice. However, she has taught others to do our complete evaluation, including residents and other nurse practitioners in the preoperative testing area. The total assessment could readily be performed by a nurse, resident, medical student, physician assistant, or the patient's surgeon.

3.15.2 Location of the Evaluation

The preoperative assessment area is ideal for the geriatric evaluation: many patients are there already for laboratory testing or a routine history and physical examination. However, any clinic or surgeon's office is suitable. The hand grip dynamometer, pinch gauge dynamometer, and screening audiometer are portable (and potentially expendable, see below). The timed-up-and-go, gait speed, mini-Cog, and other tests can be completed anywhere. A hospital or

Department of Surgery might decide to pilot the program in one specialty, one division, or one large surgery group.

3.15.3 Dataset for Screening

Screening that assesses general domains of frailty, cognition, and function/performance status give important details beyond a basic history and physical exam (Table 3.1). The ACS/NSQIP AGS Best Practices guidelines recommend a five-point test of frailty popularized by Fried and proven valuable in a surgical population [55, 56]. Others, however, have employed simple gait speed or the timed-up-and-go test [54]. A basic screen of cognition is the mini-Cog, which involves a three-item recall and clock-drawing; this simple test has been correlated with risk of worse postoperative results [21, 75]. ADL, Instrumental Activities of Daily Living (IADL), and performance status (e.g., Eastern Cooperative Oncology Group score) involve simple questions and assessment. Medication reconciliation and falls risk assessment have become routine in many institutions.

Table 3.1 Comprehensive versus limited dataset for screening

Comprehensive	Limited (one from each domain)
CAGE screen for alcohol abuse	<i>Cognition:</i> Mini-Cog MMSE
Cardiac and pulmonary risk factors	
Frailty, 5-point phenotype assessment	
ADL	<i>Frailty:</i> Stair climbing Gait speed TUG
IADL	
TUG	
Nutrition screen	<i>Function:</i> ECOG ADL IADL
Hearing screen	
Medication review	
Charlson comorbidity index score	
Advanced directive counseling	
Fall risk assessment	
Performance status, ECOG	
Stair-climbing question	
Living situation	
Quality of life/health rating	
Estimated creatinine clearance/ GFR	
Postoperative delirium risk factors	
Caregiver burden interview	
Provider “Gestalt” assessment	
Oral/dental screen	
Pincher strength assessment	

Abbreviations: *ADL* activities of daily living, *CAGE* cut-down, annoyed, guilty, eye-opener, *ECOG* Eastern Cooperative Oncology Group Performance Scale, *GFR* glomerular filtration rate, *IADL* instrumental activities of daily living, *MMSE* Mini Mental Status Examination, *TUG* timed up-and-go test

3.15.4 Location of the Data

An electronic health record is optimal for the location of testing results, as it is accessible by all throughout the patient’s perioperative course. If the database is constructed with discrete fields, it may be queried subsequently for research or quality improvement purposes. A paper form which follows the patient is also possible, as is a simple addendum to the dictated history and physical examination.

Allowing access to the geriatric preoperative assessment allows not only the surgical management team but also physical therapy, occupational therapy, nursing and social workers to understand more clearly the patient’s baseline. Physical and occupational therapy are able to better gauge a patient’s preoperative activity status as physician admission notes often do not contain important information regarding details covered in a geriatric preoperative assessment. Social workers can often anticipate in advance what additional services may need to be obtained for the patient prior to discharge.

3.16 The Sinai Abbreviated Geriatric Evaluation

Many different geriatric and frailty evaluations exist. A review in 2016 identified 21 different frailty tools alone [76]. Some assessments use preexisting data from the medical record, some test the patient directly, and some use both sources of data. Although good for research purposes, these instruments are impractical for day-to-day use, as they are either too complicated or there is too much to remember or special equipment is required.

The Sinai Abbreviated Geriatric Evaluation (SAGE) (Table 3.2) was constructed to be practical. It can be performed by anyone in almost any setting, requires no special equipment, and takes only minutes to perform. It has been shown to be predictive of outcomes in older adult surgical patients. For example, for every one point decrease in a patient’s SAGE score, that patient has a 1.5 odds ratio for a complication and a 2.0 odds ratio for postoperative delirium. SAGE has also been validated against other preoperative risk screening tools such as Fried’s five-point frailty phenotype, the Charlson Comorbidity Index, and the American Society of Anesthesiologists Physical Status Class [77].

SAGE has been built into different electronic medical record systems and is in use in hospitals and clinics of various sizes. It has the advantage of actually testing the patient rather than relying on a list of comorbidities or laboratory findings. It is one alternative to more complex assessments.

Table 3.2 The Sinai Abbreviated Geriatric Evaluation (SAGE): A quick and easy screening tool for geriatric patients

Component	Domain	Description	Modified scoring ^a
Modified Mini-Cog™	Cognition	Three-minute screening tool for cognitive impairment in older adults	Recall 0 word, any clock: 0 point Recall 1–2 words, abnormal clock: 0 point Recall 1–2 words, normal clock: 1 point Recall 3 words, any clock: 1 point
Gait speed	Frailty	Patient timed walking 15 ft at normal speed (average of three trials)	Normal pace (average ≤ 7 s): 1 point Abnormal pace (average > 7 s): 0 point
Activities of daily living	Function	Four questions: “Can you get out of bed or chair yourself?” “Can you dress and bathe yourself?” “Can you make your own meals?” “Can you do your own shopping?”	Any “No” answer: 0 point Four “Yes” answers: 1 point

For the Mini-Cog™, patients were asked to remember “sunrise, banana, chair,” then handed a paper with a blank circle in order to place all numbers on the clock and the hands at “10 min until 2 o’clock,” then asked to repeat the three words. Patients were then guided, for the *gait speed*, to a point in the hallway 15 ft from the examiner and asked to walk to her, being timed with a stopwatch. Patients were asked the four activities of daily living (ADL) questions. Scores from 0 to 3 were recorded as indicated in the table

^aThe SAGE score is the sum of the scores of the three components and ranges from 0 (highest risk) to 3 (lowest risk)

3.17 ACS Geriatric Surgery Verification (GSV) Program

The Geriatric Surgery Verification (GSV) Program, a quality program of the ACS funded by a grant from the John A. Hartford Foundation, released/published standards in July 2019 along with the verification program [78]. This program reflects the design of the current ACS quality programs to promote safe and quality surgical care. The ACS *Optimal Resources for Geriatric Surgery 2019 Standards* can be found at www.facs.org/geriatrics.

For a hospital to be recognized as a center of excellence in the care of the older surgical patient the established GSV standards must be met. The standards relate to any patient 75 years and older having any elective surgery that requires an inpatient stay. Standards are modified for the nonelective older surgical patient. It is the hope by implementing these evidence-based, rigorous standards, hospitals will create patient-centered programs to enhance care for older adult surgical patients.

A number of standards relate to the preoperative assessment of the older surgical patient, including shared decision-making and assessment of geriatric-specific vulnerabilities. For example, Standard 5—Patient Care: Expectations and Protocols requires goals of care discussions and geriatric screens to identify potential areas of vulnerability (Table 3.3). The goals of care discussion should include overall health goals, treatment goals specific to the current condition, and anticipated impact of surgery and nonsurgical treatments on symptoms, function, burden of care, living situation, and survival [79–81]. Optimally, some of these should be bracketed

Table 3.3 Geriatric vulnerability screens, Geriatric Surgery Verification Program (GSV)

Age ≥ 85 years
Impaired cognition
Delirium risk
Impaired functional status
Impaired mobility
Malnutrition
Difficulty swallowing
Need for palliative care assessment

by quotes in the patient’s own words, similar to a chief complaint in a history and physical document. There is no specific set of screening tools set forth by the ACS but the use of validated instruments is recommended.

If a positive geriatric vulnerability screen is identified in any category, the patient will be designated as “high risk” and requires a documented management plan directed at positive findings from the screens. The plans must be guided by established protocols or an evaluation by other health-care providers commensurate with individual patient needs [82].

In elective settings, management plans for positive screens must be implemented preoperatively. In nonelective settings, management plans for positive screens must be addressed within the 48-h postoperative window or as soon as clinically appropriate.

In the elective setting, any patient identified as high risk based on the geriatric vulnerability screens must be evaluated with interdisciplinary input after the implementation of focused management plans and before surgery to reassess

the indications, risks, and benefits of the proposed operation [83, 84].

It is hoped that by performing these geriatric vulnerability screens preoperatively, a more holistic assessment of the older surgical patient will provide information not gathered from a routine medical history and physical examination. This information helps to better inform the surgical team as well as gives an opportunity for the older patient to understand their risks and benefits of surgery or the possible need for prehabilitation in a particular area [85].

3.18 Conclusion

The population is aging and the conditions that require surgery increase with increasing age. We therefore will be encountering more older adults who require surgery. The older preoperative patient benefits from an assessment that includes more than a routine physical examination and electrocardiogram. Such an assessment includes domains likely to affect the elderly: cognition, functionality, frailty, polypharmacy, nutrition, and social support. This fosters decisions based on functional age rather than chronologic age and on each patient as a unique individual.

One such assessment is that promulgated by the ACS NSQIP/AGS Best Practices Guideline. If this comprehensive evaluation is considered impractical for an institution or surgeon's office, a limited dataset of tests will still be valuable. Any opportunity to improve results in the growing population of older surgical patients should not be missed.

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