Preoperative Assessment in Older Adults: A Comprehensive Approach

Chandrika Kumar, MD, Yale University School of Medicine, New Haven, Connecticut
Brooke Salzman, MD, Thomas Jefferson University, Philadelphia, Pennsylvania
Jessica L. Colburn, MD, Johns Hopkins University School of Medicine, Baltimore, Maryland

Surgical outcomes are significantly influenced by patients' overall health, function, and life expectancy. A comprehensive geriatric preoperative assessment of older adults requires expanding beyond an organ-based or disease-based assessment. At a preoperative visit, it is important to establish the patient's goals and preferences, and to determine whether the risks and benefits of surgery match these goals and preferences. These discussions should cover the possibility of resuscitation and ventilator support, prolonged rehabilitation, and loss of independence. The assessment should include evaluation of medical comorbidities, cognitive function, decision-making capacity, functional status, fall risk, frailty, nutritional status, and potentially inappropriate medication use. Problems identified in any of these key areas are associated with an increased risk of postoperative complications, institutionalization, functional decline, and, in some cases, mortality. If a patient elects to proceed with surgery, the risks should be communicated to surgical teams to allow for inpatient interventions that lower the risk of postoperative complications and functional decline, such as early mobilization and limiting medications that can cause delirium. Alcohol abuse and smoking are associated with increased rates of postoperative complications, and physicians should discuss cessation with patients before surgery. Physicians should also assess patients' social support systems because they are a critical component of discharge planning in this population and have been shown to predict 30-day postoperative morbidity. (*Am Fam Physician*. 2018;98(4):214-220. Copyright © 2018 American Academy of Family Physicians.)

Nearly 5 million major operations are performed annually in the United States in patients 65 years and older, and older adults undergo operating room procedures at two to three times the rate of younger age groups.[1] The demand for surgical services is projected to increase as the population ages.[2] Although advances in care have decreased surgical risks, older adults experience disproportionate levels of postoperative morbidity and mortality. Conducting a geriatric preoperative assessment involves eliciting patients' goals and priorities in the context of their overall health and likely surgical outcomes, and considering whether the risks and benefits of surgery match these goals.[3] If the benefits appear to outweigh the risks, then the physician should evaluate the patient's decision-making capacity, cognition, comorbidities, presence of depression and frailty, functional status, fall risk, nutrition, and use of potentially inappropriate medications. These factors can help predict possible postoperative complications and inform recommendations on preoperative optimization and risk reduction. This article summarizes the key components of a comprehensive geriatric preoperative assessment for primary care physicians based on 2012 guidelines.[4]

Additional content at https://www.aafp.org/afp/2018/0815/p214.html.

CME **This clinical content** conforms to AAFP criteria for continuing medical education (CME). See CME Quiz on page 203.

Author disclosure: No relevant financial affiliations.

Decision Making and Goal Setting

Patients with multiple comorbidities and decreased functional status are more vulnerable and experience poorer surgical outcomes.[5,6] Additionally, patients often overestimate the benefits and underestimate the risks of interventions and treatment.[7] Surgery in high-risk patients may shorten a limited life expectancy or negatively impact functional status or quality of life. Primary care physicians can help patients determine goals and preferences before surgery.

ESTABLISHING PATIENT GOALS AND PRIORITIES

One approach to establishing goals is to discuss how patients prioritize longevity, functional status, and comfort.[8] Patients who value living as long as possible over maintaining independence or comfort may be willing to pursue a high-risk surgery, whereas patients who prioritize function and independence may not want to risk surgery that may require prolonged rehabilitation or placement in long-term care.

Physicians should also address patient preferences on resuscitation and ventilator support. Although many surgical procedures require adjusting resuscitation preferences

at the time of surgery, the discussion should include when to resume these preferences if patients do not want resuscitation in the event of significant postoperative complications.[9,10] Patients and their caregivers also may want to consider the possibility of complications that could affect functional status or prognosis, and whether the patient would adjust his or her goals at that point.

ASSESSING RISKS AND BENEFITS OF SURGERY

Risks, benefits, and potential outcomes can be discussed before making a referral to a surgeon for an elective procedure, or at the preoperative assessment if input from the surgeon is needed. Factors to consider include type of surgery, type and risk of anesthesia, recovery time, and alternatives to surgery, which may include palliative care. It is also important to consider any high-risk medical conditions,[11] as well as overall life expectancy, which may be impacted by dementia or poor functional status. There are several prognostic models available at http://www.ePrognosis.org that can assist physicians with estimating patients' prognosis and life expectancy. If the prognosis is poor, patients may be less likely to benefit from certain surgical procedures, and discussing palliative care or hospice may be more appropriate. If it is determined that surgery is appropriate based on a patient's goals and expectations, then the physician should proceed with a geriatric preoperative assessment *(Table 1)*.[12-29]

Geriatric Preoperative Assessment

COGNITION

Delirium, dementia, and depression are important considerations when evaluating cognition, because impaired sensorium has been shown to increase the risk of postoperative complications and mortality.[30]

Delirium is defined as an acute state of confusion and inattention, which may be accompanied by an altered level of consciousness and disorganized thinking. It is associated with poorer outcomes in the postoperative setting, including increased length of hospital stay, pulmonary complications, in-hospital falls, dehydration, and infections.[31] The risk of developing delirium can be determined by assessing the number of predisposing and precipitating factors *(Table 2)*.[32] Targeting risk factors can reduce the occurrence and severity of delirium. For example, physicians can encourage family members to be at the patient's bedside, bring eyeglasses and hearing aids for those with vision or hearing impairment, and reorient often. Health care teams can promote early mobilization, early referral to physical and occupational therapy, adequate nutritional support and pain management, and minimization of patient tethers (e.g., Foley catheters, intravenous poles, electrocardiogram cords). The Confusion Assessment Method can help identify delirium in the perioperative period in high-risk patients.[14] This method involves identifying key diagnostic criteria of delirium including (1) acute onset and fluctuating course, (2) inattention, (3) disorganized thinking, and (4) altered level of consciousness. The diagnosis of delirium using the Confusion Assessment Method requires the presence of the first two features plus either the third or fourth feature.

There are many tools to screen for cognitive impairment, including the Mini-Cog, a quick screening tool in the outpatient setting[12] *(Table 3[33])*. If the Mini-Cog screening is positive, further clinical assessment for dementia is warranted.[33]

SORT: KEY RECOMMENDATIONS FOR PRACTICE

Clinical recommendation	Evidence rating	References
Older adults planning to undergo surgery should be assessed for impaired sensorium (delirium, cognitive impairment, or depression).	C	30, 33, 35
Older adults planning to undergo surgery should be evaluated for functional impairment by asking about activities of daily living and instrumental activities of daily living.	C	4, 20, 33
Older adults should be screened for fall risk by asking about falls within the past 12 months and difficulty with walking.	B	43, 44
Patients should be counseled to quit smoking and provided behavioral support to aid in smoking cessation before surgery.	B	54
Physicians should use a validated tool, such as the updated Beers criteria, to screen for potentially inappropriate medications in older adults during a medication review.	C	28

A = consistent, good-quality patient-oriented evidence; **B** = inconsistent or limited-quality patient-oriented evidence; **C** = consensus, disease-oriented evidence, usual practice, expert opinion, or case series. For information about the SORT evidence rating system, go to https://www.aafp.org/afpsort.

Depressive symptoms have also been associated with poor functional recovery and increased likelihood of discharge to a facility posthospitalization.[34,35] Patients with preoperative depressive symptoms are more likely to develop and experience a longer duration of postoperative delirium.[36] Screening for depression can be done using the Patient Health Questionnaire-2[16] or the Geriatric Depression Scale[17] *(eTable A*; http://web.stanford.edu/~yesavage/GDS.html), both of which are brief, validated tools.

DECISION-MAKING CAPACITY ASSESSMENT

Assessing decision-making capacity is important, particularly if deficits are found on cognitive testing. Some patients lack capacity for specific periods of time, such as during critical illness, but not permanently. Patients with impaired capacity may still be able to make focused, less risky diagnostic and treatment decisions. The Aid to Capacity Evaluation is a useful tool that focuses on the specific decision the patient is facing and identifies the four elements of capacity: (1) understanding of the proposed treatment, (2) understanding of the risks, benefits, and alternative options, (3) ability to make a choice, and (4) ability to communicate the choice to the physicians.[37] The Aid to Capacity Evaluation tool can be performed in less than 30 minutes and is available free online

TABLE 1

Focal Areas for Comprehensive Geriatric Preoperative Assessment

Domain	Assessment tool
Cognition	Dementia: Mini-Cog screening[12] (Table 3); if positive, follow up with the Montreal Cognitive Assessment[13]
	Delirium: Identify predisposing and precipitating factors and what structured programs can be in place before surgery. The Confusion Assessment Method is the most effective tool in identifying delirium, and can be used by trained physicians and nursing staff to identify delirium at admission and throughout a patient's postoperative course.[14,15]
	Depression: Patient Health Questionnaire-2[16] or Geriatric Depression Scale[17] (eTable A) See related article on mental status examinations at https://www.aafp.org/afp/2016/1015/p635.html
Capacity	Aid to Capacity Evaluation tool[18] (http://www.jcb.utoronto.ca/tools/documents/ace.pdf) See related article on evaluating medical decision-making capacity at https://www.aafp.org/afp/2018/0701/p40.html
Function	Katz Index of Independence in Activities of Daily Living[19] (eTable B) and Lawton Instrumental Activities of Daily Living scale[20] (eTable C)
Mobility and fall risk	Two-question fall-risk screening: (1) Have you fallen twice or more in the past year or sought medical attention for a fall? (2) If you haven't fallen, do you feel unsteady walking? Positive screen should be followed by a performance measure, such as a Timed Up and Go test[21]
Frailty	Utilize Fried criteria[22] for frailty, which involve three or more of the following: unintentional weight loss (≥ 10 lb [4.5 kg] in past year), self-reported exhaustion, weakness (grip strength), slow walking speed, and low physical activity, or another clinical measure of frailty, such as the Clinical Frailty Scale[23] (http://geriatricresearch.medicine.dal.ca/pdf/Clinical%20Faily%20Scale.pdf)
Nutrition	Mini Nutritional Assessment[24]: Unintentional weight loss exceeding 10% to 15% over six months Body mass index < 18.5 kg per m^2 Albumin level < 3 g per dL (30 g per L) in the absence of liver/kidney disease
Alcohol and tobacco use	CAGE questionnaire for alcohol use[25] Short Michigan Alcoholism Screening Test–Geriatric Version[26]
Cardiac evaluation	American College of Cardiology/American Heart Association algorithm for cardiac evaluation and care for noncardiac surgery[27] Routine chest radiography and pulmonary function tests are not recommended, but perioperative strategies include optimizing pulmonary function in patients with chronic obstructive pulmonary disease and/or uncontrolled asthma, and smoking cessation
Medication review	Beers criteria[28] STOPP/START criteria[29]
Family support	Identify surrogate decision maker

Note: See a previous *AFP* article on geriatric assessment at https://www.aafp.org/afp/2018/0615/p776.html.

START = screening tool to alert doctors to right treatment; STOPP = screening tool of older persons' prescriptions.

Information from references 12 through 29.

TABLE 2

Risk Factors for Delirium: Predisposing and Precipitating Factors and Medications

Predisposing factors	Precipitating factors	Medications
Comorbidities	Acute insults	High risk
Alcoholism	Dehydration	Anticholinergics (e.g., antihistamines, muscle relaxants, antipsychotics)
Chronic pain	Fracture	Benzodiazepines
History of baseline lung, liver, kidney, heart, or brain disease	Hypoxia	Dopamine agonists
Terminal illness	Infection	Meperidine (Demerol)
Demographic factors	Ischemia (e.g., cerebral, cardiac)	Moderate to low risk
Age older than 65 years	Medications	Antibiotics (e.g., quinolones, antimalarials, isoniazid, linezolid [Zyvox], macrolides)
Male sex	Metabolic derangement	Anticonvulsants
Geriatric factors	Poor nutrition	Antidizziness agents
Dementia	Severe illness	Antiemetics
Depression	Shock	Antihypertensives (e.g., beta blockers, clonidine)
Elder abuse	Surgery	Antivirals (e.g., acyclovir, interferon)
Falls	Uncontrolled pain	Corticosteroids
History of delirium	Urinary or stool retention	Low-potency antihistamines (e.g., histamine H_2 blockers, urinary and gastrointestinal antispasmodics)
Malnutrition	Environmental exposures	Metoclopramide (Reglan)
Polypharmacy	Intensive care unit setting	Narcotics other than meperidine
Pressure ulcers	Sleep deprivation	Nonsteroidal anti-inflammatory drugs
Sensory impairment	Tethers	Sedatives/hypnotics
Premorbid state		Tricyclic antidepressants
Inactivity		
Poor functional status		
Social isolation		

Adapted with permission from Kalish VB, Gillham JE, Unwin BK. Delirium in older persons: evaluation and management [published corrections appear in Am Fam Physician. *2015;92(6):430, and* Am Fam Physician. *2014;90(12):819].* Am Fam Physician. *2014;90(3):152.*

(http://www.jcb.utoronto.ca/tools/documents/ace.pdf).[18,38] For patients who lack capacity, a surrogate will need to assist with decision making and informed consent in the perioperative period.

FUNCTIONAL ASSESSMENT

Although many community-dwelling older adults are functionally independent, the percentage who need help performing activities of daily living doubles with each decade of age into the mid 80s.[39] Functional status can be assessed using the Katz Index *(eTable B)* to assess activities of daily living[19] and the Lawton scale *(eTable C)* to assess instrumental activities of daily living.[20] Patients with functional impairment are at increased risk of postoperative complications, including functional decline and institutionalization.[40]

Patients with functional deficits in their activities of daily living or difficulty with mobility should be referred to an occupational or physical therapist for further evaluation and preoperative therapy as appropriate. Prehabilitation involving multimodal approaches, including home exercise, nutrition assessment, relaxation techniques, and pain management, has been shown to improve postsurgical functional outcomes.[41,42]

MOBILITY AND FALLS

Falls are the primary cause of unintentional injury in older adults and a leading cause of death in this population. Mobility limitations are common in older adults and are associated with depression, social isolation, and decreased quality of life.[43,44] Mobility limitations and falls lead to functional decline, hospitalization, institutionalization, and increased health care costs.[43] In older adults undergoing surgery, a recent history of falls within the past 12 months is associated with increased postoperative complications, discharge to a rehabilitation facility, and high rates of hospital readmission.[44] Fall risk can be assessed with measures such as the Timed Up and Go test.[45] Strategies to reduce fall risk and improve mobility include exercise programs, physical therapy, and reducing medications associated with falls.[4]

TABLE 3

Mini-Cognitive Assessment Instrument

Step 1. Ask the patient to repeat three unrelated words, such as ball, dog, and television.

Step 2. Ask the patient to draw a simple clock set to 10 minutes after 11 o'clock (11:10). A correct response is drawing of a circle with the numbers placed in approximately the correct positions, with the hands pointing to the 11 and 2.

Step 3. Ask the patient to recall the three words from Step 1. One point is given for each item that is recalled correctly.

Interpretation

Number of items correctly recalled	Clock drawing test result	Interpretation of screen for dementia
0	Normal	Positive
0	Abnormal	Positive
1	Normal	Negative
1	Abnormal	Positive
2	Normal	Negative
2	Abnormal	Positive
3	Normal	Negative
3	Abnormal	Negative

Adapted with permission from Ebell MH. Brief screening instruments for dementia in primary care. Am Fam Physician. *2009;79(6):500.*

These interventions can improve postoperative function, safety, and quality of life.[46]

FRAILTY

The physical phenotype of frailty is a clinical syndrome in which three or more of the following criteria are present: unintentional weight loss (10 lb [4.5 kg] in the past year), self-reported exhaustion, weakness (grip strength), slow walking speed, and low physical activity.[22] There are several instruments to assess frailty, but, although comprehensive, they involve performance-based measurements that may be challenging in the outpatient clinic. If frailty is identified and time allows, interventions to reduce frailty before surgery may be tried.[47] There are interventional studies on how best to do this, including vitamin D supplementation, protein supplementation, and exercise programs; however, general use of supplementation to treat frailty remains controversial. Increased levels of frailty may alert anesthesiologists to titrate fluid status and other physiologic parameters more narrowly than usual in the perioperative period.[48]

NUTRITION

Preoperative malnutrition has been shown to predict wound dehiscence, anastomotic leaks, infection, delirium, mortality, and increased length of hospital stay.[4] The Mini Nutritional Assessment is the preoperative assessment tool with the greatest sensitivity and specificity (http://www.mna-elderly.com/forms/mini/mna_mini_english.pdf).[49] High-risk patients should be referred before elective surgery to a dietitian who can implement a perioperative nutritional supplementation plan.[4]

ALCOHOL AND TOBACCO USE

It is important to screen for alcohol use and notify surgical teams of the risk of alcohol withdrawal. Preoperative alcohol abuse and dependence are associated with increased rates of morbidity, postoperative complications, and prolonged hospitalizations.[4,50] The most common screening tool is the CAGE questionnaire.[25] Abstinence from alcohol is recommended four to eight weeks before surgery.[51] Intensive preoperative alcohol cessation interventions, including pharmacologic strategies for relapse prophylaxis and withdrawal symptoms, may significantly reduce postoperative complication rates.[51] Preoperative behavioral interventions may help reduce risky drinking, but their effectiveness and applicability to older adults are not clear.[52]

Similarly, tobacco use among older adults is associated with greater mortality, higher postoperative complication rates, and poorer physical functioning.[53] Preoperative smoking cessation interventions may improve short-term smoking cessation rates and reduce mortality.[54]

CARDIAC AND PULMONARY RISK

Cardiac risk evaluation is a central component of the preoperative surgical evaluation. Postoperative myocardial infarction is associated with significantly elevated in-hospital mortality rates. The American College of Cardiology and the American Heart Association have developed a guideline to assist physicians with evaluating cardiac risk before noncardiac surgery.[27] The guideline recommends using preoperative cardiac testing judiciously, avoiding testing before low-risk surgeries, and ordering testing only if the results will change clinical management.

Postoperative pulmonary complications may prolong the hospital stay by one to two weeks and contribute to functional decline and increased morbidity and mortality. Risk factors for pulmonary complications include age older than 60 years, underlying lung disease, functional dependence, current smoking, delirium, weight loss, and surgical factors such as prolonged or emergency surgery, general anesthesia, and neuromuscular blockage.[4]

MEDICATION REVIEW

A complete review of a patient's medications, including over-the-counter medications, vitamins, and herbal supplements, is essential to identify medications that should be continued

during the perioperative period as well as medications that may cause adverse effects, drug-drug interactions, or withdrawal.[4] A medication review may uncover discrepancies between what patients are actually taking and what is listed on a medication list, and it provides an opportunity to remove medications that may be harmful or ineffective, or lack an indication. In one study, more than 50% of older patients undergoing surgery received a potentially inappropriate medication during their surgical hospitalization, underscoring the need to recognize and reduce potentially inappropriate medications in the perioperative period.[55] There are multiple validated tools to assist in identifying potentially inappropriate medications among older adults, including the updated Beers criteria and the STOPP (screening tool of older persons' prescriptions) and START (screening tool to alert doctors to right treatment) criteria.[28,29]

Transition Planning

When included in a geriatric preoperative assessment, social support has been shown to predict 30-day postoperative morbidity.[40] The American College of Surgeons/American Geriatrics Society guideline recommends that physicians assess patients' social support systems, because these are critical components of discharge planning.[4] Primary care physicians should discuss postoperative plans with patients, including planning for recovery time, which may include a rehabilitation facility, home care, or additional support at home. The patient should be counseled about when to call the primary care physician after discharge, such as for medication reconciliation or a postoperative appointment to ensure a safe transition to home.

Editor's Note: For a previous *AFP* article on geriatric assessment, visit https://www.aafp.org/afp/2018/0615/p776.html. For a previous *AFP* article on evaluating medical decision-making capacity, visit https://www.aafp.org/afp/2018/0701/p40.html.

Data Sources: We performed a literature search using PubMed, the Cochrane Database of Systematic Reviews, evidence-based guidelines from the National Guideline Clearinghouse, the Institute for Clinical Systems Improvement, and the U.S. Preventive Services Task Force. Key words included preoperative care, geriatric assessment, and aged or aged 80 and over. Search dates: September 10, 2017, and February 21, 2018.

The Authors

CHANDRIKA KUMAR, MD, is an assistant professor of medicine in the Section of Geriatrics at Yale University School of Medicine, New Haven, Conn. She is also associate fellowship director of the Clinical Fellowship in Geriatric Medicine and the director of resident geriatric education.

BROOKE SALZMAN, MD, is an associate professor in the Department of Family and Community Medicine at Thomas Jefferson University, Philadelphia, Pa. She is also program director of the geriatric fellowship and medical director of the Division of Geriatric Medicine and Palliative Care.

JESSICA L. COLBURN, MD, is an assistant professor of medicine in the Division of Geriatric Medicine and Gerontology at Johns Hopkins University School of Medicine, Baltimore, Md.

Address correspondence to Chandrika Kumar, MD, Yale University School of Medicine, 20 York St., New Haven, CT 06519 (e-mail: Chandrika.kumar@yale.edu). Reprints are not available from the authors.

References

1. Elixhauser A, Andrews RM. Profile of inpatient operating room procedures in US hospitals in 2007. *Arch Surg*. 2010;145(12):1201-1208.
2. Dall TM, Gallo PD, Chakrabarti R, West T, Semilla AP, Storm MV. An aging population and growing disease burden will require a large and specialized health care workforce by 2025. *Health Aff (Millwood)*. 2013;32(11):2013-2020.
3. Oresanya LB, Lyons WL, Finlayson E. Preoperative assessment of the older patient: a narrative review. *JAMA*. 2014;311(20):2110-2120.
4. Chow WB, Rosenthal RA, Merkow RP, Ko CY, Esnaola NF. Optimal preoperative assessment of the geriatric surgical patient: a best practices guideline from the American College of Surgeons National Surgical Quality Improvement Program and the American Geriatrics Society. *J Am Coll Surg*. 2012;215(4):453-466.
5. Neuman MD, Silber JH, Magaziner JS, Passarella MA, Mehta S, Werner RM. Survival and functional outcomes after hip fracture among nursing home residents. *JAMA Intern Med*. 2014;174(8):1273-1280.
6. Partridge JS, Harari D, Martin FC, Dhesi JK. The impact of pre-operative comprehensive geriatric assessment on postoperative outcomes in older patients undergoing scheduled surgery: a systematic review. *Anaesthesia*. 2014;69(suppl 1):8-16.
7. Hoffmann TC, Del Mar C. Patients' expectations of the benefits and harms of treatments, screening, and tests: a systematic review. *JAMA Intern Med*. 2015;175(2):274-286.
8. Schamp R, Tenkku L. Managed death in a PACE: pathways in present and advance directives. *J Am Med Dir Assoc*. 2006;7(6):339-344.
9. Association of periOperative Registered Nurses. AORN position statement on perioperative care of patients with do-not-resuscitate or allow-natural-death orders. https://www.aorn.org/-/media/aorn/guidelines/position-statements/posstat-dnr-w.pdf. Accessed February 21, 2018.
10. American Society of Anesthesiologists. Ethical guidelines for the anesthesia care of patients with do-not-resuscitate orders or other directives that limit treatment. http://www.asahq.org/~/media/sites/asahq/files/public/resources/standards-guidelines/ethical-guidelines-for-the-anesthesia-care-of-patients.pdf. Accessed September 9, 2017.
11. King MS. Preoperative evaluation. *Am Fam Physician*. 2000;62(2):387-396.
12. Borson S, Scanlan JM, Chen P, Ganguli M. The Mini-Cog as a screen for dementia: validation in a population-based sample. *J Am Geriatr Soc*. 2003;51(10):1451-1454.
13. Nasreddine ZS, Phillips NA, Bédirian V, et al. The Montreal Cognitive Assessment, MoCA: a brief screening tool for mild cognitive impairment. *J Am Geriatr Soc*. 2005;53(4):695-699.
14. Inouye SK, van Dyck CH, Alessi CA, Balkin S, Siegal AP, Horwitz RI. Clarifying confusion: the confusion assessment method. A new method for detection of delirium. *Ann Intern Med*. 1990;113(12):941-948.
15. Wong CL, Holroyd-Leduc J, Simel DL, Straus SE. Does this patient have delirium?: value of bedside instruments. *JAMA*. 2010;304(7):779-786.

16. Kroenke K, Spitzer RL, Williams JB. The Patient Health Questionnaire-2: validity of a two-item depression screener. *Med Care*. 2003;41(11):1284-1292.
17. Burke WJ, Roccaforte WH, Wengel SP. The short form of the Geriatric Depression Scale: a comparison with the 30-item form. *J Geriatr Psychiatry Neurol*. 1991;4(3):173-178.
18. Sessums LL, Zembrzuska H, Jackson JL. Does this patient have medical decision-making capacity? *JAMA*. 2011;306(4):420-427.
19. Katz S, Downs TD, Cash HR, Grotz RC. Progress in development of the index of ADL. *Gerontologist*. 1970;10(1):20-30.
20. Lawton MP, Brody EM. Assessment of older people: self-maintaining and instrumental activities of daily living. *Gerontologist*. 1969;9(3):179-186.
21. Hofheinz M, Mibs M. The prognostic validity of the Timed Up and Go Test with a dual task for predicting the risk of falls in the elderly. *Gerontol Geriatr Med*. 2016;2:2333721416637798.
22. Fried LP, Tangen CM, Walston J, et al.; Cardiovascular Health Study Collaborative Research Group. Frailty in older adults: evidence for a phenotype. *J Gerontol A Biol Sci Med Sci*. 2001;56(3):M146-M156.
23. Rockwood K, Song X, MacKnight C, et al. A global clinical measure of fitness and frailty in elderly people. *CMAJ*. 2005;173(5):489-495.
24. Cohendy R, Gros T, Arnaud-Battandier F, Tran G, Plaze JM, Eledjam J. Preoperative nutritional evaluation of elderly patients: the Mini Nutritional Assessment as a practical tool. *Clin Nutr*. 1999;18(6):345-348.
25. Ewing JA. Detecting alcoholism. The CAGE questionnaire. *JAMA*. 1984;252(14):1905-1907.
26. Naegle MA. Screening for alcohol use and misuse in older adults: using the Short Michigan Alcoholism Screening Test—Geriatric Version. *Am J Nurs*. 2008;108(11):50-58.
27. Fleisher LA, Fleischmann KE, Auerbach AD, et al. 2014 ACC/AHA guideline on perioperative cardiovascular evaluation and management of patients undergoing noncardiac surgery: executive summary: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. *Circulation*. 2014;130(24):2215-2245.
28. American Geriatrics Society 2015 Updated Beers Criteria for potentially inappropriate medication use in older adults. *J Am Geriatr Soc*. 2015;63(11):2227-2246.
29. O'Mahony D, O'Sullivan D, Byrne S, O'Connor MN, Ryan C, Gallagher P. STOPP/START criteria for potentially inappropriate prescribing in older people: version 2. *Age Ageing*. 2015;44(2):213-218.
30. Gajdos C, Kile D, Hawn MT, Finlayson E, Henderson WG, Robinson TN. The significance of preoperative impaired sensorium on surgical outcomes in nonemergent general surgical operations. *JAMA Surg*. 2015;150(1):30-36.
31. Inouye SK, Westendorp RG, Saczynski JS. Delirium in elderly people. *Lancet*. 2014;383(9920):911-922.
32. Kalish VB, Gillham JE, Unwin BK. Delirium in older persons: evaluation and management [published corrections appear in *Am Fam Physician*. 2015;92(6):430, and *Am Fam Physician*. 2014;90(12):819]. *Am Fam Physician*. 2014;90(3):150-158.
33. Ebell MH. Brief screening instruments for dementia in primary care. *Am Fam Physician*. 2009;79(6):497-498, 500.
34. Kothari A, Phillips S, Bretl T, Block K, Weigel T. Components of geriatric assessments predict thoracic surgery outcomes. *J Surg Res*. 2011;166(1):5-13.
35. Feng MA, McMillan DT, Crowell K, Muss H, Nielsen ME, Smith AB. Geriatric assessment in surgical oncology: a systematic review. *J Surg Res*. 2015;193(1):265-272.
36. Leung JM, Sands LP, Mullen EA, Wang Y, Vaurio L. Are preoperative depressive symptoms associated with postoperative delirium in geriatric surgical patients? *J Gerontol A Biol Sci Med Sci*. 2005;60(12):1563-1568.
37. Dunn LB, Nowrangi MA, Palmer BW, Jeste DV, Saks ER. Assessing decisional capacity for clinical research or treatment: a review of instruments. *Am J Psychiatry*. 2006;163(8):1323-1334.
38. Etchells E, Darzins P, Silberfeld M, et al. Assessment of patient capacity to consent to treatment. *J Gen Intern Med*. 1999;14(1):27-34.
39. Comprehensive functional assessment for elderly patients. Health and Public Policy Committee, American College of Physicians. *Ann Intern Med*. 1988;109(1):70-72.
40. Kenig J, Olszewska U, Zychiewicz B, Barczynski M, Mituś-Kenig M. Cumulative deficit model of geriatric assessment to predict the postoperative outcomes of older patients with solid abdominal cancer. *J Geriatr Oncol*. 2015;6(5):370-379.
41. Li C, Carli F, Lee L, et al. Impact of a trimodal prehabilitation program on functional recovery after colorectal cancer surgery: a pilot study. *Surg Endosc*. 2013;27(4):1072-1082.
42. Harari D, Hopper A, Dhesi J, Babic-Illman G, Lockwood L, Martin F. 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*. 2007;36(2):190-196.
43. Tinetti ME, Baker DI, McAvay G, et al. A multifactorial intervention to reduce the risk of falling among elderly people living in the community. *N Engl J Med*. 1994;331(13):821-827.
44. Jones TS, Dunn CL, Wu DS, Cleveland JC Jr., Kile D, Robinson TN. Relationship between asking an older adult about falls and surgical outcomes. *JAMA Surg*. 2013;148(12):1132-1138.
45. Panel on Prevention of Falls in Older Persons, American Geriatrics Society and British Geriatrics Society. Summary of the Updated American Geriatrics Society/British Geriatrics Society clinical practice guideline for prevention of falls in older persons. *J Am Geriatr Soc*. 2011;59(1):148-157.
46. Brown CJ, Flood KL. Mobility limitation in the older patient: a clinical review. *JAMA*. 2013;310(11):1168-1177.
47. Laosa O, Alonso C, Castro M, Rodriguez-Manas L. Pharmaceutical interventions for frailty and sarcopenia. *Curr Pharm Des*. 2014;20(18):3068-3082.
48. Nakhaie M, Tsai A. Preoperative assessment of geriatric patients. *Anesthesiol Clin*. 2015;33(3):471-480.
49. Rubenstein LZ, Harker JO, Salvà A, Guigoz Y, Vellas B. Screening for undernutrition in geriatric practice: developing the short-form Mini-Nutritional Assessment (MNA-SF). *J Gerontol A Biol Sci Med Sci*. 2001;56(6):M366-M372.
50. Eliasen M, Grønkjær M, Skov-Ettrup LS, et al. Preoperative alcohol consumption and postoperative complications: a systematic review and meta-analysis. *Ann Surg*. 2013;258(6):930-942.
51. Oppedal K, Møller A, Pedersen B, Tønnesen H. Preoperative alcohol cessation prior to elective surgery. *Cochrane Database Syst Rev*. 2012;(7):CD008343.
52. Fernandez AC, Claborn KR, Borsari B. A systematic review of behavioural interventions to reduce preoperative alcohol use. *Drug Alcohol Rev*. 2015;34(5):508-520.
53. Grønkjær M, Eliasen M, Skov-Ettrup LS, et al. Preoperative smoking status and postoperative complications: a systematic review and meta-analysis. *Ann Surg*. 2014;259(1):52-71.
54. Thomsen T, Villebro N, Møller AM. Interventions for preoperative smoking cessation. *Cochrane Database Syst Rev*. 2014;(3):CD002294.
55. Finlayson E, Maselli J, Steinman MA, Rothberg MB, Lindenauer PK, Auerbach AD. Inappropriate medication use in older adults undergoing surgery: a national study. *J Am Geriatr Soc*. 2011;59(11):2139-2144.

eTABLE A

Geriatric Depression Scale: Short Form

Choose the best answer for how you have felt over the past week:

1. Are you basically satisfied with your life? Yes/**No**
2. Have you dropped many of your activities and interests? **Yes**/No
3. Do you feel that your life is empty? **Yes**/No
4. Do you often get bored? **Yes**/No
5. Are you in good spirits most of the time? Yes/**No**
6. Are you afraid that something bad is going to happen to you? **Yes**/No
7. Do you feel happy most of the time? Yes/**No**
8. Do you often feel helpless? **Yes**/No
9. Do you prefer to stay at home, rather than going out and doing new things? **Yes**/No
10. Do you feel you have more problems with memory than most? **Yes**/No
11. Do you think it is wonderful to be alive now? Yes/**No**
12. Do you feel pretty worthless the way you are now? **Yes**/No
13. Do you feel full of energy? Yes/**No**
14. Do you feel that your situation is hopeless? **Yes**/No
15. Do you think that most people are better off than you are? **Yes**/No

Note: Answers in bold indicate depression. Score 1 point for each bolded answer. A score > 5 points is suggestive of depression. A score ≥ 10 points is almost always indicative of depression. A score > 5 points warrants a follow-up comprehensive assessment. Source: https://web.stanford.edu/~yesavage/GDS.html. This scale is in the public domain.

eTABLE B

Katz Index of Independence in Activities of Daily Living

Activities	Independence (1 point)*	Dependence (0 points)†	Score
Bathing	Bathes self completely or needs help in bathing only a single part of the body, such as the back, genital area, or disabled extremity	Needs help with bathing more than one part of the body, getting in or out of the bathtub or shower; requires total bathing assistance	_____
Dressing	Gets clothes from closets and drawers, and puts on clothes and outer garments complete with fasteners; may need help tying shoes	Needs help with dressing self or needs to be completely dressed	_____
Toileting	Goes to toilet, gets on and off, arranges clothes, cleans genital area without help	Needs help transferring to the toilet and cleaning self, or uses bedpan or commode	_____
Transferring	Moves in and out of bed or chair unassisted; mechanical transfer aids are acceptable	Needs help in moving from bed to chair or requires a complete transfer	_____
Fecal and urinary continence	Exercises complete self-control over urination and defecation	Is partially or totally incontinent of bowel or bladder	_____
Feeding	Gets food from plate into mouth without help; preparation of food may be done by another person	Needs partial or total help with feeding or requires parenteral feeding	_____
		Total points‡:	_____

*—No supervision, direction, or personal assistance.
†—With supervision, direction, personal assistance, or total care.
‡—Score of 6 = high (patient is independent); score of 0 = low (patient is very dependent).

Adapted with permission from Katz S, Downs TD, Cash HR, Grotz RC. Progress in development of the index of ADL. Gerontologist. *1970;10(1):23.*

eTABLE C

Lawton Instrumental Activities of Daily Living Scale (Self-Rated Version)

For each question, circle the number of points for the answer that best applies to your situation.

1. Can you use the telephone?	
Without help	3
With some help	2
Completely unable to use the telephone	1
2. Can you get to places that are out of walking distance?	
Without help	3
With some help	2
Completely unable to travel unless special arrangements are made	1
3. Can you go shopping for groceries?	
Without help	3
With some help	2
Completely unable to do any shopping	1
4. Can you prepare your own meals?	
Without help	3
With some help	2
Completely unable to prepare any meals	1
5. Can you do your own housework?	
Without help	3
With some help	2
Completely unable to do any housework	1
6. Can you do your own handyman work?	
Without help	3
With some help	2
Completely unable to do any handyman work	1
7. Can you do your own laundry?	
Without help	3
With some help	2
Completely unable to do any laundry	1
8a. Do you use any medications?	
Yes (answer question 8b)	1
No (answer question 8c)	2
8b. Do you take your own medication?	
Without help (in the right doses at the right time)	3
With some help (take medication if someone prepares it for you or reminds you to take it)	2
Completely unable to take own medication	1
8c. If you had to take medication, could you do it?	
Without help (in the right doses at the right time)	3
With some help (take medication if someone prepares it for you or reminds you to take it)	2
Completely unable to take own medication	1
9. Can you manage your own money?	
Without help	3
With some help	2
Completely unable to handle money	1

Note: Scores have meaning only for a particular patient (e.g., declining scores over time reveal deterioration). Some questions may be patient-specific and can be modified by the interviewer.

Information from Lawton MP, Brody EM. Assessment of older people: self-maintaining and instrumental activities of daily living. Gerontologist. *1969;9(3):179-186.*