



SECTION I. Cognitive and Behavioral Disorders

A. Cognitive Impairment and Dementia

In 2002, the prevalence of cognitive impairment and dementia among individuals 71 years and older in the U.S. were estimated at 22.2% and 13.9%, respectively.^{7,8} The prevalence of dementia increases exponentially with increasing age older than 65 years.⁹ As the proportion of Americans 85 years and older grows, the number of people living with dementia is projected to rise dramatically.¹⁰

Preexisting cognitive impairment strongly predicts postoperative delirium,¹¹⁻¹⁵ which is associated with worse surgical outcomes, including longer hospital stays, increased risk of perioperative mortality,^{11,13} and postoperative functional decline.¹⁴

ASSESSING COGNITIVE ABILITY

Cognitive Ability:

For an patient older than age 65 without a known history of cognitive impairment or dementia, a history and cognitive assessment, such as the Mini-Cog (see below), are essential.

If possible, a knowledgeable informant, such as a spouse or a family member, should be interviewed about the evolution of any cognitive or functional decline in the patient.¹⁶

If the patient has experienced a decline, they should be referred for further evaluation to a primary care physician, geriatrician, or mental health specialist.

Documentation of the patient's baseline cognitive status.^{17,18}

The cognitive assessment should be performed early in the patient evaluation because an evidence of cognitive impairment or dementia may indicate that subsequent assessment of functional status and/or medication use may be unreliable.

COGNITIVE ASSESSMENT: MINI-COG

Mini-Cog: 3 Item Recall and Clock Draw ¹⁹

1. GET THE PATIENT'S ATTENTION, THEN SAY:

la g i g a h e e d h a l a e e b e a d l a e.
The d a e Banana Sunrise Chair
Plea e a h e f e .

Give the patient 3 tries to repeat the words. If unable after 3 tries, go to next item.

2. SAY ALL THE FOLLOWING PHRASES IN THE ORDER INDICATED:



C. Depression

A recent study estimates the prevalence of depression among the U.S. population 71 years and older to be 11%.²³ In the general elderly population, major depression occurs in 1% to 3%, with an additional 8% to

D. Risk Factors for Postoperative Delirium

SECTION II. Cardiac Evaluation

For noncardiac surgery, studies describe major perioperative cardiac complications rates at 2% for unselected patients⁴⁷ and 3.9% for patients with or at risk of cardiac disease.⁴⁸ The rates increase 5% for high-cardiac-risk patients.⁴⁷⁻⁵⁰ Postoperative myocardial infarction (MI) is associated with hospital mortality rates of 15%–25%; patients experiencing nonfatal perioperative MI are at greater risk for cardiovascular death and nonfatal MI during the 6 months after a surgical operation.⁴⁸

SECTION III. Pulmonar Evaluation

Postoperative pulmonary complications (PPCs) are common and contribute significantly to overall mortality.⁵³ In a systematic review of PPCs in patients undergoing noncardiac surgery, the rate of PPCs across all the studies was 6.8%.⁵⁴ In the same review, subsets showed median PPC rates of 14% and 5% at sites 65 years and 70 years, respectively.

Although traditionally greater emphasis has been placed on cardiac risk assessment, postoperative pulmonary complications have similar prevalence to cardiac adverse events.⁵⁴⁻⁵⁶

SECTION IV. Functional / Performance Status

In one prospective study of elderly patients undergoing major surgical operations requiring ICU stay, functional independence was the strongest predictor of postoperative 6-month mortality.⁷⁸ Another study of Veterans Administration (VA) patients >80 years old showed that 30-day mortality was more strongly predicted by functional status than age.⁷⁹ Impaired mobility in elderly patients has also been linked to increased risk of postoperative delirium,^{31,80} and surgical site infections with SSI.^{81,82} In a study of elderly surgical patients, preoperative GCS, and the ASA class were the strongest predictors for requiring postoperative discharge institutionalization.⁸³ In addition, preoperative functional status strongly predicts better recovery and shorter recovery periods for activities of daily living (ADL) and instrumental activities of daily living (IADL) following major abdominal surgery.⁸⁴

1. Assess patient's ability to perform daily activities (functional status).

ASSESSING BASELINE AND CURRENT FUNCTIONAL STATUS IN AMBULATORY PATIENTS

Short Simple Screening Test for Functional Assessment 21,85

Ask the patient the following four questions:

1. Can you get up from bed by yourself?
2. Can you dress and bathe by yourself?
3. Can you take a walk?
4. Can you do your housework?

Interpretation of Functional Screening Test

If NO to any of these questions, more in-depth evaluation should be performed, including full screening of ADLs and IADLs.

Decision for documentation and/or referral to occupational therapy and/or physical therapy and proactive discharge planning.

NOTE: Patient's responses may not be reliable in the presence of cognitive impairment or dementia.

2. Document each visit, hearing glasses as appropriate.
3. Inquire about history of falls (Have you fallen in the past?).
4. Evaluate the patient for limitations in gait and mobility and determine risk for falls.

ASSESSING GAIT AND MOBILITY IMPAIRMENT AND FALL RISK IN AMBULATORY PATIENTS

Timed Up and Go Test (TUGT) ⁸⁶⁻⁸⁸

Patients should sit in a standard armchair with a line 10 feet in length in front of the chair. They should use standard footwear and walking aids and should not receive any assistance.

Have the patient perform the following commands:

1. Rise from the chair (if possible, without using the armrests)
2. Walk to the end of the 10-foot line
3. Turn
4. Return to the chair
5. Sit down again

Interpretation of TUGT

A score of more than 15 seconds to complete the test is at high risk for falls. Consider preoperative referral to physical therapy for more detailed gait assessment.

Section VI. Nutritional Status

Rates of malnutrition were found to be 5.8% among elderly individuals in the community, 13.8% in nursing homes, 38.7% in hospitals, and 50.5% in rehabilitation.⁹³

Poor nutritional status is associated with increased risk of postoperative adverse events, mostly infectious complications (for example, surgical site infections, pneumonia, urinary tract infections, and so on) and wound complications (for example, dehiscence and anastomotic leaks), and increased length of stay for patients undergoing elective gastrointestinal surgery.⁹⁴

1. Document height and weight and calculate body mass index (BMI).^{20,21}
2. Measure baseline serum albumin, prealbumin levels.^{20,21}
3. Inquire about unintentional weight loss in the last year.

SCREENING FOR SEVERE NUTRITIONAL RISK ⁹⁵

Risk Factors for Severe Nutritional Risk

BMI < 18.5 g/m²

Serum albumin < 3.0 g/L (with no evidence of hepatic or renal dysfunction)

Unintentional weight loss > 10%–15% within 6 months

Interpretation of Nutritional Screening

If YES to any above criterion, then the patient is at severe nutritional risk and should, if feasible, undergo a full nutritional assessment by a dietitian to design a perioperative

nutritional support plan.

4. Consider preoperative nutritional support for patients at severe nutritional risk (see Appendix IV).

Section VII. Medication Management

1. Review and document the patient's complete medication lists, including use of nonprescription agents (over-the-counter, over-the-counter, off-label, herbal, SAs, vitamins, supplements, and herbal products).⁹⁶

NOTE: Patient's responses may not be reliable in the presence of cognitive impairment or dementia.

2. Identify medications that should be discontinued prior to a surgical operation and medications that should be avoided to minimize adverse effects of medications through drug-drug interaction or substitutions.

GUIDELINES FOR MODIFYING PERIOPERATIVE MEDICATIONS

Discontinue before surgery:

Nonessential medications that increase surgical risk should be discontinued.⁹⁶

Medications with potential for drug interactions with anesthesia should be discontinued or substituted.⁹⁶

See Beers Criteria (see Appendix V) for an additional list of medications that may need to be discontinued perioperatively.⁹⁷

Herbal medications should be stopped at least 7 days before a surgical operation due to uncertainty of contents.⁹⁶ See Appendix VI for more specific recommendations.

Continue perioperatively:

Medications with high fall potential, including selective serotonin reuptake inhibitors

3. Consider which medications should be started preoperatively to reduce perioperative risks of adverse events (cardiac, stroke, and so on).

ACC/AHA GUIDELINES FOR PERIOPERATIVE BETA BLOCKERS ^{21,52}

Summary of Recommendations on Beta Blockers

Indications: The guidelines support administration of beta blockers to:

Patients who are already on beta blockers, particularly those with preoperative cardiac indications for these medications (such as arrhythmia or history of myocardial infarction).

Patients undergoing intermediate risk or vascular surgery with known coronary artery disease or with multiple clinical risk factors for ischemic heart disease.

Initiation and Titration:

If beta blockers are indicated, when feasible, they should be started at least a few days before elective surgery, titrated to a heart rate of 60–80 beats/minute in the absence of hypotension. Titration and control with beta blockers should continue during the intraoperative and postoperative periods.

Discontinuation:

Beta blockers should be tapered off slowly to minimize risk of arrhythmias.

A href="#">The following table summarizes the ACC/AHA guideline recommendations for high-dose beta-blocker therapy in patients with preoperative cardiac risk factors. See Appendix VII for full recommendations.

See Appendix VII for full recommendations.

INITIATION OF STATIN THERAPY ^{21,52,99}

Recommendation on Statins

Preoperative statins should be started as soon as possible prior to a surgical operation for patients (Recommendation on Statin Therapy (3cR)-2.1(C)-5.1(I)|1.9(A)-8;T6_0-1.2 TD.0074 FtatinTaTc 04)53cR

4. Adjust doses of medications for renal function

Older patients are at greater risk for impaired renal function and chronic kidney disease. Since man

Section IX. Preoperative Testing

Over the past few decades, a number of studies have highlighted the relative low yield of routine preoperative screening and the high aggregate cost from both the direct cost of tests and the subsequent studies for a normal result. The reports have shown that many of the screening tests produce low rates of abnormal values in asymptomatic patients, are unlikely to change clinical management for the patient with a normal value, do not strongly predict good or a worse outcome, or are subject to a combination of these limitations.^{21,111-113,114,115}

The studies have recommended against a routine pattern of preoperative screening tests,^{21,111,112,114-116} or ones based on age criteria alone.^{116,117} Instead, the studies recommend selective diagnostic tests in higher-risk patient populations, such as the elderly, those with a history of falls, or those with a history of a fall, a history of a fall, or a history of a fall.^{21,111,112,115-118}

Most studies have suggested that the preoperative tests should be performed within 30 days of the operation.²⁰ One study, however, has shown that normal laboratory values one up to 4 months prior to a surgical operation could be used safely as preoperative tests as long as no substantial interval change in the patient's clinical status has occurred.^{112,118}



RECOMMENDED PREOPERATIVE TESTS FOR
SELECTED GERIATRIC SURGICAL PATIENTS

Preoperative Tests	Indications
White Blood Count (BC)	NOT RECO ¹ ENDED for routine preoperative screening. ^{2,1.e.sca(o)-2.170 m0 t-112(E)-23(o)-2.170 m0 3 cm 34 1 29(e)-h}

RECOMMENDED PREOPERATIVE TESTS FOR
SELECTED GERIATRIC SURGICAL PATIENTS

Preoperative Tests	Indications
Pulmonary Function Tests (PFT)	<p>NOT RECOMMENDED for routine preoperative screening.^{21,72,113,123}</p> <p>Recommended for patients undergoing lung resection.^{21,72,124}</p> <p>For patients not undergoing thoracic surgery, PFTs are recommended for patients who:^{54,123}</p> <ul style="list-style-type: none"> Have poorly characterized dyspnea or exercise intolerance and diagnostic uncertainty exists between a cardiac or pulmonary limitation and simple deconditioning. Have obstructive lung disease if it is not clear from the clinical evaluation if patients are at the best possible baseline.
Noninvasive Stress	

Appendices

APPENDIX I

Patient's Decision Making Capacity

APPENDIX II

Cardiac Evaluation

APPENDIX III

Frailty Score

APPENDIX IV

Recommendations for Preoperative Nutritional Support

APPENDIX V



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APPENDIX IV. Recommendations for Preoperative Nutritional Support

PREOPERATIVE INTERVENTIONS FOR MALNUTRITION

ESPEN Recommendations ^{95,126}

Use nutritional support in patients with severe nutritional risk for 10–14 days prior to a major surgical operation even if the operation has to be delayed (Grade A).

Initiate nutritional support (preferably the enteral route if possible) without delay:

Even in patients without obvious under-nutrition, if it is anticipated that the patient will be unable to eat for more than 7 days perioperatively (Grade C).

In patients who cannot maintain oral intake above 60% of recommended intake for more than 10 days (Grade C).

Consider combination with parenteral nutrition in patients in whom there is an indication for nutritional support and in whom energy needs cannot be met (<60% of caloric requirement) via the enteral route (Grade C).

Encourage patients who do not meet their energy needs from normal food to take oral nutritional supplements during the preoperative period (Grade C).

Administer preoperative enteral nutrition preferably before admission to the hospital (Grade C).

Preoperative parenteral nutrition is indicated in several undernourished patients who cannot tolerate oral or enteral feeds for 7–10 days preoperatively (Grade A).

NOTE: The enteral route is preferred except for the following contraindications: Intestinal obstructions or ileus, severe shock, intestinal ischemia.

Other Recommendations

Vitamin supplementation for alcohol-related malnourished patient: B12 and folate,²¹ thiamine.

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DRUGS WITH STRONG ANTICHOLINERGIC PROPERTIES

Antihistamines

Brompheniramine
Carinoamine
Chlorpheniramine
Clemastine
Cproheptaine
Dimenhirinate
Diphenhydramine
Hydroxyzine
Loratadine
Fexofenadine

Anti-Parkinson Agents

Bentropine
Trihexyphenidyl

Antidepressants

Amitriptyline
Amoxapine
Clomipramine
Desipramine
Doxepin
Imipramine
Nortriptyline
Paroxetine
Protriptyline
Trimipramine

Antipsychotics

Chlorpromazine
Clozapine
Fluphenazine
Loxapine
Olanzapine
Perphenazine
Pimozide
Prochlorperazine
Promethazine
Thioridazine
Thiothixene
Zuclopentixol

Antimuscarinics (Urinary Incontinence)

Darifenacin
Fesoterodine
Flavoxate
Oxybutynin
Solifenacin
Tolterodine
Trospium

Antispasmodics

Atropine products
Belladonna alkaloids
Dicyclomine
Homatropine
Hyoscine products
Loperamide
Propantheline
Scopolamine

Skeletal Muscle Relaxants

Carisoprodol
Cyclobenzaprine
Orphenadrine
Tizanidine

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