

## **BUMCT PAC Handbook**

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Welcome to the new and improved Pre Anesthesia Clinic (PAC). We are now located on the North Campus adjacent to the Cancer Center clinics. Traveling north on Campbell from the University Hospital, turn east on Allen (two blocks north of Prince). Turn left between the clinic building and the Ronald McDonald House to the parking garage. The main entrance to the new clinic building is on the north side of the building. When you enter the building you will pass through a coffee shop to the front hallway. We are to the left, just past the Sonora Quest Laboratory. You will share an office with the faculty member rather than a room full of nurses phone screening patients

This should be considered a remote rotation. Your duty hours will be from 0800 (after Grand Rounds Wednesdays) to approximately 1630 hours, Monday through Friday. A major part of your experience will be answering nurses' questions as well as seeing the patients we physically see in the clinic. Now that we are settled into the new facility with all other clinics, we hope to be able to eliminate obstacles that currently prevent us from seeing walk-ins to be screened prior to being scheduled for their procedures.

The PAC is a collaborative endeavor involving Nursing Service, administration, Surgery, and Medicine. Eventually we hope to be involved also with Physical Therapy, and Nutrition services. Our primary functions are to minimize day of surgery delays and to do appropriate risk assessments. There are essentially four types of risk assessments. The first is environmental risks. These are based on location, architecture, equipment, and staffing support. Except for ambulatory surgical centers, these problems are handled at the operative site. A second category is anesthesia risks, such as history of malignant hyperthermia or difficult airways, which will affect choice of anesthetic agents and techniques. Finally, there are surgical risks and patient risks, which will be discussed below.

A number of excellent reference books are available for your use:

**Reference Material Available**

- 1. Anesthesia and Co-Existing Disease, 6th Ed.**
- 2. Anesthesia and Uncommon Diseases, 6th Ed.**
- 3. Barash: Clinical Anesthesia, 8th Ed.**
- 4. Evidence-Based Practice of Anesthesiology, 3rd Ed.**
- 5. Harrison's Internal Medicine, 7th Ed.**
- 6. Miller's Anesthesia, 8th Ed.**
- 7. Perioperative Medicine.**
- 8. Perioperative Medicine for the Junior Clinician.**
- 9. Preoperative Assessment & Management: 2nd Ed.**
- 10. Preoperative Evaluation.**
- 11. Other miscellaneous references.**

<b>Preoperative Tests</b>	<b>Indications</b>
<b>Hemoglobin</b>	<ul style="list-style-type: none"> <li>• Recommended for geriatric patients (age 65 and older) scheduled for elevated risk procedure.</li> <li>• Recommended for patients scheduled for procedures with anticipated major blood loss and may require transfusion.</li> <li>• Recommended for patients with history or physical exam suggesting severe anemia: <ul style="list-style-type: none"> <li>* History of profound fatigue, anemia, malignancy, CV disease, renal disease, or respiratory disease.</li> <li>* On exam, resting tachycardia or conjunctival pallor.</li> </ul> </li> </ul>
<b>Renal Function Tests (BUN, Cr)</b>	<p>Recommended for:</p> <ul style="list-style-type: none"> <li>• <input type="checkbox"/> Geriatric patients.</li> </ul> <p>Consider for:</p> <ul style="list-style-type: none"> <li>• <input type="checkbox"/> ASA 3 and higher patients scheduled for high risk procedures.</li> <li>• <input type="checkbox"/> Patients with significant renal disease, diabetes, hypertension, CV disease, or taking NSAIDs, ARBs, or ACEIs.</li> </ul>
<b>Serum Albumin</b>	<p>Recommended for geriatric patients.</p> <p>Consider for ASA 3 and higher patients:</p> <ul style="list-style-type: none"> <li>• <input type="checkbox"/> With significant liver disease, multiple serious chronic illnesses, and recent major illness scheduled for elevated risk procedure.</li> <li>• <input type="checkbox"/> Likely to have malnutrition (BMI less than 18.6; unintentional weight loss of 10 or more pounds or 5-10% total body weight)</li> </ul>
<b>CBC</b>	NOT RECOMMENDED for routine preoperative testing.
<b>Coags and platelet count</b>	NOT RECOMMENDED for routine preoperative testing. Recommended for patients with history of bleeding disorders or taking anticoagulants. PT should be checked in patients with malnutrition, malabsorption or significant liver disease.
<b>Electrolytes</b>	NOT RECOMMENDED for routine preoperative testing. Consider in patients with renal insufficiency, congestive heart failure, those taking diuretics, digoxin, ACEI, ARBs.
<b>Serum glucose and Hba1c</b>	NOT RECOMMENDED for routine preoperative screening. Recommended in known or suspected diabetics.
<b>Urinalysis</b>	NOT RECOMMENDED for routine preoperative screening. Recommended for patients: <ul style="list-style-type: none"> <li>• with symptoms consistent with urinary tract infection.</li> <li>• Undergoing urogenital procedures.</li> </ul> <p>Consider for surgeries involving prosthesis.</p>
<b>Chest XRay</b>	NOT RECOMMENDED for routine preoperative screening. Recommended for patients <ul style="list-style-type: none"> <li>• with suspected Pneumo/hemo thorax.</li> <li>• scheduled for thoracic or mediastinal procedures.</li> <li>• with suspected significant trachea/bronchial abnormalities that might affect tracheal intubation.</li> <li>• with symptoms suggesting undiagnosed congenital heart disease or CHF.</li> </ul>
<b>PFTs</b>	NOT RECOMMENDED for routine preoperative screening.

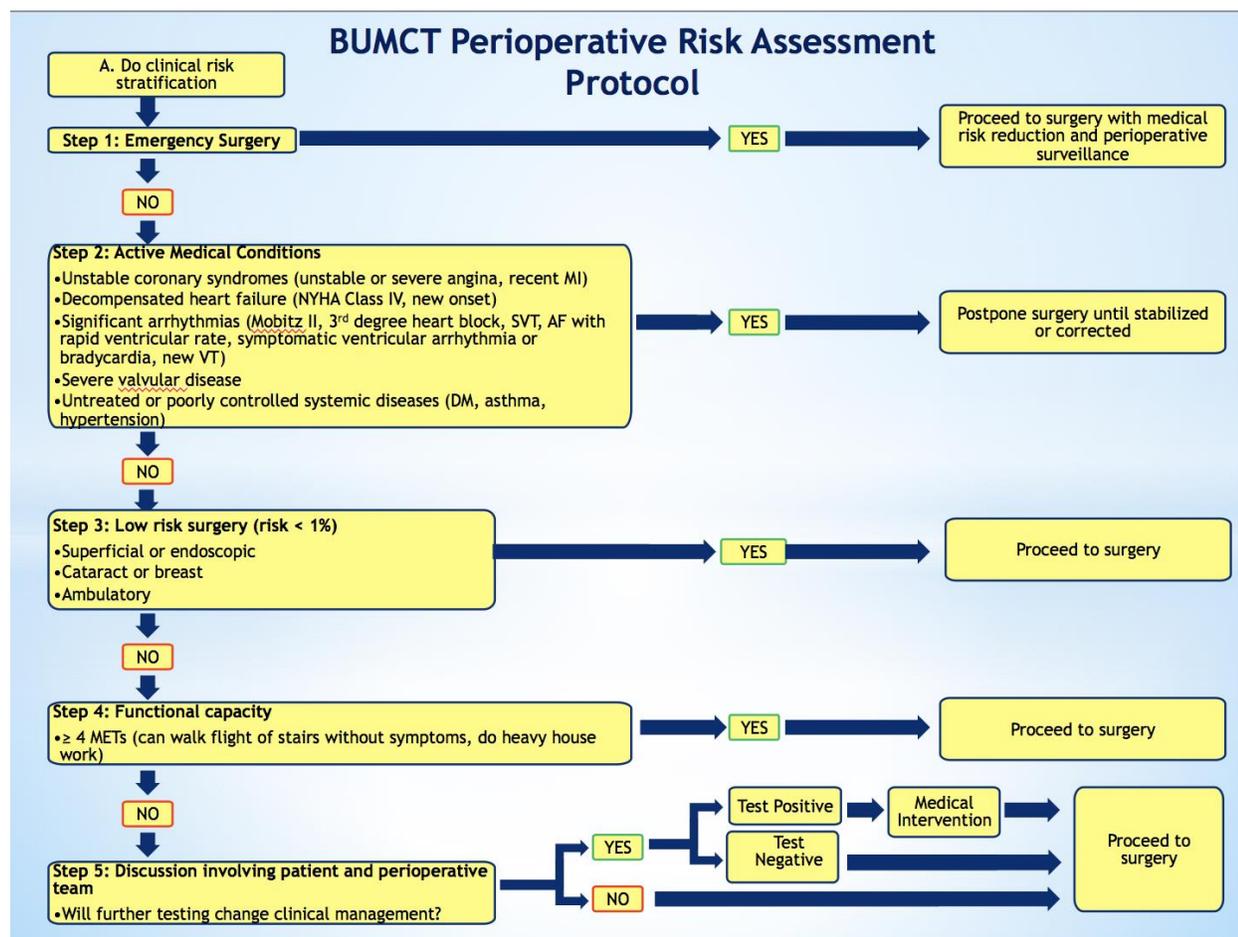
	<i>Recommended for;</i> <ul style="list-style-type: none"> <li>• <i>patients scheduled for lung resection.</i></li> <li>• <i>patients with unstable pulmonary disease.</i></li> </ul>
<b>Noninvasive Stress Testing</b>	<i>NOT RECOMMENDED for:</i> <ul style="list-style-type: none"> <li>• <i>routine preoperative screening.</i></li> <li>• <i>Patients who can tolerate 4 METs of activity.</i></li> <li>• <i>Scheduled for low risk procedures.</i></li> </ul> <i>Consider for patients with poor functional capacity (less than 4 METs) who have 3 or more clinical risk factors (high risk procedure, coronary artery disease, hx of CHF, cerebral vascular disease, diabetes, creatinine &gt;2) <u>only if it will change management.</u></i>

These guidelines are consistent with recommendations of the American Society of anesthesiologists and the national "Choosing Wisely" initiative.

The most common risk assessment we do follows the guidelines published by the American Heart Association/American College of Cardiologists. Below is the step-by-step protocol based on the AHA/ACC 2014 guidelines modified for BUMC-T with the help of the Cardiology Department.

## BUMC Perioperative Risk Assessment Protocol

Back in the 1770s, Dr. John Gregory used to tell the medical students at Edinburgh that the best therapeutic plan is not the ideal plan, but as close to ideal as the patient can, and will, comply with. The AHA/ACC guidelines were developed for patients who live in Paradise, and we practice in South Tucson, so we must adapt to the situation. Also, since the 2007 version of the guidelines, one of the main goals is to drastically reduce the volume of pre-operative cardiac consultations and testing.



The first thing we do for every patient is a clinical risk assessment. There are several available, they measure different risks, and they each have pros and cons. The ASA PS is the oldest and has passed the test of time. It measures overall patient risk only; it is ambiguous, and certainly not exact.

Inter-rater agreement is improved if all raters follow the ASA update using examples. Note that with this statement, there are going to be fewer ASA PS IVs.

**Table 2 : Current Definitions and Examples of ASA Physical Status Class**  
([www.asahq.org/resources/clinical-information/asa-physical-status-classification-system](http://www.asahq.org/resources/clinical-information/asa-physical-status-classification-system))

ASA PS Classification	Definition	Examples, including, but not limited to:
ASA I	A normal healthy patient	Healthy, non-smoking, no or minimal alcohol use
ASA II	A patient with mild systemic disease	Mild diseases only without substantive functional limitations. Examples include (but not limited to): current smoker, social alcohol drinker, pregnancy, obesity (30<BMI<40), well-controlled DM/HTN, mild lung disease
ASA III	A patient with severe systemic disease	Substantive functional limitations; One or more moderate to severe diseases. Examples include (but not limited to): poorly controlled DM or HTN, COPD, morbid obesity (BMI ≥40), active hepatitis, Alcohol dependence or abuse, implanted pacemaker, moderate reduction in ejection fraction, ESRD undergoing regularly scheduled dialysis, premature infant PCA < 60 weeks, history (>3 months) of MI, CVA, TIA, or CAD/stents.
ASA IV	A patient with severe systemic disease that is a constant threat to life	Examples include (but not limited to): Recent (< 3 months) history of MI, CVA, TIA, or CAD/stents. Ongoing cardiac ischemia or severe valve dysfunction, severe reduction of ejection fraction, sepsis, DIC, ARD or ESRD not undergoing regularly scheduled dialysis
ASA V	A moribund patient who is not expected to survive without the operation	Examples include (but not limited to): Ruptured abdominal/thoracic aneurysm, massive trauma, intracranial bleed with mass effect, ischemic bowel in the face of significant cardiac pathology or multiple organ/system dysfunction
ASA VI	A declared brain-dead patient whose organs are being removed for donor purposes	

\*The addition of "E" denotes emergency surgery: (An emergency is defined as existing when delay in treatment of the patient would lead to a significant increase in the threat to life or body part)

Another helpful assessment in many patients is the Revised Cardiac Risk Index. This estimates the risk for a Major Adverse Cardiac Event in the peri-operative period. There are six risk factors valued a one point each. Obesity, smoking, and high cholesterol are not considered to be risk factors. These two risk assessments mesh like this and expand the scope of the assessment.

**Do clinical risk stratification**

ASA PS	% Risk	Risk	RCRI	% Risk
1	0	Low	0	~0.5%
2	~1%	Low	1	~1%
3	~5%	Intermediate	2	~5%
4	~10%	Elevated	≥3	~10%

Revised Cardiac Risk Index  
 High Risk Surgery  
 Coronary Artery Disease  
 History of Heart Failure  
 History of CVA or TIA  
 Diabetes Mellitus  
 Creatinine >2

The third assessment we have to consider is the procedure itself. In a tertiary care, teaching facility many procedures will be high risk.

### Procedure Risk Stratification

**Low risk surgery:** Ambulatory surgery, endoscopic and superficial procedures, cataract surgery, breast surgery-cardiac morbidity generally below 1%

**Intermediate risk surgery:** lower abdominal surgery, carotid endarterectomy, endovascular procedure of extremities, head and neck surgery, orthopedic surgery, prostate surgery- cardiac morbidity between 1%-5%.

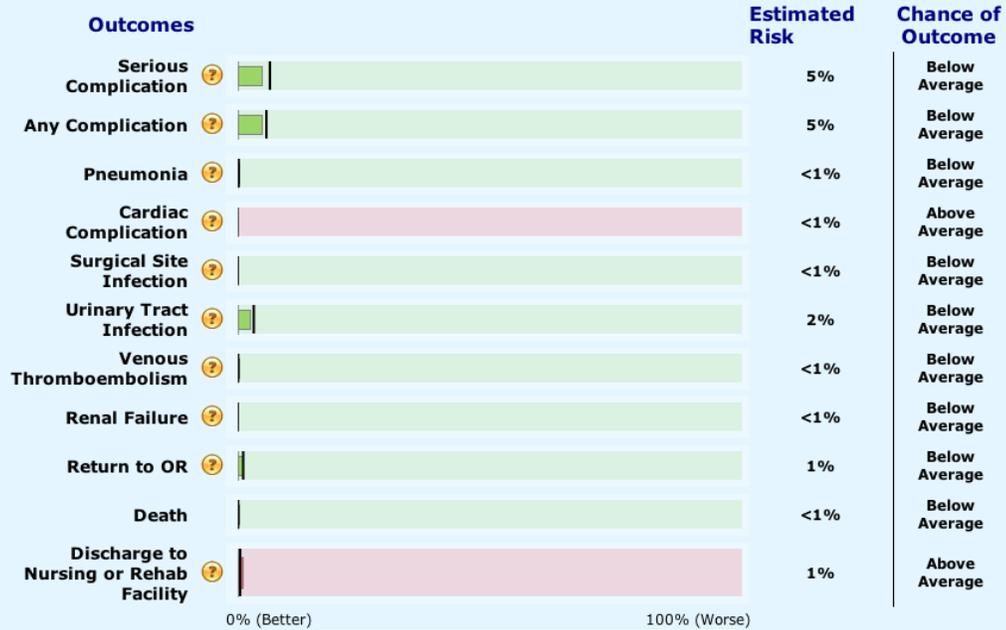
**High risk surgery:** Aortic, major vascular surgery, peripheral vascular surgery, upper abdominal intraperitoneal and intrathoracic procedures, surgery lasting longer than 3.5 hours, emergency surgery, any associated with major blood loss and large fluid shifts, most intracranial surgery-cardiac morbidity greater than 5%.

If, when you combine the results of the three different risk stratification tools, the outcome is still ambiguous, the Gupta index or NSQIP Risk Calculator can be helpful. The NSQIP calculator takes several factors into consideration and may help clear up a murky situation.

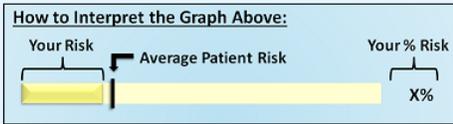
**Procedure**  
52648 - Laser vaporization of prostate, including control of postoperative bleeding, complete (vasectomy, meatotomy, cystourethroscopy, urethral calibration and/or dilation, internal urethrotomy and transurethral resection of prostate are included if performed)

**Risk Factors**  
Age: 75-84, Male, HTN

[Change Patient Risk Factors](#)



**Predicted Length of Hospital Stay: 0.5 days**

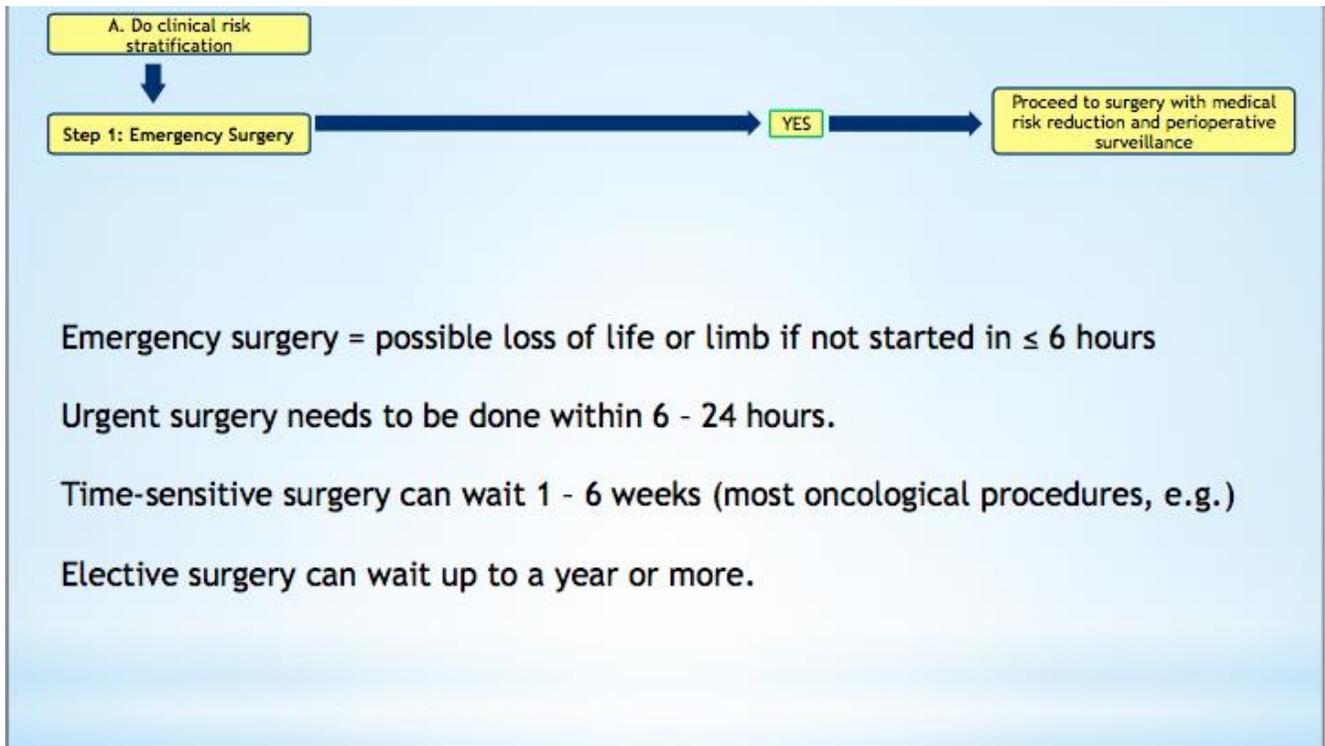


**Surgeon Adjustment of Risks**

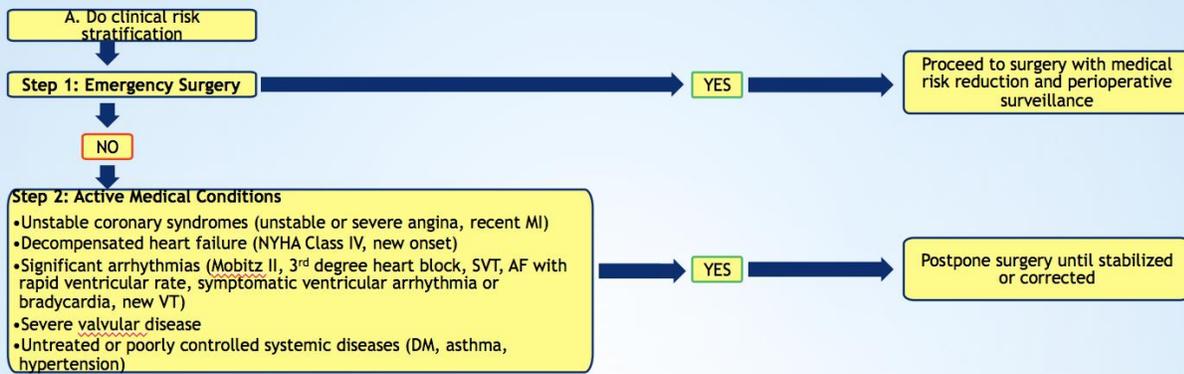
This will need to be used infrequently, but surgeons may adjust the estimated risks if they feel the calculated risks are underestimated. This should only be done if the reason for the increased risks was NOT already entered into the risk calculator.

1 - No adjustment necessary

Having done the initial risk stratification, the next consideration is whether or not the procedure is an emergency. Here are the AHA/ACC definitions—I also include loss of vision along with life or limb. Each step down gives you more time to optimize the patient's condition. If the answer is yes, you have to suck it up and optimize on the fly.



If the case is not an emergency, the next step is to determine whether or not the patient has an active medical condition. Active cardiac conditions are listed here and should be treated and controlled prior to the procedure. A recent MI is within 60 days and an acute MI is within 7 days. Significant arrhythmias are associated with hemodynamic instability. Severe valvular diseases are primarily aortic and mitral stenosis or insufficiency. The cardiologists and I agreed that our patients have more than just cardiac problems so we included major non-cardiac diseases.

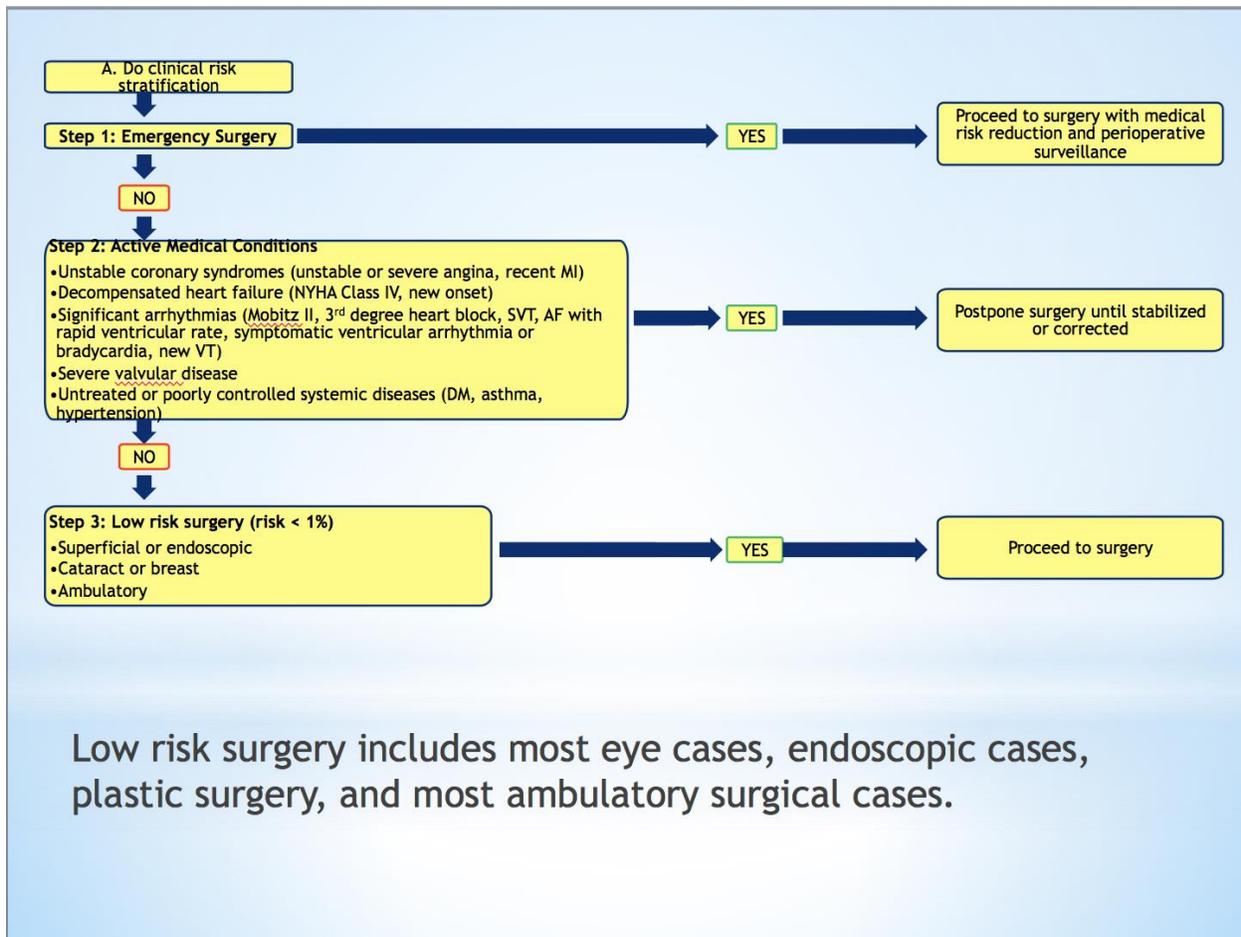


Patients with active cardiac conditions must be treated and controlled using appropriate AHA/ACC clinical practice guidelines. They should be considered for time-sensitive or elective surgery only when stable.

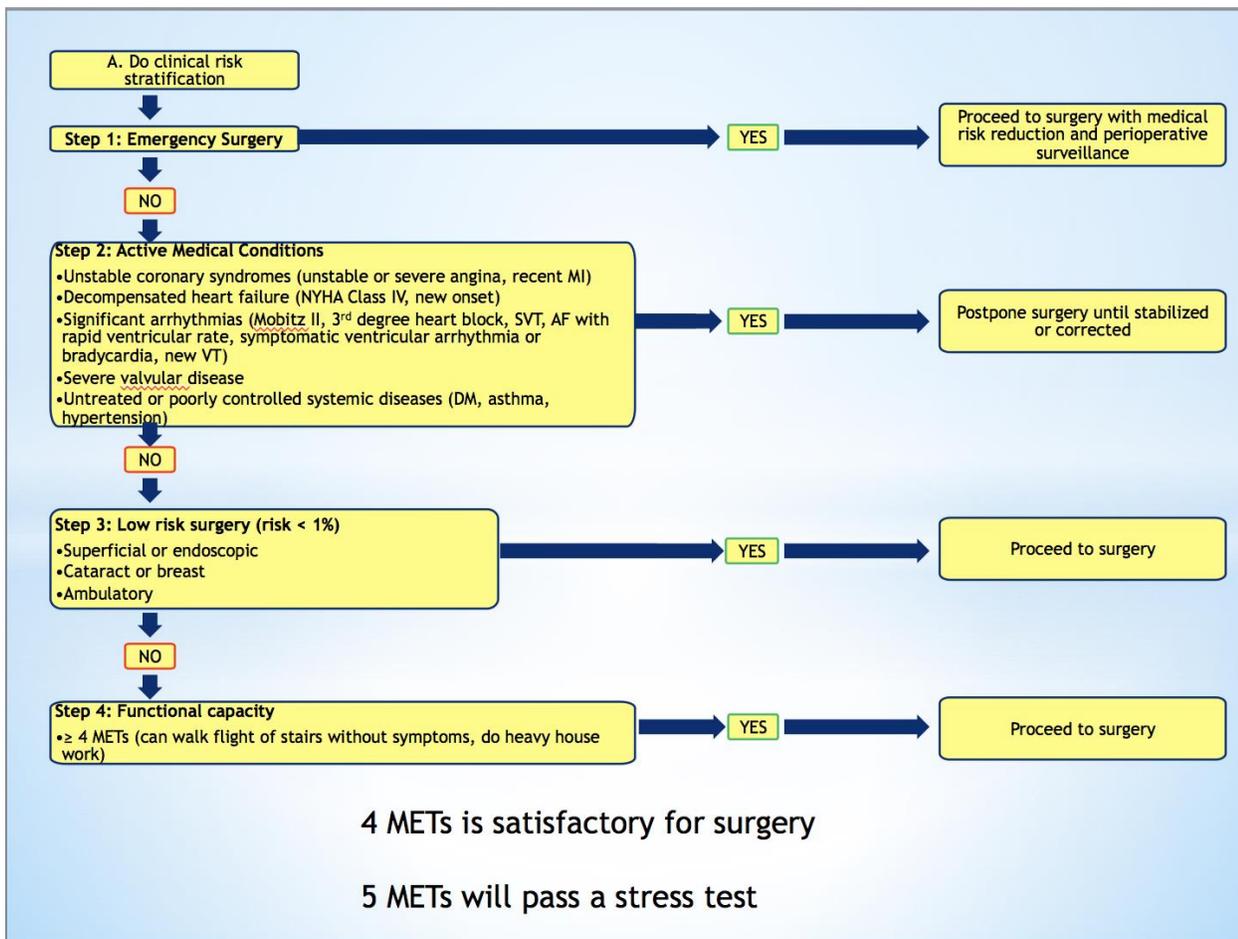
Patients with active non-cardiac conditions, such as poorly-controlled asthma, pneumonia, diabetes mellitus, hypertension, renal failure, etc. should be stabilized before elective surgery.

(Recent MI is within 60 days, acute MI is within 7 days)

If there are no active medical conditions, is the procedure low risk? If the answer is yes, proceed to surgery. There is no clinical indication for further workup.



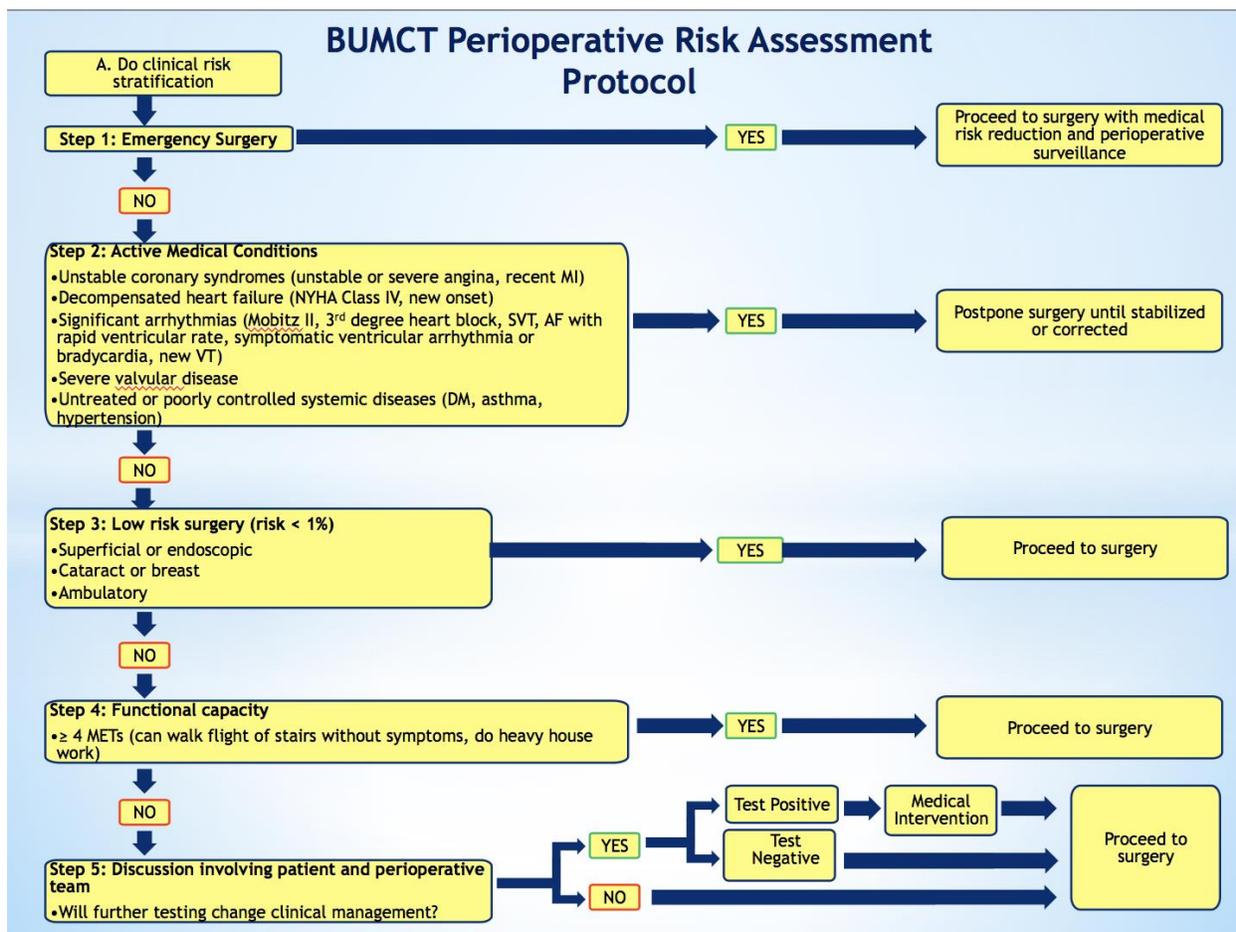
If the procedure is not low risk, try to estimate the patient’s functional capacity. The most common standard is can the patient climb a flight of stairs without developing symptoms of myocardial ischemia—shortness of breath doesn’t count. This has been a standard for at least 50 or 60 years.



There are many questionnaires that can help estimate exercise tolerance; this one from Duke is what we use to estimate functional capacity.

Activity	Weight (in METs)
Can you...	
1. Take care of yourself, that is, eating, dressing, bathing, or using the toilet?	2.75
2. Walk indoors, such as around your house?	1.75
3. Walk a block or 2 on level ground?	2.75
4. Climb a flight of stairs or walk up a hill?	5.50
5. Run a short distance?	8.00
6. Do light work around the house like dusting or washing dishes?	2.70
7. Do moderate work around the house like vacuuming, sweeping floors, or carrying groceries?	3.50
8. Do heavy work around the house like scrubbing floors or lifting or moving heavy furniture?	8.00
9. Do yardwork like raking leaves, weeding, or pushing a power mower?	4.50
10. Have sexual relations?	5.25
11. Participate in moderate recreational activities like golf, bowling, dancing, doubles tennis, or throwing a baseball or football?	6.00
12. Participate in strenuous sports like swimming, singles tennis, football, basketball, or skiing?	7.50

If the patient can generate 4 METs, proceed to surgery—no cardiac workup is indicated. However, if the patient cannot or will not generate 4 METs, we have a problem. At this point, there should be a discussion with the patient and the peri-operative team about further testing, keeping in mind (1) that there are major consequences to any decision, (2) that there very few indications for CABG, and (3) except for those specific indications, there is no evidence to suggest that interventional treatment of coronary artery disease is any better or worse than medical treatment.



Before the 2014 guidelines adopted the revised cardiac risk index, the general considerations for advising cardiac consultation are shown here.

### Cardiac Risk Index

- Coronary Artery Disease
- History of Heart Failure
- History of CVA or TIA
- Diabetes Mellitus
- Creatinine >2

Consider cardiac consultation if patient has 3 or more risk factors, is scheduled for high risk procedure, and then, only if it will change clinical management.

If the patient is scheduled for an intermediate risk procedure they should proceed to surgery with rate control. If scheduled for high risk surgery, consider cardiac consultation only if the patient has 3 or more cardiac risk factors AND if a positive result will change clinical management. What do they mean by changing clinical management? Here it is

## Perioperative interventions based on cardiac evaluation

Decision to forego surgery

Modification of the surgical procedure

Delay case for treatment of unstable symptoms

Modification of perioperative medical therapy

Initiation of beta-blockers, statins,  $\alpha$ -2 agonists

Modification of postoperative monitoring (eg, ICU)

Coronary revascularization before noncardiac surgery

Modification of location of care

Consideration of palliative care

Appropriate allocation of transplant organs

What does the ASA have to say about this? Only consider consultation in high risk procedures.



American Society of Anesthesiologists

American Society of  
Anesthesiologists® 

**Five Things Physicians  
and Patients Should Question**

2

**Don't obtain baseline diagnostic cardiac testing (trans-thoracic/ esophageal echocardiography – TTE/TEE) or cardiac stress testing in asymptomatic stable patients with known cardiac disease (e.g., CAD, valvular disease) undergoing low or moderate risk non-cardiac surgery.**

Advances in cardiovascular medical management, particularly the introduction of perioperative beta-blockade and improvements in surgical and anesthetic techniques, have significantly decreased operative morbidity and mortality rates in noncardiac surgery. Surgical outcomes continue to improve causing the mortality rate of major surgeries to be low and the need for revascularization minimal. Consequently, the role of preoperative cardiac stress testing has been reduced to the identification of extremely high-risk patients, for instance, those with significant left main disease for which preoperative revascularization would be beneficial regardless of the impending procedure. In other words, testing may be appropriate if the results would change management prior to surgery, could change the decision of the patient to undergo surgery, or change the type of procedure that the surgeon will perform.

Here is the fine print enlarged and the main point emphasized.

Advances in cardiovascular medical management, particularly the introduction of perioperative beta-blockade and improvements in surgical and anesthetic techniques, have significantly decreased operative morbidity and mortality rates in noncardiac surgery. Surgical outcomes continue to improve causing the mortality rate of major surgeries to be low and the need for revascularization minimal. **Consequently, the role of preoperative cardiac stress testing has been reduced to the identification of extremely high-risk patients**, for instance, those with significant left main disease for which preoperative revascularization would be beneficial regardless of the impending procedure. In other words, testing may be appropriate if the results would change management prior to surgery, could change the decision of the patient to undergo surgery, or change the type of procedure that the surgeon will perform.

This is the official statement of the ASA in the Choosing Wisely Initiative. I have emphasized the key statement. The AHA/ACC and the ASA have come down firmly in including the patient and peri-operative team in the decision making loop and not doing things unilaterally.

Finally, a note about "cardiac clearances". Anesthesiology has been trying to eliminate this concept for at least 40 years, but we are complicit in the failure to do so, because we don't ask the correct questions for the consultant. "1. What is the cardiac diagnosis? 2. What is the patient's cardiac physiology? 3. Is the cardiac status

optimized? 4. If not what would it take to optimize it?" There are only two people who can give "cardiac clearance" for anesthesia: the patient and the one doing the anesthesia.

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Another risk assessment done for many patients is for Post Operative Nausea and Vomiting. Adults and children have different risk factors:

Adults:

- History of PONV/Motion Sickness (1 pt)
- Female (1 pt)
- Non-smoker (1 pt)
- Post-op opioids (1 pt)
- Emetogenic surgery: Abdominal, Breast, Gyn., Laparoscopy, Laparotomy, Maxillofacial, Neurologic, Ophthalmologic, Plastic surgery, Strabismus, Urologic (1 pt)

Children:

- Surgery > 30 min (1 pt)
- Age >3 (1 pt)
- Strabismus surgery (1 pt)
- Hx/Family Hx of PONV (1 pt)

0-2 risk factors=low-intermediate risk

3+ risk factors=high risk

Former resident Dr. Alex Fox developed a PONV protocol based on the 2016 recommendations of the American Society for Enhanced Recovery:

# PONV Protocol\*

## STEP 1: IDENTIFY RISK FACTORS

### Adults

History of PONV/Motion Sickness (1 pt)  
Female (1 pt)  
Non-smoker (1 pt)  
Post-op opioids (1 pt)  
Emetogenic surgery (Abdominal, Breast, Gyn.,  
Laparoscopy, Laparotomy, Maxillofacial,  
Neurologic, Ophthalmologic, Plastic surgery,  
Strabismus, Urologic) (1 pt)

### Children

Surgery > 30 min (1 pt)  
Age >3 (1 pt)  
Strabismus surgery (1 pt)  
Hx/Family Hx of PONV (1 pt)

## STEP 2: REDUCE BASELINE RISK

Avoid/Minimize:  
Nitrous Oxide  
Excessive fluid (But maintain adequate  
hydration)  
General (If regional is possible)  
Volatile Anesthetics

### LOW-INTERMEDIATE RISK

(0-2 risk factors)

2 Prophylactic Agents or 1 Prophylactic agent  
and TIVA

### HIGH RISK

(3-4 Risk Factors)

2 Prophylactic and TIVA

## STEP 3: INTERVENTIONS

(See List available at BUMC-T)

Corticosteroids  
Sympathomimetic Amine  
Antihistamine  
TIVA  
5-HT<sub>3</sub> receptor antagonists

Anticholinergic  
Butyrophenone  
Multimodal Analgesia  
(including block for post-op analgesia)

#### STEP 4: POSTOPERATIVE RESCUE

Do not repeat drugs given in the OR, but chose drug that has NOT been given

Re-administer drugs only if > 6 hours after PACU

Do not re-administer steroid or scopolamine

Use Droperidol in children only if other therapy has failed & the patient is being admitted to hospital

#### INTERVENTIONS AVAILABLE AT BUMC-T

##### Corticosteroids

Dexamethasone 4 mg IV at induction \$0.71

Dexamethasone 0.25 mg/kg IV, maximum 4 mg

Methylprednisolone 40 mg IV \$3.77

##### Phenothiazines

Promethazine 8.25 – 12.5 mg IV \$0.95

Perphenazine 5 mg IV (not available from wholesaler)

##### 5-HT<sub>3</sub> receptor antagonists

Ondansetron 4 mg IV End of surgery \$0.95

Ondansetron 0.1 mg/kg IV, maximum 4 mg

(For Children, it is reasonable to repeat this dose in PACU as a repeat dose 0.1 mg/kg IV, maximum

4 mg, total perioperative maximum 8 mg)

##### Anticholinergic agents

Scopolamine 1.5 mg patch Prior evening or 2 hr before surgery \$17.82

##### Butyrophenones

Haloperidol 0.5 - 1 mg IM/IV \$0.68

##### Sympathomimetic amine

Ephedrine 0.5 mg/kg up to 50mg IM \$43.98

##### Antihistamine

Diphenhydramine 0.5 mg/kg IV, maximum 25 mg for children as a rescue agent

\* Adapted from American Society for Enhanced Recovery 2016 guidelines

#### EXAMPLES

Low/intermediate risk patient: dexamethasone & ondansetron

High risk patient: add TIVA and multimodal analgesia; consider Aprepitant, scopolamine patch

Rescue in PACU: consider Droperidol, promethazine, ephedrine

## Preoperative Risk Assessment of Geriatric Patients

The American College of Surgeons (ACS) National Surgical Quality Improvement Program (NSQIP) and the American Geriatrics Society (AGS) published the ACS NSQIP/AGS Best Practice Guidelines: Optimal Preoperative Assessment of the Geriatric Surgical Patient. The PAC, in collaboration with Geriatrics, Medicine, Surgery, Nursing Service, and Administration developed and has, since 2014, been using our adaptation of those guidelines. We assess all patients  $\geq 65$  years of age scheduled for procedures.

The NSQIP protocol includes 15 steps, five of which are more appropriate for the surgical clinical, so we perform 10 risk assessments. In addition to conducting a complete and thorough history and physical examination, and the AHA/ACC risk assessment, we perform the following geriatric risk assessments:

### Cognitive Assessment

Why you should care: Preexisting **cognitive impairment** strongly predicts postoperative delirium, which is associated with worse surgical outcomes, including longer hospital stays, increased risk of perioperative mortality, and postoperative functional decline.

Procedure: The Mini-Cog test will be administered.

Cognitive assessment (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.)

#### COGNITIVE ASSESSMENT: MINI-COG

Mini-Cog: 3 Item Recall and Clock Draw

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

"I am going to say three words that I want you to remember now and later.

The words are:           Banana           Sunrise           Chair

Please say them for me now."

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:

"Please draw a clock in the space below. Start by drawing a large circle. Put all the numbers in the circle and set the hands to show 11:10 (10 past 11)."

If subject has not finished clock drawing in 3 minutes, discontinue and ask for recall items.

##### 3. SAY: "What were the three words I asked you to remember?"

## Interpretation of the Mini-Cog

SCORING:

3 item recall (0-3 points): 1 point for each correct word

Clock draw (0 or 2 points): 0 points for abnormal clock

2 points for normal clock

A NORMAL CLOCK HAS ALL OF THE FOLLOWING ELEMENTS:

All numbers 1–12, each only once, are present in the correct order and direction (clockwise) inside the circle.

Two hands are present, one pointing to 11 and one pointing to 2.

ANY CLOCK MISSING ANY OF THESE ELEMENTS IS SCORED ABNORMAL.

REFUSAL TO DRAW A CLOCK IS SCORED ABNORMAL.

Total Score of 0, 1, or 2 suggests possible impairment.

Total Score of 3, 4, or 5 suggests no impairment.

If the patient has evidence of cognitive impairment on the Mini-Cog, consider a referral to a primary care physician, geriatrician, or mental health specialist.

Interpretation: Score on Mini-Cog test:

0 1 2 // 3 4 5

0, 1, or 2 suggests possible cognitive impairment. A score of 3 or more suggests no cognitive impairment.

Action: Preexisting cognitive impairment strongly predicts postoperative delirium. Benzodiazepines and antihistamines should be avoided if possible; pain should be adequately controlled, but meperidine should be avoided.

### Screen for Depression

Why you should care: Preoperative **depression** has been associated with increased mortality after coronary artery bypass graft (CABG) and longer postoperative length of stay after CABG and valve operations. Depression has also been associated with higher pain perception and increased postoperative analgesic use.

Procedure: Patients not previously diagnosed or being treated for depression will be screened using two questions.

#### \_\_Screen the patient for depression

Ask the following two questions:

1. In the past 12 months, have you ever had a time when you felt sad, blue, depressed, or down for most of the time for at least two weeks?
2. In the past 12 months, have you ever had a time, lasting at least two weeks, when you didn't care about the things that you usually care about or when you didn't enjoy the things that you usually enjoy?

Interpretation: A yes to one or both questions suggests the patient may be depressed. The results will be reported as either **pos** or neg.

Action: Possible referral to primary care or mental health professional; careful attention to treatment of pain.

## Postoperative Delirium

Why you should care: **Postoperative delirium** is associated with higher mortality and complications, rates of institutionalization, greater costs and use of hospital resources, longer lengths of stay, and poorer functional recovery.

Procedure: The NSQIP guidelines give a list of many risk factors, but no method for ranking the individual patient's risk. The actual risk assessment we use will follow the Multivariable Predictors of Postoperative Delirium scoring system of Marcantonio and colleagues.

### Identify risk factors for developing postoperative delirium

#### RISK FACTORS FOR POSTOPERATIVE DELIRIUM

##### Risk Factors

- Cognitive impairment and dementia\*\* 1 pt
- Alcohol abuse 1 pt
- Electrolyte abnormalities (Markedly abn Na, K, BS) 1 pt  
(Na <130 >150; K <3>6; BS <60>300)
- Poor functional status 1 pt
- Older age ≤ 70 years 1 pt
- AAA 2 pts
- Thoracic surgery 1 pt

Interpretation: A score of 0 will be reported as low risk for developing postoperative delirium. A score of 1 or 2 will be reported as intermediate risk and a score of 3 or more indicates high risk.

Action: Benzodiazepines, anticholinergics, and antihistamines (for example, diphenhydramine) should be avoided if possible; pain should be adequately controlled, but meperidine should be avoided if possible; avoid urinary catheters, if possible.

### Screen for alcohol/substance abuse/dependence

Why you should care: Preoperative alcohol abuse and dependence are associated with increased rates of postoperative mortality and complications, including pneumonia, sepsis, wound infection and disruption, and prolonged length of stay.

Procedure: Any patient admitting to three or more drinks daily will be administered the modified C.A.G.E. test.

Ask the patient the following four questions:

1. Have you ever felt you should **C**ut down on your drinking or drug use?
2. Have people **A**nnoyed you by criticizing your drinking or drug use?

3. Have you ever felt bad or **G**uilty about your drinking or drug use?
4. Have you ever had a drink or drug first thing in the morning (**E**ye-opener) to steady your nerves or to get rid of a hangover?

Interpretation: A yes to any question suggests dependence. Results will be reported as **pos** or neg.

Action: If positive, consider perioperative prophylaxis for withdrawal syndromes. If operation can be delayed, consider referring motivated patients to substance abuse specialist for preoperative abstinence or medical detoxification. Patients with alcohol use disorder should receive perioperative daily multivitamins (with folic acid) and highdose oral or parenteral thiamine (100mg).

### **Pulmonary Risk**

Why you should care: In a study of patients undergoing elective abdominal procedures, pulmonary complications occurred more often than cardiac adverse events, and were associated with longer hospital stays. For patients undergoing general and vascular operations at a single NSQIP hospital, PPCs incurred the highest total hospital cost compared with infectious, thromboembolic, and cardiac adverse events; and required the longest median length of stay. Pulmonary complications also predicted long-term mortality in elderly patients ( $\geq 70$  years) undergoing noncardiac surgery.

Procedure: The NSQIP guidelines list 20 risk factors, but there is no method for rating the risks. Therefore we identify pulmonary risk factors. and use The Score for Prediction Qf postoperative Respiratory Complications (SPORC) to stratify the risk for re-intubation as a surrogate for severe pulmonary complications.

### **\_\_Identify risk factors for postoperative pulmonary complications**

ASA PS  $\leq 3$  = 3 pts  
Emergency = 3 pts  
High-risk service (CT, Vasc, Abd, NS, Transplant) = 2 pts  
Hx of CHF = 2 pts  
Chronic Pulm Disease = 1 pts

Interpretation:  
0-3 = low risk  
4-6 = intermediate risk  
7-11 high risk

Action: Minimize postoperative sedation, residual muscle weakness, respiratory depression, and avoid premature tracheal extubation.

### **Functional Status and Fall Risk**

Why you should care: Functional dependence is the strongest predictor of postoperative mortality in geriatric patients. Impaired mobility in elderly patients has also been linked to increased risk of postoperative delirium and surgical site infections with MRSA. Prolonged Timed Up and Go Test ( $\geq 15$  seconds) and any functional dependence are strong predictors for requiring postoperative discharge institutionalization. In addition, good 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.

Procedure: We will assess the patient's ability to perform daily activities. A more in-depth evaluation may be necessary. Deficits in vision, hearing, or swallowing will be documented.

### Document functional status and history of falls

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

Ask the patient the following four questions:

1. Can you get out of bed or chair yourself?    Yes    No
2. Can you dress and bathe yourself?    Yes    No
3. Can you make your own meals?    Yes    No
4. Can you do your own shopping?    Yes    No

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

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

2. Document deficits in vision, hearing, or swallowing.
3. Inquire about history of falls ("Have you fallen in the past year?").
4. Evaluate the patient for limitations in gait and mobility and determine risk for falls.

#### Timed Up and Go Test (TUGT)

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 line on the floor (10 feet)
3. Turn
4. Return to the chair
5. Sit down again

#### Interpretation:

Functional status: Independent    Partially dependent    **Dependent**  
High risk for falls: **yes**

Action: For dependent patients, avoid or minimize the use of IV sedatives, depressants, and narcotics. For patients at high risk for falls, institute fall precautions.

## Frailty

Why you should care: Frailty is a syndrome of decreased physiologic reserve and resistance to stressors, which leaves patients more vulnerable to poor outcomes, including falls, worsening mobility and ADL disability, hospitalizations, and death. It is clinically distinct from comorbidity and disability. Frailty has been shown to independently predict higher rates of postoperative adverse events, increased length of stay, and higher likelihood of discharge to a skilled or assisted-living facility in elderly surgical patients.

Procedure: We will assess unintentional weight loss; grip strength, exhaustion, low physical activity and slowness.

### Determine baseline frailty score

- A. Unintentional weight loss  $\geq$  10 lbs or 5% of body weight: Yes  
 B. Decreased grip strength (weakness) Yes

<b>Men</b>		<b>Women</b>	
BMI	Kg Force	BMI	Kg Force
$\leq 24$	$\leq 29$	$\leq 23$	$\leq 17$
24.1-26	$\leq 30$	23.1-26	$\leq 17.3$
26.1-28	$\leq 30$	26.1-29	$\leq 18$
$> 28$	$\leq 32$	$> 29$	$\leq 21$

- C. Exhaustion ; Yes

For the following two statements:

"I felt that everything I did was an effort."

"I could not get going."

The patient is asked: "How often in the last week did you feel this way?"

0 = rarely or none of the time (<1 day)

1 = some of a little of the time (1-2 days)

2 = a moderate amount of the time (3-4 days)

3 = most of the time

The criterion is met if patient answers 2 or 3 to either statement.

- D. Low physical activity: Yes

Ask the patient: How often do you do vigorous activities (walking, sports, gardening, heavy house work, walk a flight of stairs, e.g.) for 20 minutes?

none = 0            a little (1-2X/wk) = 1            a lot (>2X/wk) = 2

The criterion is met if the patient answers 0 or 1.

- E. Slowed Walking Speed: Yes

Walking speed in the lowest 20th percentile by gender and height. Time is measured for a distance of 15 feet at normal pace. The average of three trials is used.

Men	
Height	Time
≤173 cm	≥7 sec
>173 cm	≥6 sec

Women	
Height	Time
≤159 cm	≥7 sec
>159 cm	≥6 sec

Interpretation: The patient will receive 1 point for each criterion met.

0-1 = Not Frail      2-3 = Pre-frail      4-5 = Frail

Action: Patients who score 2 or more should be treated similarly to those with poor functional status and high fall risk.

### Nutritional Status

Why you should care: Poor nutritional status is associated with increased risk of postoperative infectious complications, wound complications, and increased length of stays.

Procedure: We will assess BMI, serum albumin, and unintentional weight loss.

If: the BMI is <18.5 kg/m<sup>2</sup> or serum albumen is <3.0 g/dl or unintentional weight loss > 10% in 6 months, the patient is at severe nutritional risk

Interpretation: A positive finding in any of the criteria indicates severe nutritional risk and will be reported as **yes**.

Action: Consider delaying the case to improve the patient's status; if that is not feasible, consider perioperative nutritional support.

### Laboratory Tests

Appropriate tests will be evaluated including electrolytes, hemoglobin, BUN, creatinine, calculated (Cockcroft-Gault) creatinine clearance, and albumin, along with any clinically indicated studies.

The PAC staff will complete the testing during their assessment of patients in the PAC and provide you with the scoring sheet below.

Preoperative Assessment of Geriatric Patients  
(age 65 and older)

In addition to conducting a complete and thorough history and physical examination of the patient, the following assessments are strongly recommended:

\_\_Assess the patient's cognitive ability

Score on Mini-Cog test:

0 1 2 // 3 4 5

\_\_Screen the patient for depression.

Pos // neg

\_\_Identify the patient's risk factors for developing postoperative delirium.

Low intermediate high

\_\_Screen for alcohol and other substance abuse/dependence. (CAGE)

pos // neg

\_\_Assess risk factors for postoperative pulmonary complications.

low intermediate high

\_\_Document functional status

independent partially dependent dependent

and risk for falls. low high

\_\_Determine baseline frailty score.

not frail pre-frail frail

\_\_Assess patient's nutritional status and consider preoperative interventions if the patient is at severe nutritional risk. yes

(N.B., this page will be completed for each patient assessed for use by the anesthesiologist completing the EMR and the positive results incorporated in the Preoperative anesthesia assessment.

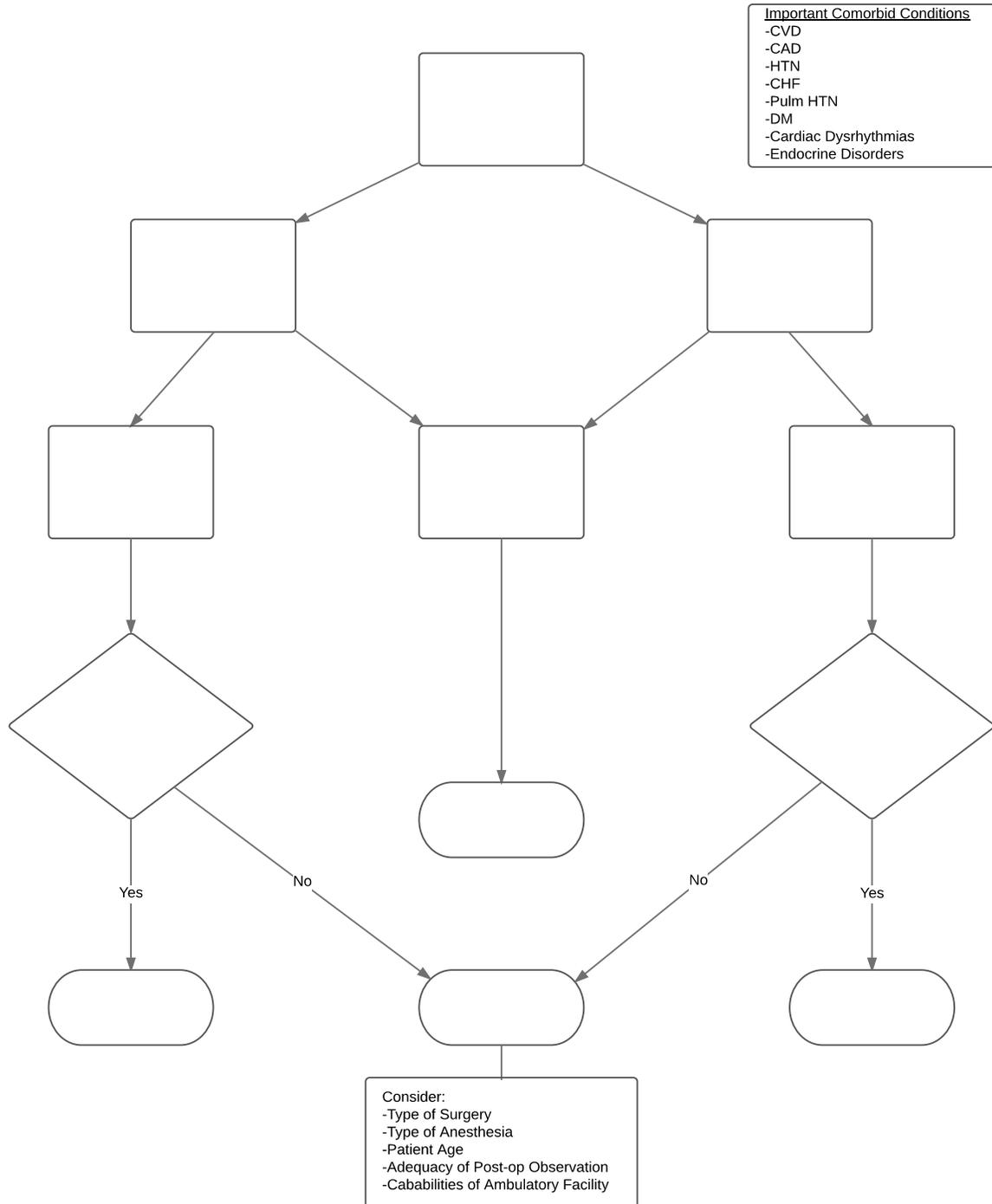
# Obstructive Sleep Apnea Protocol

Developed by J.C.Liljenquist, M.D.

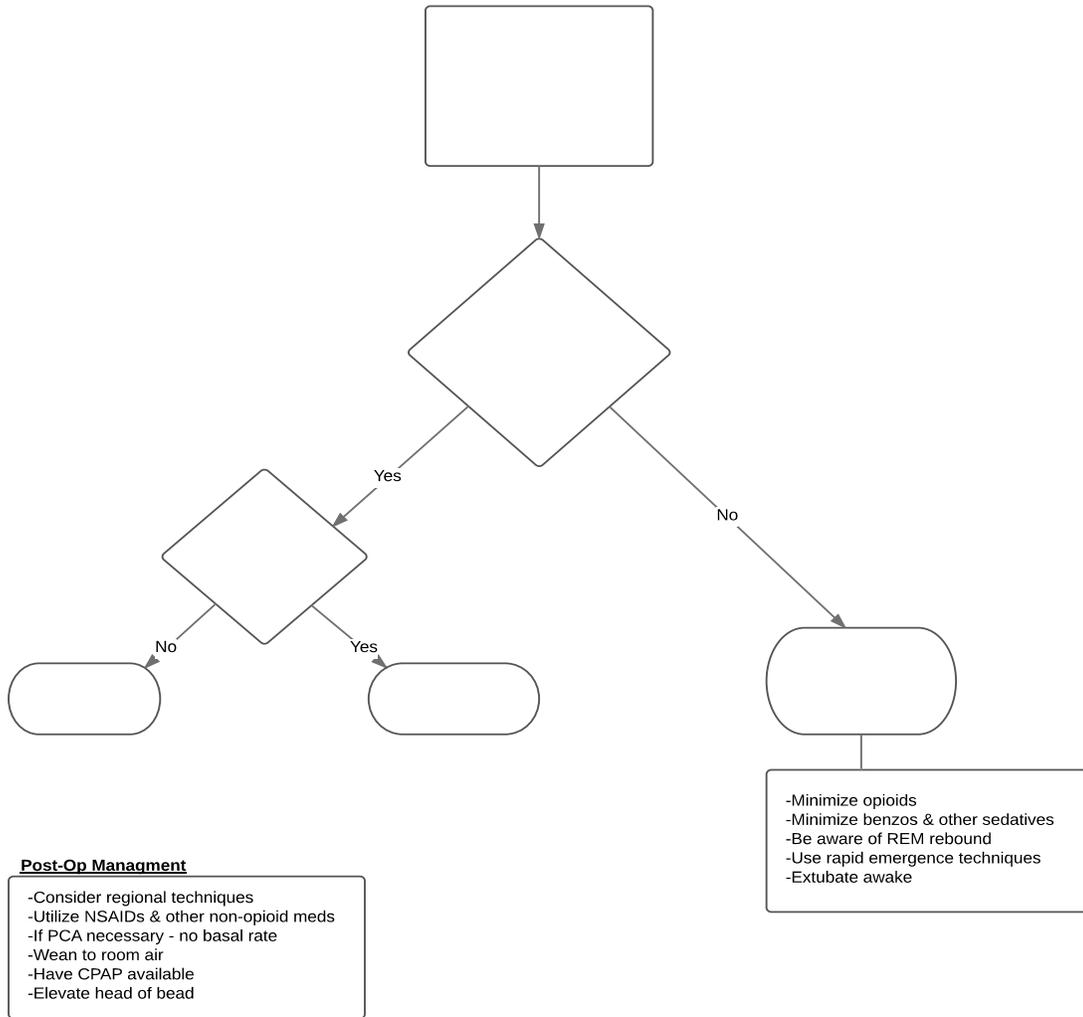
Championed by Lance Patel, M.D.

These protocols are intended for any patient diagnosed, being treated for, or at high risk for OSA:

## OSA Pre-op Evaluation: Ambulatory vs. In-patient/Observation



## OSA Intra-op & Post-op Management



One of the most common question that comes up is how to deal with the child with a current or recent cough and runny nose. The following protocol was developed with the help of Dr. R.A.Tait from Michigan and approved by our faculty:

