



Number 123

January 2008

## New CV Evaluation & Treatment Guidelines for Non-Cardiac Surgery

Cardiac complications pose one of the most significant risks to patients undergoing major noncardiac surgery. It is anticipated that the number of noncardiac surgical procedures performed in older persons, who have higher CV risk, will increase from the current 6 million to nearly 12 million per year, and nearly one fourth of these—major intra-abdominal, thoracic, vascular, and orthopedic procedures—have been associated with significant perioperative CV morbidity and mortality. Successful perioperative evaluation and management of patients undergoing non-cardiac surgery is important now and will be even more so in the future. An update of the 2002 Guideline was just released by the ACC/AHA to provide a framework to assist in the clinical decision-making process.<sup>1</sup> This *Heartbeat* will present an overview and list the key points.

Integration of the history, physical evaluation and ECG by the clinician should provide a good estimation of perioperative CV risk. Indications for further cardiac testing and treatments are the same as in the non-operative setting, but their timing is dependent on several factors, including the urgency of noncardiac surgery, patient-specific risk factors, and surgery-specific considerations. The use of both noninvasive and invasive preoperative testing has been de-emphasized (new *Stepwise algorithm* on the last page). These studies should be limited to those circumstances in which the results of the tests *clearly* affect patient management.

For many patients, the first opportunity to receive an appropriate assessment of both short- and long-term cardiac risk comes with this pre-operative evaluation. The consultant will serve the patient best by making recommendations aimed at lowering the immediate perioperative cardiac risk and to decrease long term coronary risk with appropriate follow-up and intervention. In many instances optimal medical treatment (OMT)—to control blood pressure, diabetes and cholesterol and/or decrease long term CV and renal risk—also decreases the immediate perioperative risk. *The goal of the consultation is the optimal care of the patient.*

The overriding theme of the new guidelines is that diagnostic studies (especially stress testing) are rarely necessary to lower the risk of surgery unless it will influence treatment irrespective of the preoperative context. In other words, most patients who are *asymptomatic* and on OMT for all identified medical problems are probably stable for an anticipated surgery. Several trials now show that in people without symptomatic heart disease, fixing the heart first doesn't make much difference in how well they do in surgery.

### Key Points:

**Functional capacity** — Assessment of cardiac functional status should be performed. The assessment of functional ability provides valuable prognostic information, since good functional status is associated with a lower risk of complications. Functional status can be expressed in metabolic equivalents (1 MET is

defined as 3.5 ml O<sub>2</sub> uptake/kg per min, which is the resting oxygen uptake in a sitting position). Perioperative cardiac and long-term risk is increased in patients unable to meet a 4-MET demand during most normal daily activities.

Various activity scales provide the clinician with a set of questions to determine a patient's functional capacity. Indicators of functional status include the following:

- Can take care of self, such as eat, dress or use the toilet (1 MET)
- Can walk up a flight of steps or a hill (4 METs)
- Can do heavy work around the house such as scrubbing floors or lifting or moving heavy furniture (between 4 and 10 METs)
- Can participate in strenuous sports such as swimming, singles tennis, football, basketball, and skiing (>10 METs)

One important indicator of poor functional status and an increased risk of postoperative cardiopulmonary complications after major noncardiac surgery is the inability to climb two flights of stairs or walk four blocks.

**Major CV Risk Factors** — Presence of any of these conditions mandates intensive management and may result in delay or cancellation of surgery unless the surgery is emergent:

- Unstable coronary syndromes (ACS)
  - Unstable or severe angina, recent MI
- Decompensated HF (worsening or new onset)
- Significant arrhythmias
  - High-grade AV block
  - Mobitz II AV block
  - Third-degree AV block
  - Symptomatic ventricular arrhythmias
  - Supraventricular arrhythmias

(Including atrial fibrillation) with UVR (> 100 bpm @ rest)

- Symptomatic bradycardia
- Newly recognized VT
- Severe valvular disease
  - Severe AS (mean PG > 40mmHg, AV area < 1.0cm<sup>2</sup> or symptomatic)
  - Symptomatic MS (progressive dyspnea with exertion, exertional syncope, or HF)

**Other Clinical Risk Factors** — Presence of any of these conditions is a marker for higher risk and therefore mandates more careful screening for symptoms indicating instability and/or making sure they're receiving OMT:

- History of ischemic heart disease
- History of compensated or prior HF
- History of cerebrovascular disease
- Diabetes mellitus
- Renal insufficiency

For high-risk cardiac patients undergoing noncardiac surgery, successful perioperative evaluation and management require multidisciplinary management and communication among the surgeon, anesthesiologist, primary caregiver, and cardiovascular consultant.

**Pre-op Interventions** — New emphasis is placed on the fact that coronary artery bypass grafting (CABG) or percutaneous coronary intervention (PCI) is of no value in preventing perioperative cardiac events except in patients with independent indications for revascularization for ACS. **Dr Lee Fleisher** (Hospital of the University of Pennsylvania) chair of the guideline writing committee, explains, "Previously, to have someone ready for surgery, we would do a lot of screening, and we might fix their heart disease to get them ready for

the noncardiac surgery. Several trials now show that in people without symptomatic heart disease, fixing the heart first doesn't make much of a difference in how well they do in surgery."

**Delaying Surgery** — Special emphasis is placed on delaying surgery for those with recent interventions:

- 2 to 4 weeks for recipients of PCI without stents
- 4 to 6 weeks for recipients of PCI with bare-metal stents (BMS)
- At least 12 months for recipients of PCI with drug-eluting stents (DES)

Most experts would recommend that patients who require cardiac intervention before urgent elective noncardiac surgery should have PCI with use of a bare-metal stent followed by 4 to 6 weeks of clopidogrel (Plavix) plus aspirin. If surgery is necessary before 4 weeks consider CABG or PCI without stenting.

In all cases, aspirin should be continued unless there is a significant risk for bleeding. In recipients of DES who must undergo urgent surgery that mandates the discontinuation of clopidogrel, it is reasonable to continue aspirin if at all possible and to restart clopidogrel as soon as possible. Aspirin shouldn't be an issue since all CABG surgery is now done with aspirin.

**Perioperative Statin Therapy** — The authors recommend that statins should be continued in patients currently taking them. Clinical trial evidence accumulated so far suggests a protective effect of preoperative statin use on cardiac complications during noncardiac surgery, so statins should not be discontinued before surgery. (Statins should be added preoperatively, where clinically appropriate.) Optimal dose and goal LDL-C levels are still unclear in this setting—just use your usual treatment goals based on risk stratification.

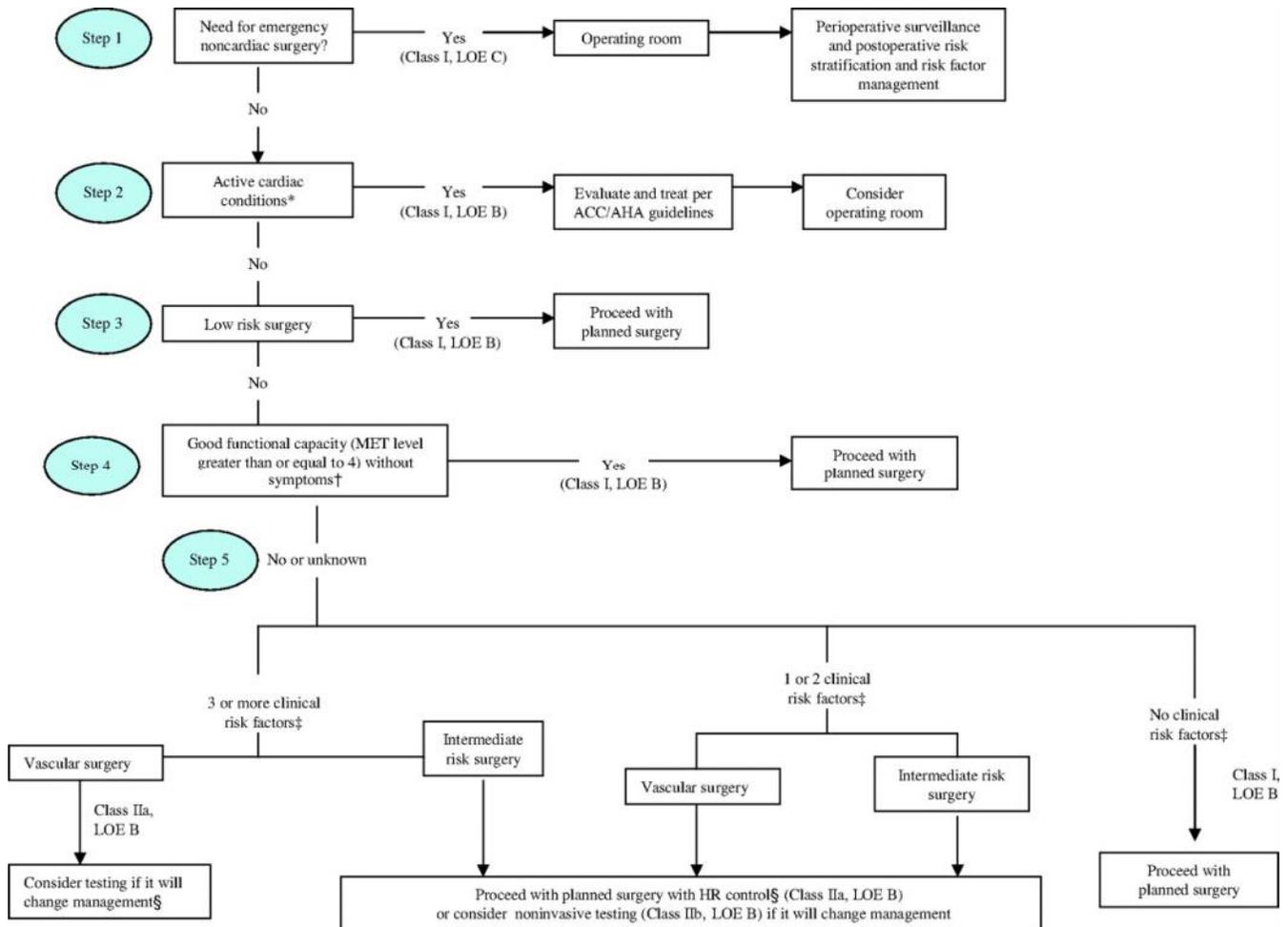
## Perioperative $\beta$ -Blocker Therapy —

- **$\beta$  blockers (BB):** Should be continued in patients undergoing surgery who are receiving BBs where indicated to treat existing conditions or other ACC/AHA class I guideline indications;
- Should be given to patients undergoing vascular surgery who are at high cardiac risk owing to the finding of ischemia on preoperative testing;
- Are probably recommended for patients undergoing vascular surgery in which preoperative assessment identifies CHD;
- Are probably recommended for patients in whom preoperative assessment for vascular surgery identifies high cardiac risk, as defined by the presence of more than 1 risk factor.\*
- Are probably recommended for those in whom preoperative assessment identifies CHD or high cardiac risk, as defined by the presence of more than 1 risk factor,\* undergoing intermediate-risk or vascular surgery.

Studies *suggest* that BBs reduce perioperative ischemia and may reduce MI and death in patients with known CAD. Available evidence suggests but doesn't prove that when possible long-acting BBs should be started a week before surgery when possible (metoprolol succinate ER)—preferably not atenolol shown inferior to other BBs for HBP and to substantially increase peripheral vascular resistance.<sup>2</sup>

**POISE (PeriOperative ISchemic Evaluation)** trial, presented at the November AHA meeting (after release of the guidelines), evaluated  $\beta$  blocker therapy among patients with/or at risk of atherosclerotic disease undergoing noncardiac surgery. Results showed higher total mortality (3.1% vs. 2.3% placebo). Metoprolol reduced nonfatal MI compared to placebo (3.6% vs. 5.1%). Most believe, based on this new unexpected information, we should continue preexisting treatment but not initiate it. This has divided the experts and may necessitate a change in the guidelines. Further study is needed.

## Stepwise Approach to Peri-operative Cardiac Assessment:



The Figure above presents, in algorithmic form, a framework for determining which patients are candidates for cardiac testing. The clinician has to consider several interacting variables and weight each appropriately. Since publication of the perioperative cardiovascular evaluation guidelines in 2002, several new randomized trials and cohort studies have led to modification of the original algorithm. Given the availability of this evidence, the writing committee chose to include the level of the recommendations and strength of evidence for each of the pathways.

Mario L Maiese DO, FACC, FACOI  
 Clinical Associate Professor of Medicine, UMDNJ-SOM  
 Email: [maiese1@comcast.net](mailto:maiese1@comcast.net)

Heartbeats online: [www.sjhg.org](http://www.sjhg.org)

**Heartbeat is a South Jersey Heart Group publication.**

<sup>1</sup> Fleisher LA et al. ACC/AHA 2007 guidelines on perioperative cardiovascular evaluation and care for noncardiac surgery: A report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Writing Committee to Revise the 2002 Guidelines on Perioperative Cardiovascular Evaluation for Noncardiac Surgery) developed in collaboration with the American Society of Echocardiography, American Society of Nuclear Cardiology, Heart Rhythm Society, Society of Cardiovascular Anesthesiologists, Society for Cardiovascular Angiography and Interventions, Society for Vascular Medicine and Biology, and Society for Vascular Surgery. *J Am Coll Cardiol* 2007 Oct 23; 50: 1707-32.

<sup>2</sup> Lindholm L H et al. Should blockers remain first choice in the treatment of primary hypertension? A meta-analysis *Lancet* October 25 2005; 366: 1545-53.