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**PERIOPERATIVE BETA BLOCKERS****Key points:**

1. Perioperative beta blockers are recommended for patients already receiving them for cardiovascular indications. Exact dosing regimen is uncertain.
2. There is evidence that a high dose perioperative beta blocker regimen decreases nonfatal MI, but increases stroke, hypotension, bradycardia, and mortality.

There has been an evolution in the literature regarding the use of perioperative beta blockers. The rationale for perioperative blockade postulates that the decrease in cardiac demand reduces the risk of ischemia in the setting of perioperative stress.

A study in 1996 of 200 patients with known CAD or multiple CAD risk factors found that those randomized to atenolol immediately before surgery had reduced mortality at 2 years—however there were concerns at the randomization, lack of intention-to-treat analysis, and lack of early clinical outcome difference.<sup>1</sup>

An unblinded 1999 study randomized patients with a positive dobutamine stress echo undergoing vascular surgery to bisoprolol versus usual care, and found a decrease in death or nonfatal MI at 30 days. Notably, this was a high risk group of patients with a placebo rate of death or nonfatal MI of 34%.<sup>2</sup>

These two studies, among others, led to the increased use of perioperative beta blockers in both high risk patients undergoing vascular surgery, as well as patients with cardiac risk factors undergoing noncardiac surgery.

In 2005 a retrospective cohort study examined over 600,000 patients and found that beta blockers may cause harm in patients who were of low cardiac risk based on risk factors from the Revised Cardiac Risk Index.<sup>3</sup> A meta-analysis that same year was inconclusive as to whether there was any benefit to perioperative beta blockers, but did find an increased rate of bradycardia and hypotension.<sup>4</sup>

AHA guidelines as of June 2006 recommended as class I indications to continue beta blockers in those patients already receiving them for angina, arrhythmia, or hypertension, and for vascular surgery patients with a positive preoperative stress test.<sup>5</sup> Other indications were class IIa.

In May 2008 the POISE trial results were published.<sup>6</sup> Over 8000 patients not previously on a beta blocker with CAD, PVD, stroke, CHF within 3 yrs, major vascular surgery, or 3 of 7 RFs ( intrathoracic/intraperitoneal surgery, TIA, CHF, DM, Cr >2, age >70, emergent/urgent surgery) undergoing noncardiac surgery were randomized to a regimen of high dose oral and/or IV metoprolol immediately before and after surgery. There was a decrease in the composite end point of cardiovascular death, nonfatal MI, or nonfatal cardiac arrest (5.8% versus 6.9%) at 30 days, driven mainly by the decrease in nonfatal MI. However, there was increased hypotension, bradycardia, stroke, and total mortality.

In November 2008 a systematic review concluded that there was insufficient evidence to support the use of perioperative beta blockers in patients who were not already on them for cardiovascular indications.<sup>7</sup> This review's results were dominated by the POISE trial, as it was by far the largest in number of participants.

There has been discussion as to whether the POISE trial used a dose and dose-titration regimen of beta blocker that was too high. Consider however that a lower dose regimen with negative results may have been interpreting as simply not achieving adequate beta blockade.

## *Cardiology*

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It is our position that in light of the current data, we do not recommend providing beta blockers purely in an attempt to reduce perioperative cardiac complications in patients who are not already receiving them for cardiovascular indications. There is insufficient evidence of benefit, and ample evidence of harm. This is in line with AHA class I guidelines.

Patients with the other class I indication, vascular surgery patients with a positive preop stress test, could be given beta blockers well in advance of surgery in the outpatient setting if indicated apart from the need to have surgery. If tolerated, they would then fall under the first class I indication.

### **AHA guidelines (June 2006):**

#### Class I:

- (A) Continue in those already receiving them for angina, arrhythmia, HTN.
- (B) Vascular surgery with positive preop stress test.

#### Class IIa:

- (A) Vascular surgery in patients with coronary heart disease.
- (B) Vascular surgery with multiple risk factors.
- (C) CHD or multiple RFs, undergoing intermediate to high risk procedures.

### **References:**

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