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## Hospitalist Update

### The Use of Perioperative Beta Blockers in Non-cardiac Surgery Patients

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Currently, more than 30 million noncardiac surgeries are performed in the United States each year. Perioperative cardiac complications are a major cause of morbidity and death in these patients, prolonging hospitalizations and significantly increasing health care costs. The potential role of beta blockers in reducing the incidence of perioperative cardiac complications has been a subject of debate and controversy for some time.

In the 1970s, it was recommended that we avoid the use of beta blockers during the perioperative period since they might induce bradycardia and hypotension. However, subsequent studies showed that there was a dose-related reduction in the incidence of MI with beta blocker therapy and, in the 2002 American Heart Association/American College of Cardiology guidelines, it was recommended that perioperative beta blockers be used unless specific contraindications were documented. These guidelines were updated and endorsed in 2007, with Class 1B and Class IIB indications for those patients with CAD, CAD equivalent, inducible ischemia and noncardiac vascular surgery.

Then, a Canadian research team organized a large, international, randomized trial called POISE (Perioperative Ischemic Evaluation Study); results of the trial were published in 2008. Researchers enrolled more than 8000 patients who were scheduled for noncardiac surgery and had risk factors for perioperative cardiac complications. The patients received either extended-release metoprolol (100 mg) or placebo, starting 2-4 hours before surgery and continuing for 1 month postoperatively. Although the 30-day incidence of nonfatal myocardial infarction was significantly lower in the group receiving metoprolol than in those receiving placebo (3.6% vs. 5.1%), the metoprolol group experienced significantly higher all-cause mortality (3.1% vs. 2.3%) and a significantly higher incidence of stroke (1.0% vs. 0.5%). These adverse outcomes may be explained, in part, by higher rates of hypotension and bradycardia in those receiving metoprolol. The research team could not identify any subgroup that clearly (cont)



(cont) benefitted from the use of metoprolol and, in summary, the reduction in perioperative myocardial infarction and primary cardiac events was achieved against a backdrop of higher rates of stroke and overall mortality.

The American College of Cardiology and the American Heart Association has thus released a Focused Update to the Practice Guidelines, based on the new clinical trial data; this Update summarizes and sheds light on the risks and benefits of using beta blockers to reduce perioperative cardiac events in patients undergoing noncardiac surgery and provides specific recommendations regarding which patients will likely benefit and in which patients there is insufficient evidence to support use of perioperative beta blockers. These new guidelines are published in the **November 24, 2009, issue of *Circulation***.

A brief summary of the new guidelines:

The perioperative use of beta blockers is intended to protect against myocardial infarction by lowering the heart rate and blocking the negative effects of stress hormones. For patients already taking beta blockers at the time of surgery, these medications should be continued (as per the 2007 guidelines). The work group advises that it is reasonable to consider the addition of perioperative beta blockers in:

1. Patients at high risk for myocardial infarction or other cardiac complications in light of abnormal stress test results or known CAD who undergo vascular surgery
2. High risk patients undergoing intermediate risk surgery or in those with multiple risk factors (e.g. diabetes mellitus, history of CHF, significant renal disease) who undergo vascular surgery

When patients who are not already on beta blockers are started on perioperative beta blockade, the medication should be initiated well before the procedure and the dose should be titrated as blood pressure and heart rate allow. The new guidelines do not support the routine use of perioperative beta blockers, especially in higher, fixed-dose regimens, and reinforce the avoidance of beta blockade in patients with contraindications for their use.

