Recommendations for PCI are similar to those for patients with suspected or known CAD and should conform to the ACC/AHA guidelines. Recommendations by the AHA/ACC Society for Cardiovascular Angiography and Intervention, the American College of Surgeons, and the American Dental Association Science Advisory Committee are for a 30- to 45-day delay of surgery in patients taking thienopyridine dual antiplatelet therapy after bare-metal coronary stent placement and a 365-day wait after placement of a drug-eluting stent. Some studies indicate that the duration of dual antiplatelet therapy may be shortened to less than 1 year in selected patients receiving newer-generation stents (such as everolimus- or zotarolimus-eluting stents). Individualized decisions about the duration of dual antiplatelet therapy are important, given that recommended timeframes for the use of such therapy are based primarily on expert opinion. If a patient needs to undergo noncardiac surgery within 2 to 6 weeks, drug-eluting stents should not be implanted; balloon angioplasty appears to be a reasonable alternative. If the noncardiac surgery is urgent or emergent, CABG combined with the noncardiac surgery may be considered; however, cardiac risks, the risk for bleeding, and the long-term benefit of coronary revascularization must be weighed.

Currently, studies suggest that optimal medical therapy is the preferred strategy for intermediate- to high-risk patients with RCRI scores of 2 or higher who are without documented severe myocardial ischemia. As stated previously, the CARP trial demonstrated that preoperative coronary revascularization strategies to reduce perioperative cardiovascular risk did not offer significant benefit compared with excellent medical treatment in intermediate- to high-risk patients undergoing vascular surgery. However, high-risk patients with left main coronary stenosis, severe aortic stenosis, left ventricular ejection fraction of 20% or less, or unstable coronary symptoms were excluded from that trial. In many of these patients, coronary or valve surgery may be indicated on its own merit, without factoring in the noncardiac surgery. Therefore, coronary revascularization may be appropriate if diagnostic catheterization reveals left main disease or multivessel disease and depressed ejection fraction.

Using the information obtained from the composite algorithm (Fig. 24-2), a key decision is whether the risk for perioperative cardiac events is sufficiently low to proceed with surgery. For patients identified to be at high cardiac risk who are not candidates for coronary revascularization, the physician may decide to perform a less extensive major plastic reconstruction, consider laparoscopic versus open procedures or alternative palliative procedures, or attempt to modify cardiac risk by additional intraoperative and perioperative therapies.

β-Adrenergic Antagonists

There is uncertainty about the effectiveness and safety of perioperative β-blockade in patients undergoing noncardiac surgery. The ACC/AHA guidelines focusing on recommendations for perioperative β-blocker therapy limit class I recommendations to patients undergoing surgery who are already receiving β-blockers to treat angina, symptomatic arrhythmias, or hypertension. Class IIb recommendations are given for the initiation of β-blocker therapy prior to surgery in those with intermediate- or high-risk myocardial ischemia noted on preoperative noninvasive stress testing (level of evidence C) and patients with 3 or more RCRI risk factors (level of evidence B). European guidelines make explicit recommendations for the use of atenolol or bisoprolol when oral β-blockade is first introduced in patients undergoing noncardiac surgery.

The Perioperative Ischemic Evaluation (POISE) trial addressed the limitations of perioperative β-blockade. The POISE trial randomized 8351 intermediate- to high-risk patients older than 45 years of age to receive either a long-acting oral metoprolol succinate (metoprolol CR) or placebo. A high starting dose of metoprolol CR was administered: 100 mg was started orally 2 to 4 hours before surgery and continued for up to 6 hours after surgery and then daily for 30 days; alternatively, a slow intravenous infusion of 15 mg every 6 hours was administered until patients were able to receive the drug orally, after which oral administration was continued daily for 30 days. The medication was withheld if systolic blood pressure fell to less than 100 mm Hg or heart rate to less than 50 beats per minute. The results showed that the incidence of cardiac death, nonfatal MI, or cardiac arrest was reduced in the metoprolol group compared with placebo (5.8% versus 6.9%; hazard ratio = 0.84; 95% confidence interval [CI], 0.70 to 0.99; $P = .04$). However, there was an increased incidence of mortality and stroke in the metoprolol group compared with the placebo group (3.1% versus 2.3% [$P = .03$] and 1% versus 0.5% [$P = .005$], respectively,). Therefore, for every 1000 patients treated, metoprolol CR would prevent 11 MIs in intermediate- to high-risk patients undergoing major noncardiac surgery, but at a cost of 8 deaths and 5 disabling strokes. Stroke was associated with perioperative hypotension, bleeding, atrial fibrillation, and a history of stroke or transient ischemic attack. The POISE trialists highlighted the importance of a clear risk and benefit assessment for the initiation of preoperative β-blockers (see Fig. 24-2).

There remains a need for more precise, unambiguous practice recommendations for perioperative β-blockade. Preexisting β-blockade should be continued because withdrawal might increase perioperative mortality. If β-blockers are newly initiated in appropriately selected higher-risk patients undergoing noncardiac surgery, they should be carefully titrated and not abruptly initiated on a high-dose regimen to achieve the desired heart rate.

HMG-CoA Reductase Inhibitors (Statins)

Prospective and retrospective evidence supports the perioperative prophylactic use of 3-hydroxy-3-methylglutaryl–coenzyme A (HMG-CoA) reductase inhibitors (statins) for reduction of perioperative cardiac complications in patients with established atherosclerosis. Statins should be continued in patients who are already on statin therapy and undergoing noncardiac surgery. A class IIa indication is assigned to the use of statins for patients undergoing vascular surgery with or without clinical risk factors.

Calcium Channel Blockers

Evidence is lacking to support the use of calcium channel blockers as a prophylactic strategy to decrease perioperative risk in patients undergoing major noncardiac surgery.

Angiotensin-Converting Enzyme Inhibitors

Angiotensin-converting enzyme (ACE) inhibitors and angiotensin II–receptor antagonists are frequently prescribed for the