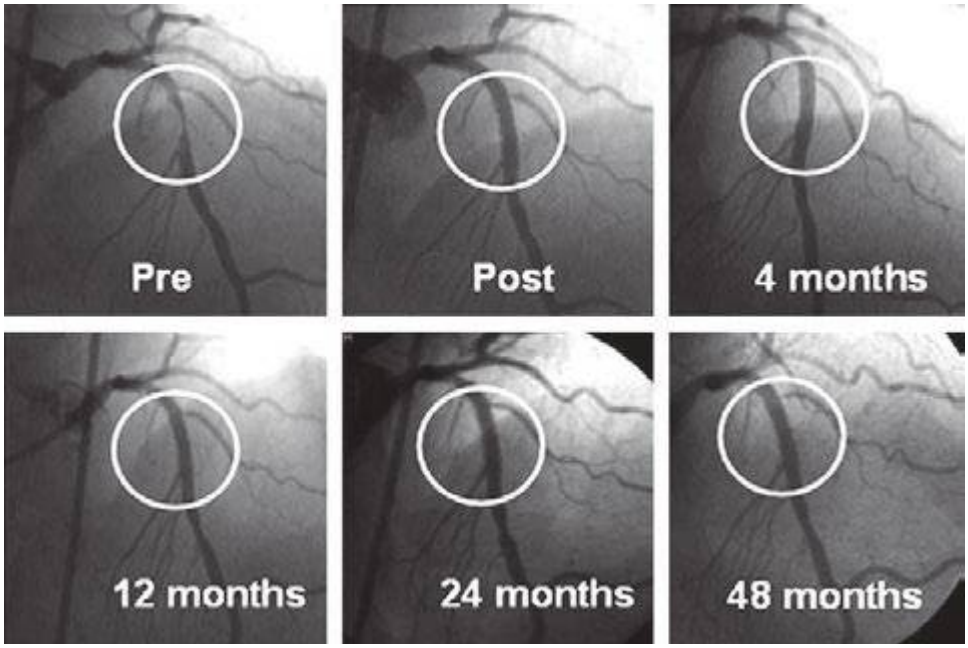

FIGURE 296e-3 Long-term results from one of the first patients to receive a sirolimus-eluting stent from early Sao Paulo experience. *(From: GW Stone, in D Baim [ed]: Cardiac Catheterization, Angiography and Intervention, 7th ed. Philadelphia, Lippincott Williams & Wilkins, 2006; with permission.)*

(Fig. 296e-3). Clinical restenosis is recognized by recurrence of angina or symptoms within 9 months of the procedure. Less frequently, patients with restenosis can present with non-ST-segment elevation myocardial infarction (NSTEMI) (10%) or STEMI (2%) as well. Clinical restenosis requires confirmation of a significant stenosis at the site of the prior PCI. *Target lesion revascularization* (TLR) or *target vessel revascularization* (TVR) is defined as angiographic restenosis with repeat PCI or coronary artery bypass grafting (CABG). By angiography, the incidence of restenosis is significantly higher than clinical restenosis (TLR or TVR) because many patients have mild restenosis that does not result in a recurrence of symptoms. The management of clinical restenosis is usually to repeat the PCI with balloon dilatation and placement of a drug-eluting stent. Once a patient has had restenosis, the risk of a second restenosis is further increased. The risk factors for restenosis are diabetes, myocardial infarction, long lesions, small-diameter vessels, and suboptimal initial PCI result.

INDICATIONS

The American College of Cardiology (ACC)/American Heart Association (AHA) guidelines extensively review the indications for PCI in patients with stable angina, unstable angina, NSTEMI, and STEMI and should be referred to for a comprehensive discussion of the indications. Briefly, the two principal indications for coronary revascularization in patients with *chronic stable angina* (Chap. 293) are (1) to improve anginal symptoms in patients who remain symptomatic despite adequate medical therapy and (2) to reduce mortality rates in patients with severe coronary disease. In patients with stable angina who are well controlled on medical therapy, studies such as the Clinical Outcomes Utilizing Revascularization and Aggressive Drug Evaluation (COURAGE) and Bypass Angioplasty Revascularization Investigation 2 Diabetes (BARI 2D) trials have shown that initial revascularization does not lead to better outcomes and can be safely delayed until symptoms worsen or evidence of severe ischemia on noninvasive testing occurs. When revascularization is indicated, the choice of PCI or CABG depends on a number of clinical and anatomic factors (Fig. 296e-4). The Synergy between Percutaneous Coronary Intervention with Taxus and Cardiac Surgery (SYNTAX) trial compared PCI with the paclitaxel drug-eluting stent to CABG in 1800 patients with three-vessel coronary disease or left main disease. The study found no difference in death or myocardial infarction at 1 year, but repeat revascularization was significantly higher in the stent-treated group (13.5 vs. 5.9%), while stroke was significantly higher in the surgical group (2.2 vs. 0.6%). The primary endpoint of death, myocardial infarction, stroke, or revascularization was significantly better with CABG, particularly in those with the most extensive coronary artery disease. The 3-year results confirm these findings. The Future Revascularization Evaluation in Patients With Diabetes Mellitus: Optimal Management of Multivessel Disease (FREEDOM) trial randomized 1900 patients with diabetes and multivessel disease and showed a significantly lower primary endpoint of death, myocardial infarction, or stroke with CABG than PCI. These studies support CABG for those with the most severe left main and three-vessel disease or those with diabetes. Lesser degrees of multivessel disease in patients with or without diabetes have an equal outcome with PCI.

The choice of PCI versus CABG is also related to the anticipated procedural success and complications of PCI and the risks of CABG. For PCI, the characteristics of the coronary anatomy are critically important. The location of the lesion in the vessel (proximal or distal), the degree of tortuosity, and the size of the vessel are considered. In addition, the

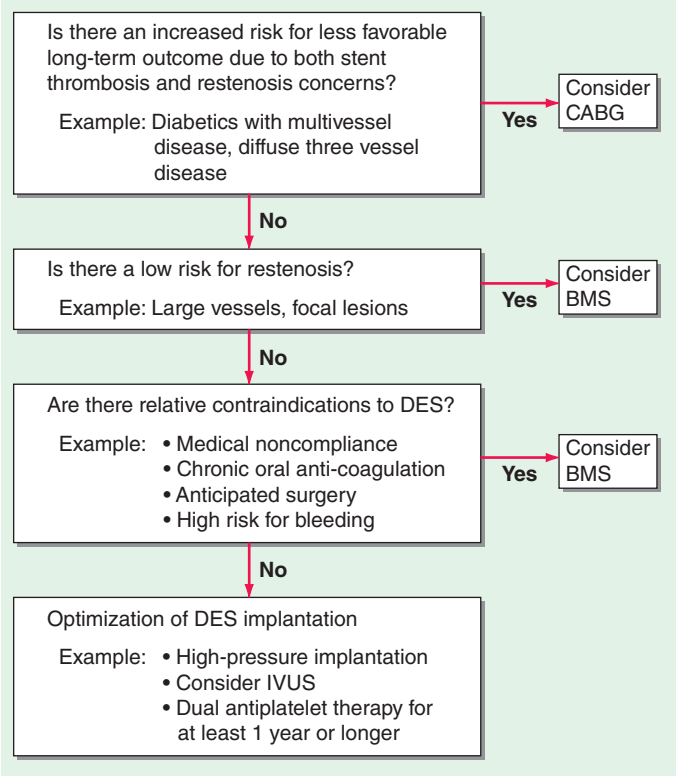

FIGURE 296e-4 In patients requiring revascularization, several factors need to be considered in choosing between bare metal stents, drug-eluting stents, or coronary artery bypass surgery. ACS, acute coronary syndrome; BMS, bare metal stent; CABG, coronary artery bypass grafting; DES, drug-eluting stent; IVUS, intravascular ultrasound; STEMI, ST-segment elevation myocardial infarction. *(From AA Bavry, DL Bhatt: Circulation 116:696, 2007; with permission.)*