

CORONARY ARTERY DISEASE

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What is coronary artery disease? Coronary artery disease (CAD) is the build up of plaque on the walls of one or more of the coronary arteries, narrowing the size of the arteries and causing a decreased flow of blood to the muscles and nerves of the heart. When this happens, the muscles and nerves malfunction and pain occurs. This pain is called angina. The breakdown of the plaques, tearing of the artery walls and blood clots are usually the cause of a heart attack (infarction).¹

Atherosclerosis. The process of plaque build up is called atherosclerosis. The name, derived from the Greek, refers to the thickening of the arterial intima (*sclerosis*, “hardening”) and accumulation of lipid (*athere*, “gruel”). Lipoprotein particles transport lipids such as cholesterol and triglycerides in association with proteins and phospholipids that render the lipids soluble in blood. Low-density lipoprotein (LDL) particles, rich in cholesterol, are an example of an atherogenic lipoprotein. Atherosclerosis is the leading cause of death and disability in the developed world.²

Risk factors for atherosclerosis. Hypercholesterolemia, low HDL (high-density lipoprotein) level, hypertension, male gender, diabetes mellitus, family history of premature CAD, cigarette smoking, post-menopausal state, hyperfibrinogenemia, hyperhomocysteinemia, physical inactivity and obesity.³

Treatment of CAD. There are three methods to treat CAD: medical therapy, angioplasty and bypass surgery. Angioplasty and bypass surgery are the two most commonly used invasive procedures when treatment with medication is unsuccessful. Complementary therapies include control of diet, lowering high blood pressure, and control of diabetes if the patient is diabetic. With proper medical care and responsibility on the patient’s part, a patient can return to an active, normal, healthy and productive life.⁴

Which kind of invasive procedure should be performed? Percutaneous transluminal coronary angioplasty (PTCA) is a widely used method to achieve revascularization of the myocardium in patients with symptomatic ischemic heart disease and suitable stenosis of epicardial coronary arteries. Whereas patients with stenosis of the left main coronary artery and those with three-vessel CAD (especially with associated impaired left ventricular function) who require revascularization are best treated with coronary bypass surgery, PTCA is widely employed in patients with symptoms and evidence of ischemia due to stenosis of one or two vessels, and even selected patients with three–vessel disease, and may offer many advantages over surgery.⁵

Are invasive procedures safe? In experienced hands, the overall mortality rate for patients undergoing PTCA should be less than 1 percent, the need for emergency coronary surgery less than 3 percent, and the occurrence of clinical myocardial infarction less than 5 percent of cases. Minor complications occur in 5 to 10 percent of the patients and include occlusion of a branch of a coronary artery and complications of arterial catheterization. For patients undergoing coronary artery bypass grafting (CABG), the operation is relatively safe, with mortality rates less than 1 percent when the procedure is performed by an experienced surgical team in patients without serious comorbid disease and normal left ventricular function. Intraoperative and postoperative mortality increases with the degree of ventricular dysfunction, comorbidities, age above 80 years, and surgical inexperience.⁶

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Are invasive procedures effective? Patients with intractable chest pain fare best when treated with an aggressive strategy that includes an early procedure – angioplasty or bypass surgery – to restore normal blood flow to the heart. In one study, the authors compared 1-year results for 2,457 unstable angina patients treated with either an invasive (early procedure in most patients) or a noninvasive (late or no procedure in most patients) strategy. The death risk during the first 12 months for patients treated with an invasive strategy was 43 percent less than that for patients not treated with an early procedure. Overall, 2.2 percent of the patients in the invasive group died in the first year compared with 3.9 percent in the noninvasive group. Similarly, heart attacks were reduced by 26 percent in the patients assigned to an invasive strategy. *Compared to the noninvasive strategy group, patients assigned to the invasive strategy required fewer hospitalizations and procedures after the initial hospitalization, the investigators observed.*⁷ In another study, which compared the 5-year survival rates for patients who were treated medically and those who underwent PTCA and CABG between 1984 and 1990, patients with 3- or 2-vessel disease with proximal severe LAD stenosis treated with CABG *had significantly better 5-year survival rates* than those who received medical treatment or PTCA.⁸ According to Dr. Bruce Hensel, M.D., Chief Medical Correspondent for drkoop.com, “Angioplasty and bypass can save lives. The most important thing is to treat the cause of the chest pain before it leads to irreversible heart damage.”⁹ *These interventions should be employed in conjunction with but do not replace the continuing need to modify risk factors.*¹⁰

Treatment Statistics. 686,000 angioplasties were conducted in the United States in 1997. Of these, 447,000 were PTCA. More men (459,000) than women (227,000) received angioplasties. 607,000 CABGs were conducted in the United States in 1997. CABG was performed more often on men (420,000) than on women (187,000).¹¹ The average cost of PTCA in 1995 was \$20,370; for CABG, \$44,820.¹²

(The information contained in this report is not a substitute for medical advice or treatment, and the author recommends consultation with your doctor or health care professional.)

¹ Lowell General Hospital, “Coronary Artery Disease – A Description” (<http://www.lowellgeneral.org/text/CADdescription.html>).

² Anthony S. Fauci [et al], *Harrison’s Principles of Internal Medicine – Fourteenth Edition* (McGraw-Hill, New York), 1998, pages 1345, 1346.

³ *Ibid.*, page 1349.

⁴ Tallahassee Memorial HealthCare, “Coronary Artery Disease – Treatment and Management” (http://tmh.drkoop.com/conditions/coronary_artery_disease/page_33_175.asp).

⁵ Fauci, op cit., page 1372.

⁶ *Ibid.*, page 1372.

⁷ Tallahassee Memorial HealthCare, “Early Intervention Offers Best Bet for Uncontrollable Chest Pain” (http://tmh.drkoop.com/news/stories/july/r/chest_pain.html).

⁸ American College of Cardiology, “ACC/AHA Guidelines for the Management of Patients with Unstable Angina and Non-ST-Segment Elevation Myocardial Infarction” (<http://www.acc.org/clinical/guidelines/unstable/coronary2.htm>).

⁹ Bruce Hensel, M.D., “Information is Key” (http://tmh.drkoop.com/news/stories/september/r/heart_patients.html).

¹⁰ Fauci, op. cit., page 1372.

¹¹ American Heart Association, “Angioplasty and Cardiac Revascularization Treatments and Statistics” (http://www.americanheart.org/Heart_and_Stroke_A_Z_Guide/angioc.html).

¹² American Heart Association, “Medical Procedures, Facilities and Costs” (<http://www.americanheart.org/stastics/09medicl.html>).