associated defect such as a PDA partially compensates for the obstruction by shunting blood from the aorta to the pulmonary artery and into the lungs.

Clinical manifestations: Patients may be asymptomatic; some have mild cyanosis or HF. Progressive narrowing causes increased symptoms. Newborns with severe narrowing are cyanotic. A loud systolic ejection murmur at the upper left sternal border may be present. However, in severely ill patients, the murmur may be much softer because of decreased cardiac output and shunting of blood. Cardiomegaly is evident on chest radiography. Patients are at risk for BE.

Surgical treatment: In infants, transventricular (closed) valvotomy (Brock procedure) is the surgical treatment. In children, pulmonary valvotomy with CPB is the surgical treatment. Need for surgical treatment is rare with widespread use of balloon angioplasty techniques.

Nonsurgical treatment: Balloon angioplasty in the cardiac catheterization laboratory to dilate the valve. A catheter is inserted across the stenotic pulmonic valve into the pulmonary artery, and a balloon at the end of the catheter is inflated and rapidly passed through the narrowed opening (see figure at right). The procedure is associated with few complications and has proved to be highly effective. It is the treatment of choice for discrete PS in most centers and can be done safely in neonates.

Prognosis: The risk is low for both surgical and nonsurgical procedures; mortality is lower than 1% and slightly higher in neonates (Park, 2014). Both balloon dilation and surgical valvotomy leave the pulmonic valve incompetent because they involve opening the fused valve leaflets; however, these patients are clinically asymptomatic. Long-term problems with restenosis or valve incompetence may occur.

ACE, Angiotensin-converting enzyme; *AS,* aortic stenosis; *BE,* bacterial endocarditis; *BP,* blood pressure; *COA,* coarctation of the aorta; *CPB,* cardiopulmonary bypass; *HF,* heart failure; *IV,* intravenous; *PDA,* patent ductus arteriosus; *PS,* pulmonic stenosis.