first weeks of life. The continued patency of this vessel allows blood to flow from the higher pressure aorta to the lower pressure pulmonary artery, which causes a left-to-right shunt.

Pathophysiology: The hemodynamic consequences of PDA depend on the size of the ductus and the pulmonary vascular resistance. At birth, the resistance in the pulmonary and systemic circulations is almost identical so that the resistance in the aorta and pulmonary artery is equalized. As the systemic pressure comes to exceed the pulmonary pressure, blood begins to shunt from the aorta across the duct to the pulmonary artery (left-to-right shunt). The additional blood is recirculated through the lungs and returned to the left atrium and left ventricle. The effects of this altered circulation are increased workload on the left side of the heart, increased pulmonary vascular congestion and possibly resistance, and potentially increased right ventricular pressure and hypertrophy.

Clinical manifestations: Patients may be asymptomatic or show signs of HF. There is a characteristic machinery-like murmur. A widened pulse pressure and bounding pulses result from runoff of blood from the aorta to the pulmonary artery. Patients are at risk for BE and pulmonary vascular obstructive disease in later life from chronic excessive pulmonary blood flow.

Medical management: Administration of indomethacin (a prostaglandin inhibitor) has proved successful in closing a PDA in preterm infants and some newborns.

Surgical treatment: Surgical division or ligation of the patent vessel is performed via a left thoracotomy. In a newer technique, video-assisted thoracoscopic surgery, a thoracoscope and instruments are inserted through three small incisions on the left side of the chest to place a clip on the ductus. The technique is used in some centers and eliminates the need for a thoracotomy, thereby speeding postoperative recovery.

Nonsurgical treatment: Coils to occlude the PDA are placed in the catheterization laboratory in many centers. Preterm or small infants (with small-diameter femoral arteries) and patients with