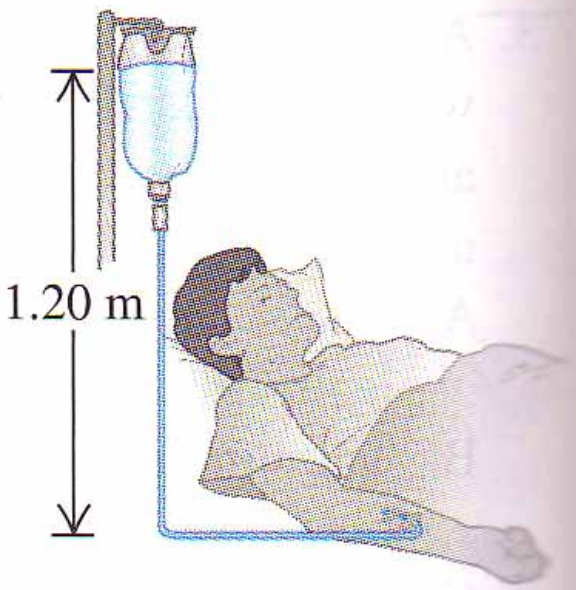
1. • You purchase a rectangular piece of metal that has dimensions 5.0 mm × 15.0 mm × 30.0 mm and mass 0.0158 kg. The seller tells you that the metal is gold. To check this, you compute the average density of the piece. What value do you get? Were you cheated?

14. • **Glaucoma.** Under normal circumstances, the vitreous BIO humor, a jelly-like substance in the main part of the eye, exerts a pressure of up to 24 mm of mercury that maintains the shape of the eye. If blockage of the drainage duct for aqueous humor causes this pressure to increase to about 50 mm of mercury, the condition is called *glaucoma.* What is the *increase* in the total force (in newtons) on the walls of the eye if the pressure increases from 24 mm to 50 mm of mercury? We can quite accurately model the eye as a sphere 2.5 cm in diameter.

17. • **Intravenous feeding.** A hospital BIO patient is being fed intravenously with a liquid of density 1060 kg/m^3. (See Figure 13.40.) The container of liquid is raised 1.20 m above the patient's arm where the fluid enters his veins. What is the pressure this fluid exerts on his veins, expressed in millimeters of mercury?



▲ **FIGURE 13.40**

23. •• A barrel contains a 0.120 m layer of oil of density 600 kg/m^3 floating on water that is 0.250 m deep. (a) What is the gauge pressure at the oil–water interface? (b) What is the gauge pressure at the bottom of the barrel?