

**TABLE 13.1 Characteristics of Blood Vessels**

Arteries				
Vessel	Diameter	Tunica intima (inner layer)	Tunica media (middle layer)	Tunica adventitia (outer layer)
Large artery (elastic artery)	>10 mm	Endothelium Connective tissue Smooth muscle	Smooth muscle Elastic lamellae	Connective tissue Elastic fibers Thinner than tunica media
Medium artery (muscular artery)	2–10 mm	Endothelium Connective tissue Smooth muscle Prominent internal elastic membrane	Smooth muscle Collagen fibers Relatively little elastic tissue	Connective tissue Some elastic fibers Thinner than tunica media
Small artery	0.1–2 mm	Endothelium Connective tissue Smooth muscle Internal elastic membrane	Smooth muscle (8–10 cell layers) Collagen fibers	Connective tissue Some elastic fibers Thinner than tunica media
Arteriole	10–100 $\mu$ m	Endothelium Connective tissue Smooth muscle	Smooth muscle (1–2 cell layers)	Thin, ill-defined sheath of connective tissue
Capillary	4–10 $\mu$ m	Endothelium	None	None
Veins				
Vessel	Diameter	Tunica intima (inner layer)	Tunica media (middle layer)	Tunica adventitia (outer layer)
Postcapillary venule	10–50 $\mu$ m	Endothelium Pericytes	None	None
Muscular venule	50–100 $\mu$ m	Endothelium	Smooth muscle (1–2 cell layers)	Connective tissue Some elastic fibers Thicker than tunica media
Small vein	0.1–1 mm	Endothelium Connective tissue Smooth muscle (2–3 layers)	Smooth muscle (2–3 layers continuous with tunica intima)	Connective tissue Some elastic fibers Thicker than tunica media
Medium vein	1–10 mm	Endothelium Connective tissue Smooth muscle Internal elastic membrane in some cases	Smooth muscle Collagen fibers	Connective tissue Some elastic fibers Thicker than tunica media
Large vein	>10 mm	Endothelium Connective tissue Smooth muscle	Smooth muscle (2–15 layers) Cardiac muscle near heart Collagen fibers	Connective tissue Some elastic fibers, longitudinal smooth muscles Much thicker than tunica media

transforming growth factor  $\beta$  (TGF- $\beta$ ). Endothelial cells function in the conversion of angiotensin I to angiotensin II in the renin-angiotensin system that controls blood pressure, as well as in the inactivation or conversion of a several compounds conveyed in the blood

(norepinephrine, thrombin, prostaglandins, bradykinin, and serotonin) to inactive forms.

- **Modification of the lipoproteins** occurs by oxidation. Lipoproteins, mainly LDLs with a high cholesterol content and very low-density lipoproteins (VLDLs), are oxidized by