

Basic adventitia: thin
layer of connective
tissue containing



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Basic arterial physiology : In essence, all blood vessels consist of a tube with a luminal lining of endothelial cells surrounded by varying amounts of smooth muscle cells and extracellular matrix (ECM) (5). There are five major types of vessels; arteries, arterioles, veins, venules and capillaries. The structure of each of these components varies in different parts of the vasculature according to functional needs(6). To accommodate pulsatile flow and higher blood pressures, arterial walls are thicker than veins and invested with reinforcing layers of smooth muscle cells.

As arteries narrow to arterioles, the ratio of wall thickness to lumen diameter increases, to allow more precise regulation of intravascular pressures. Veins, on the other hand, are distensible thin-walled vessels with high capacitance. In keeping with these specializations, certain pathologic lesions characteristically involve particular kinds of vessels. For example, atherosclerosis occurs mainly in larger, muscular arteries, while hypertension affects small arterioles, and specific forms of vasculitis selectively involve vessels of only a certain caliber(5). Vessel walls are organized into three concentric layers intima, media, and adventitia (see Fig.

1-7): The tunica intima: is the innermost layer of the vessels mainly made up by one layer of endothelial cells. With the exception that the capillaries have only the tunica intima, the arteries and veins also possess the other two layers(3). Tunica Media: The tunica media is comprised of 40-70 fenestrated elastic membranes with smooth muscle cells and collagen between these lamellae.

It is the thickest part of an elastic artery(3). Tunica Adventitia: Thin layer of connective tissue containing lymphatics, nerves and vasa vasorum (Blood vessels that supply blood to the artery - arteries need blood to survive just like any other tissue)(3). An external elastic lamina is present in some arteries and defines the transition between media and adventitia. Diffusion of oxygen and nutrients from the lumen is adequate to sustain thin-walled vessels and the innermost smooth muscle cells of all vessels. In large and medium-sized vessels, however, small arterioles within the adventitia (called vasa vasorum—literally, “ vessels of the vessels”) supply the outer half to two-thirds of the media(5) .