

Vessels chapter 19 summary



**ASSIGN
BUSTER**

3 Basic structures of blood vessel tunica intima tunica media tunica adventitia

Tunica intima parts endothelium, subendothelial layer, elastic lamina

Tunica media external elastic lamina Tunica externa external wall, not

much to it really What do arteries do? convert output of heart to steady flow

through the capillaries What does elastic artery do? conducts

they're thick walled arteries near heart, like the aorta and its major

branches most elastic

diameter ranges from 2.5 cm to 1 cm

What does muscular artery do? distribute What do arterioles do? they

function as high resistance vessels which regulate distribution of flow to

capillary beds Arteries do what? carry blood AWAY from heart Veins do what?

carry blood TO heart Pulmonary arteries? carry deoxygenated blood from

Right Ventricle Arteries branch into? smaller branches called

arterioles Arterioles branch into? capillaries Capillaries are what? site of

nutrient exchange, fluid exchange, gas exchange, etc. Every cell is near a

capillary for pick me ups.

They flow into larger vessels that head back to heart later, called venules

Venules collection of capillaries that are headed back to the heart

in the vein category

and venules flow into bigger vessels called veins, which drain into the heart

Artery structure big, thick, round. They can stand up on their own.

Surrounded by smooth muscle, which is regulated by Autonomic NS, so it can change diameter as necessary.

Finally, it has a Fibrous CT that surrounds whole artery, so it provides structure cuz of toughness.

very flexible. It has to be because heart pump force.

All vessels contain what layer? endothelium, made of special endothelial tissue that lines vessels
Capillaries are only made of what? endothelium, thin layer of squamous endothelial tissue because it exchanges nutrients, so it's easier for things to get through
Arterioles structure NO fibrous tissue

lots of smooth muscle, NO elastic tissue

Arterioles, because of lots of smooth muscle, function in changing diameter of the vessel which changes the amount of blood that can be in that part of the body

Capillary just endothelium

entire function is nutrient and gas exchange

Venules surrounded by fibrous tissue not too stretchy
The first vessels to branch off ascending aorta are R and L Coronary Arteries
Venous blood is collected in what? before it empties into R Atrium? coronary sinus
Elastic arteries are conducting arteries, large arteries close to heart, expand during contraction acting as pressure reservoirs, and then recoil during diastole to keep blood moving.
Muscular arteries are what? distributing arteries that carry blood to specific organs

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they're less stretchy and more active in vasoconstriction

Arteriosclerosis degenerative vascular disease that decreases elasticity of arteries

due to formation of fatty subendothelial lesions

The most permeable capillaries are sinusoids, which are wide channels. 2nd most permeable capillaries are fenestrated capillaries with pores. Least permeable capillaries are continuous capillaries, due to lack of pores. Vascular shunts do what? connect terminal arteriole and postcapillary venule at opposite ends of capillary bed. Most true capillaries arise from and rejoin the shunt channels. Amount of blood flowing into true capillaries is regulated by precapillary sphincters. Veins have larger what? than arteries lumens. Why are most veins only partially filled? so they can be blood banks or reservoirs. Joining together of arteries to provide alternate channels for blood to reach same organ is called anastomosis.

Vascular anastomosis also forms between veins, between arterioles, and between venules

What is blood flow? amount of blood flowing through a vessel, an organ, or entire circulation in a given period of time. What is blood pressure? Blood pressure is the force per unit area exerted on a vessel wall by the contained blood. Blood resistance? opposition to blood flow

blood viscosity aka thickness and vessel length and diameter contribute to resistance

Blood viscosity? thickness or gooeyness Blood pressure is directly proportional to _____ and inversely proportional to _____. directly proportional to blood pressure

inversely proportional to resistance

Systemic BP is highest and lowest in what area? highest in aorta

lowest in venae cavae

Steepest drop in BP occurs in _____, where resistance is greatest.

arterioles Arterial BP depends on what? compliance of elastic arteries and on how much blood is forced into them. Systolic pressure Arterial blood pressure is pulsatile and peaks during contraction Diastolic pressure during diastole, the phase of the heartbeat when the heart muscle relaxes and allows the chambers to fill with blood,

as blood is forced distally into circulation by rebound of elastic arteries, Arterial BP drops to its lowest value.

Pulse pressure is systolic pressure minus diastolic pressure Mean arterial pressure is diastolic pressure plus one third of pulse pressure and is the pressure that keeps blood moving throughout the cardiac cycle Why is Capillary pressure low? so the delicate walls don't rupture, and it allows enough nutrient exchange through the walls BP varies directly with CO, peripheral resistance, and blood volume.

Vessel diameter is major factor determining resistance, and small changes in the diameter of vessels, especially arterioles, affect BP

BP regulated by Autonomic neural reflexes involving baroreceptors or chemoreceptors,

the vasomotor center, which is a medullary center that regulates blood vessel diameter,

and Sympathetic vasomotor fibers, which act on vascular smooth muscle

when BP falls, what happens to get it back up? the fall stimulates vasomotor center to increase vasoconstriction and the cardioacceleratory center to increase heart rate and contractility. when BP is too high, what happens to get it down? rising BP inhibits the vasomotor center and activates

cardioinhibitory center True or False? Higher brain centers like cerebrum or hypothalamus may modify neural controls of BP via medullary

centers True list Hormones that increase BP by promoting

vasoconstriction Epinephrine NE, ADH, angiotensin III list Hormones that reduce

BP by promoting vasodilation include atrial natriuretic peptide, which also causes a decline in blood volume How do Kidneys regulate blood Volume?

rising BP enhances filtrate formation and fluid losses in urine

falling BP causes kidneys to retain more water, increasing blood volume

How do you assess cardiovascular efficiency? measure pulse and BP What is

Pulse anyway? alternating expansion and recoil of arterial walls with each

heartbeat. are Pulse and Pressure points the same thing? Yes sir Normal BP in adults is? 120, 80.

the first number is systolic, and the second is diastolic

BP numbers for people with Hypertension 140 over 90 High BP indicates increased peripheral resistance, which strains the heart and promote vascular complications of other organs, particularly the eyes and kidneys. It is a major cause of myocardial infarct, stroke, and renal disease. Risk factors are high fat, high salt diet, obesity, diabetes, mellitus, advanced age, smoking, stress, being black? Blood flow is involved in delivering nutrients and wastes to and from cells, gas exchange, absorbing nutrients, and forming urine. Blood flows fastest when _____ and slowest when _____. fastest where the cross sectional area of the vascular bed is least, like in the aorta

slowest where the total cross sectional area is greatest, like in the capillaries. Slow flow in capillaries allows for nutrient-waste exchange time.

Auto-regulation is? local adjustment of blood flow to individual organs based on their immediate requirements.

so it involves myogenic or muscular control that maintain flow despite change in BP and local chem factors

Vasodilators are and include? medicines that help to widen vessels to lower BP

they include increased CO₂, hydrogen, and nitric oxide.

Decreased Oxygen concentrations also cause vasodilation.

other factors like endothelins, decrease blood flow

In most instances, autoregulation is controlled by oxygen deficits and accumulation of local metabolites. Autoregulation in the brain is controlled primarily by a drop in pH and by myogenic mechanisms.

Vasodilation of pulmonary circuit vessels occurs in response to high levels of O₂.

What passes through capillary walls by diffusion? nutrients, gases, and other solutes. What moves through clefts or fenestrations? water soluble substances. What moves through lipid portion of endothelial cell membrane of capillary? fat soluble substances. Larger molecules that can't pass through capillary walls or apparatus are transported by pinocytotic vesicles aka the infoldings in the membrane like a pouch,

or caveolae.

In general, fluid flows out of the capillary bed at the _____ end and reenters at the _____ end. enters at arterial end

reenters at venule end

The small net loss of fluid and protein in interstitial space is collected by _____ and returned to the cardio system. lymphatic vessels. Circulatory shock occurs when _____ is inadequate perfusion, the process of a body delivering blood to a capillary bed in its tissue. Pulmonary circulation transports O₂ poor, CO₂ laden blood to lungs for oxygenation. Systemic circulation transports O₂ rich blood from Left Ventricle to all body via Aorta and its branches.

Venous blood returning is delivered to Right Atrium via Vena Cavae

All arteries are _____, while veins are both _____ and _____. All Arteries are Deep

Veins are both deep/superficial, and superficial veins have tons of interconnections

what are some unique venous drainage patterns? Dural venous sinuses, and Hepatic portal circulation
Conducting arteries are elastic arteries with large lumens, low resistance pathways that conduct blood from heart to medium sized arteries
3 types of capillaries? CONTINUOUS capillaries, abundant in skin and muscles, most common. Have unjoined membrane gaps called intercellular clefts, which are big enough to allow limited passage of fluids + small solutes

FENESTRATED capillaries, similar to continuous, except have pores, which are more permeable to fluids + solutes

SINUSOIDAL capillaries. highly modified, leaky capillaries only in Liver, Bone marrow, Spleen, and Adrenal Medulla. Big, weird shaped lumens. They have pores or fenestrations.

Why different types of capillaries? allow large molecules and even blood cells to pass between blood and surrounding tissues. Hepatic macrophages, do what where? remove and destroy contained bacteria,

in lining of sinusoid capillaries in Liver

Microcirculation is? flow of blood from an arteriole to a venule, through a capillary bed. Capillary bed consists of 2 types of vessels1. Vascular Shunt, a short vessel that directly connects arteriole and venule at opposite ends of bed

2. True Capillaries, actual exchange vessels.

Flow through capillary bedThe terminal arteriole that feeds bed leads into a metarteriole, which is continuous with the thoroughfare channel, which is an intermediate between arteriole and capillary bed,

joins the post-capillary venule that drains the bed

Pre-Capillary Sphincter is? cuff of smooth muscle fibers that surrounds root of each true capillary at metarteriole and acts as a valve to regulate blood flow into capillary