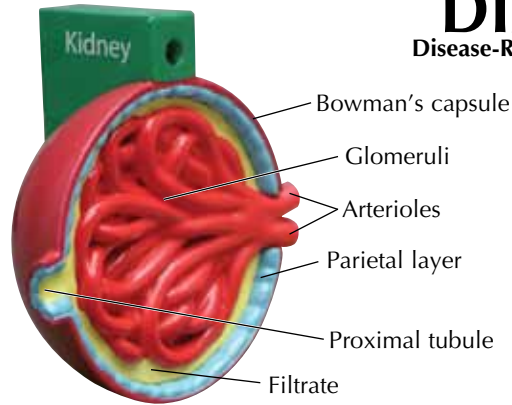


DIABETES

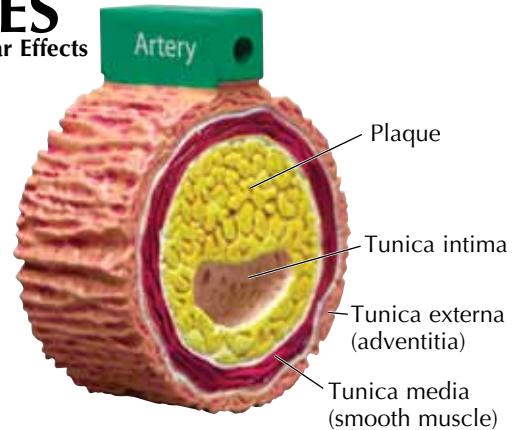
Disease-Related Vascular Effects



Diabetic Nephropathy

Diabetic nephropathy is kidney disease or damage that happens as a result of diabetes. This damage begins in the glomeruli, which are small clusters of blood vessels that filter urine from the blood. The high blood sugar and blood pressure of diabetics causes thickening and hardening of the glomeruli. This leads to decreased function and eventual destruction of the glomerulus. The first indication of decreased kidney function is proteinuria, which is high levels of protein in the urine. As kidney function diminishes, the body becomes unable to filter the blood and remove wastes. If the condition becomes critical, dialysis or a kidney transplant is needed to allow the body to function.

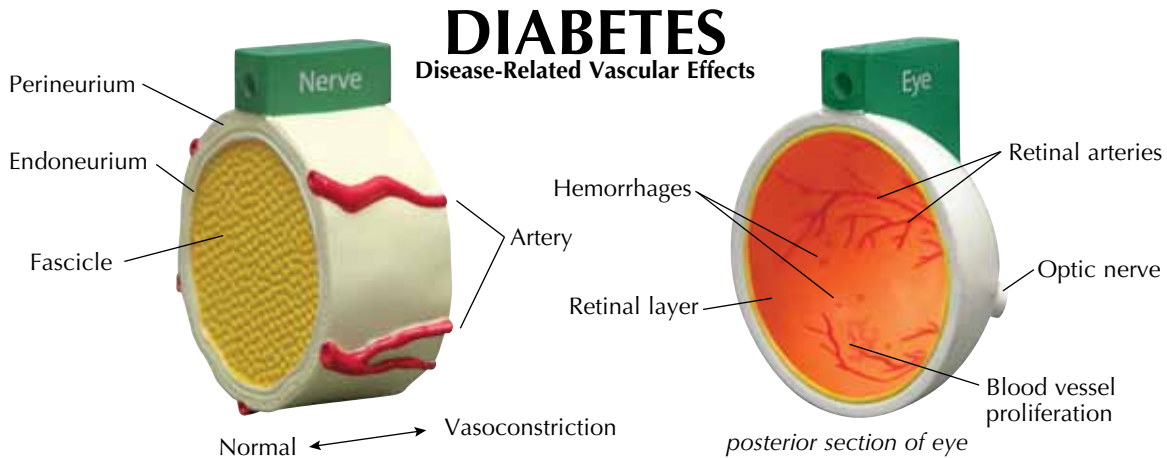
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Atherosclerosis

Atherosclerosis (hardening of the arteries) is caused by the buildup of fatty deposits called plaque within the inner walls of arteries. Plaque causes blood vessels to harden and lose elasticity, leading to blockage and higher probability of a stroke or heart attack. Diabetes accelerates the progression of atherosclerosis in multiple ways. High blood sugar in diabetics causes an increase in free radicals, which in turn cause premature death of cells lining the interior of blood vessels. This reduces the amount of nitric oxide in the blood, which then causes blood vessels to harden and blood flow to decrease. Poor diet and lack of exercise, which are common amongst diabetics, also accelerate the progression of atherosclerosis.

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Diabetic Neuropathy

Diabetic neuropathy is the condition of neuropathic disorders associated with the presence of diabetes. These conditions are thought to be a result of microvascular injury to blood vessels that supply the nerves. The first pathological change in the microvasculature is vasoconstriction, a narrowing of the artery which limits blood flow and damages the nerve. This causes a decrease in nerve conduction speed that affects longer nerves the most. It begins with a decrease in sensation and loss of reflex in the toes and feet, then progressively moves up the body. Since the nerves also assist in normal functioning of the blood vessel, as nerve function deteriorates so does the function of blood vessels, organs, and other systems of the body.

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Diabetic Retinopathy

Diabetes can cause diabetic retinopathy (retina damage), possibly leading to blindness if not treated properly. Diabetic retinopathy is a condition that causes new blood vessels to proliferate in the back of the eye on the retina. Instead of growing attached to the retina, these vessels grow from the retina into the gel-like vitreous humor within the eye. These vessels are fragile and can hemorrhage blood into the humor, resulting in visible floating spots and blurred vision. Initially, the hemorrhaging might be small and disappear, but it can rapidly increase in both size and frequency. As the hemorrhaging increases, so does the time required for the blood to clear from the vitreous humor, varying from a few days to months or even years.