

Hypertension Model



High blood pressure is one of the first-order risk factors for arteriosclerosis, depicted in the artery on the base. Focal accumulations of different substances lead to constriction or even occlusion of the arteries. The organ belonging to the supply area of the respective arteries receive too little or no oxygen. Affected frequently are the coronary arteries of the heart, cerebral arteries and the renal arteries.



Cerebral Sequelae

The effects generated by high blood pressure on the brain include stroke, massive hemorrhage as well as the so-called acute hypertensive encephalopathy. In the case of stroke, the cerebral regions that are situated within the supply area (painted grey in the model) of arteriosclerotically altered cerebral vessels are subjected to abrupt hypoperfusion.

Ocular Fundus Sequelae

Arteriosclerotic changes can also lead to destruction of parts of the eye. The model shows dilated arteries on the sclera. From the ocular fundus of an hypertensive patient, the physician can draw conclusions about the degree of severity of the existing blood pressure. Constricted arteries, additional retinal hemorrhages, foci of degeneration and swelling of the optic papilla describe the different stages of hypertension. Rupture of degenerated arteries of the retina may lead to loss of eyesight.

Cardiac sequelae

The changes to the vascular walls lead to constriction of the coronary arteries, with this in turn resulting in reduced cardiac blood flow and in the so-called coronary heart disease (CHD). Sequelae may include pain in the thorax and in the left arm, termed angina pectoris, cardiac infarction, i.e. destruction of cardiac muscle tissue (shown in grey color), reduction of cardiac output, cardiac dysrhythmias or sudden death.

Renal Sequelae

Every type of high blood pressure results sooner or later in damage to and constriction of the renal vessels. Hypoperfusion further results in destruction of renal tissue, (marked in grey) which in its final stage is designated as a shrunken kidney. The resultant impairment of renal function can exert more far-reaching, in some cases life-threatening, effects on all body systems and result in complete renal failure.