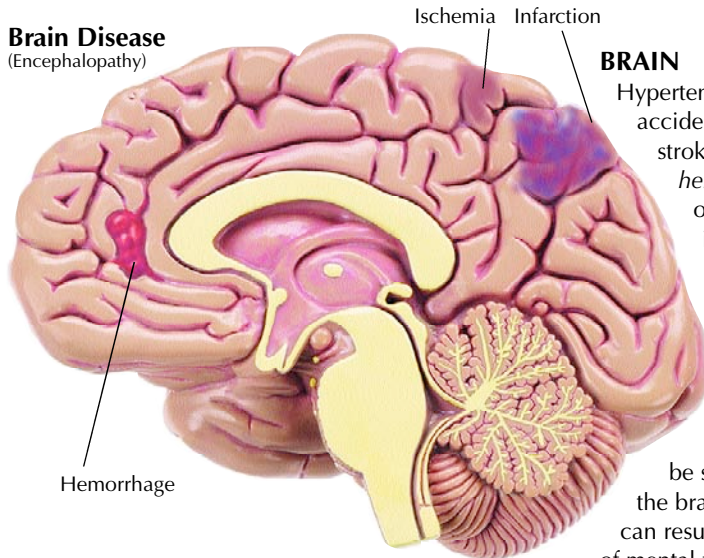


# HYPERTENSION

The three main causes of death resulting from unchecked hypertension (high blood pressure) are myocardial infarction (MI) or heart attack, congestive heart failure (CHF), and cerebral vascular accident (CVA) or stroke.

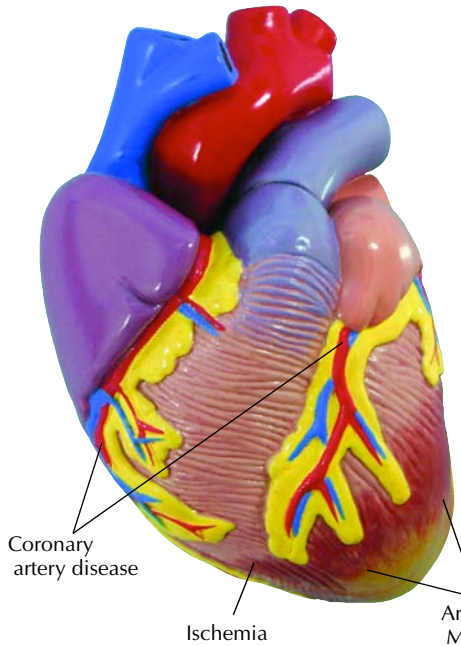
## Brain Disease (Encephalopathy)



## BRAIN

Hypertension can cause a cerebral vascular accident (CVA)(broken blood vessels) or stroke. Strokes are a result of either a *hemorrhage* (bleeding) within the brain or *infarction* (lack of blood flow resulting in irreversible damage or necrosis). Transient *ischemic* attacks (TIA's) occur when there is reduced oxygen flow to the tissues. Symptoms include temporary left or right-sided weakness, slurred speech or visual problems which resolve over time. Because the arteries in the brain may be sclerosed (hardening of the arteries), the brain tissue receives less oxygen which can result in vascular dementia (deterioration of mental faculties including memory, reasoning and personality).

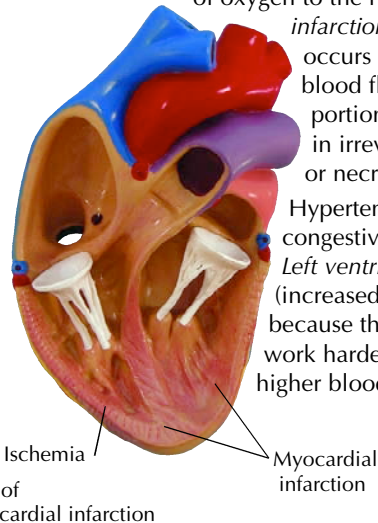
## High blood pressure (Hypertensive heart disease)



## HEART

The atherosclerotic complications (hardening of the arteries) lead to *coronary artery disease* (CAD).

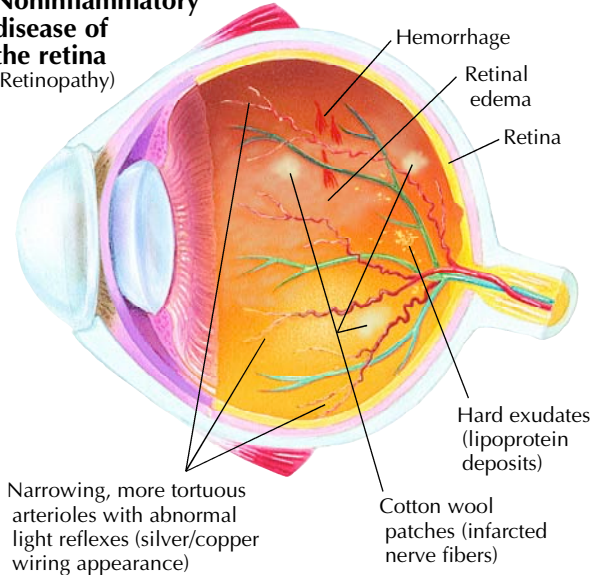
Angina, or chest pain is a consequence of *ischemia* or lack of oxygen to the heart. A *myocardial infarction* (MI) or heart attack occurs when both lack of blood flow and oxygen to a portion of the heart results in irreversible damage or necrosis.



Hypertension facilitates congestive heart failure (CHF). *Left ventricular hypertrophy* (increased muscle mass) occurs because the left ventricle has to work harder due to a consistently higher blood pressure.

# HYPERTENSION

## Noninflammatory disease of the retina (Retinopathy)



## EYE

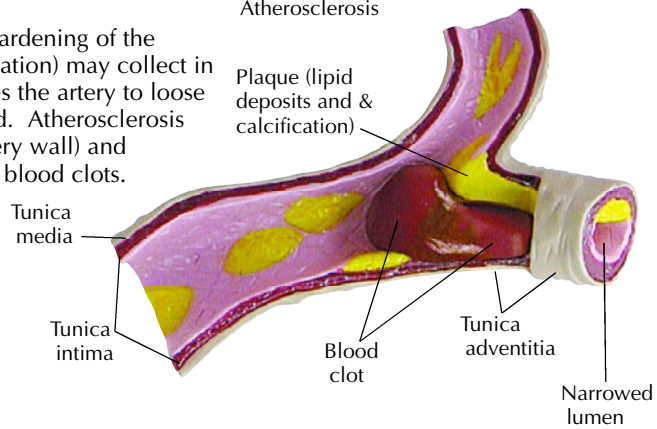
Hypertension causes various changes in the retina (sensory membrane of the eye). These include: typically flame-shaped *hemorrhages*; *retinal edema* (swelling) causing leaking of fluid into the middle retinal layers giving a thickened, or cloudy grayish white color appearance; hard *exudates* (deposits) caused by an accumulation of lipoprotein deposits; *cotton wool* patches which occur when the nerve fibers become infarcted (damaged because of lack of blood flow); and narrowed, more tortuous *arterioles* (the branches of arteries before they become capillaries, the smallest blood vessels between arteries and veins) with abnormal light reflexes (copper or silver wire appearance).

## ARTERIES

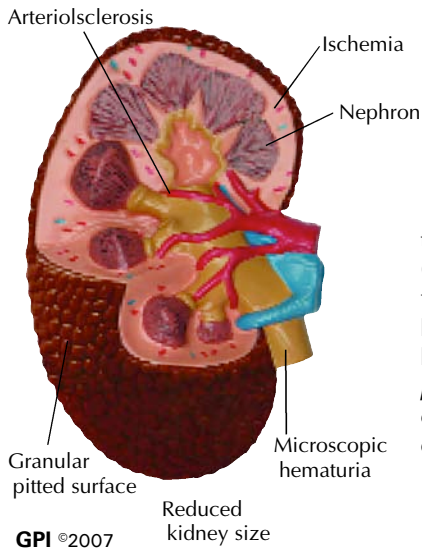
Hypertension can lead to atherosclerosis (hardening of the arteries). Plaque (fatty deposits and calcification) may collect in the inner lining (*tunica intima*) which causes the artery to lose elasticity and can obstruct the flow of blood. Atherosclerosis can cause *arterial dissection* (rupture of artery wall) and coronary artery disease, which may lead to blood clots.

## Hardening of the Arteries

Atherosclerosis



## Hardening of kidney (Nephrosclerosis)



## KIDNEY

Hypertension causes renal (kidney) *arteriosclerosis* (hardening of the arteries in the kidney) which after time causes *nephrosclerosis* (hardening of the kidney). This is a leading cause of chronic renal failure. Nephrosclerosis is the direct result of *ischemia* (lack of blood flow) due to narrowed lumen (opening or space) of the blood vessels. The kidney may be reduced in size with a *granular pitted surface*. Microscopic *hematuria* (blood in the urine) may occur. Microscopically, the closure of the small arteries, destroys entire *nephrons* (the functioning unit that creates the urine).