



Pathology CVS

Done By Dana Obeidat



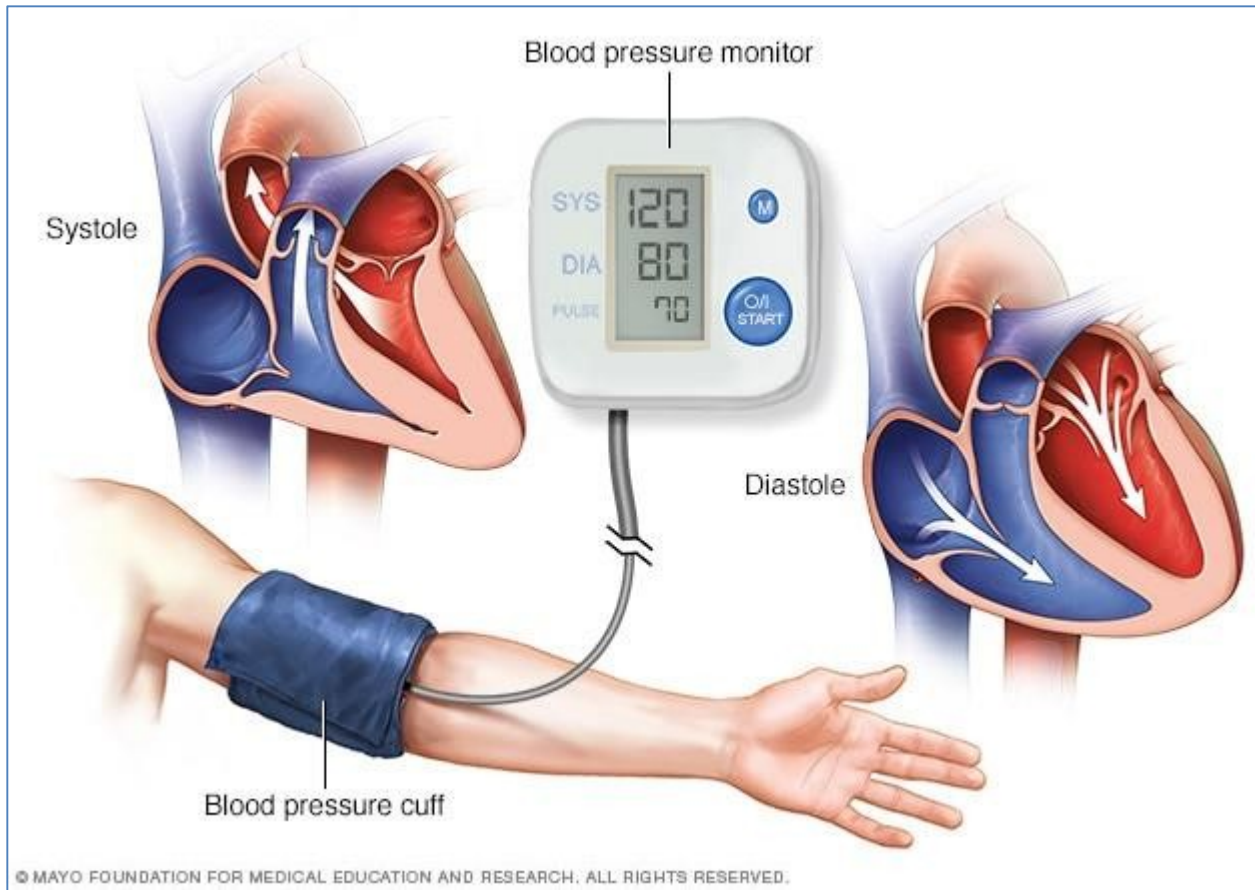
Corrected By Dana Alkhateeb



HYPERTENSIVE VASCULAR DISEASE

Arteriolosclerosis

Dr. Nisreen Abu Shahin
Associate Professor of Pathology
Pathology Department
University of Jordan



A sphygmomanometer or a Digital blood pressure monitor is used to measure BP. **(in both devices we can see 2 measurements the systolic & diastolic blood pressure)**

Blood pressure



- Currently, cutoffs in diagnosing hypertension in clinical practice: sustained diastolic pressures **>80** mm Hg, **and/or** sustained systolic pressures **>130** mm Hg

Types of hypertension

- Classification of Hypertension is:
 1. According to severity: **Benign (95%)** versus **malignant (5%)**
 2. According to cause (Or etiology): **Primary (essential) (95%)** versus **secondary (5%)**
 3. According to side of circulation
that is affected by high blood pressure
: **Systolic vs diastolic**

- ***Malignant hypertension***

→ 5% (also known as accelerated HTN)

→ a rapidly rising blood pressure that, if **untreated**, leads to death within 1 to 2 years

→ **systolic pressures > 200 mm Hg or diastolic pressures > 120 mm Hg**

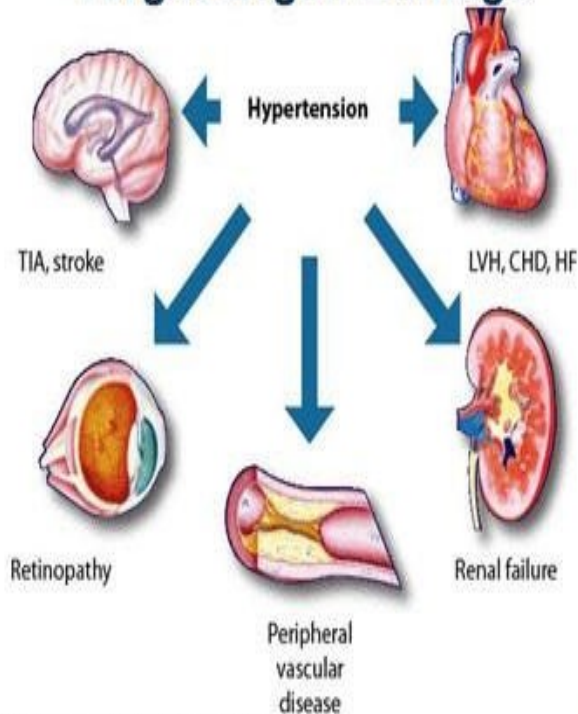
→ renal failure and retinal hemorrhages (**organ damage**)

→ usually superimposed on preexisting benign hypertension (either **essential or secondary**) >> **usually those preexisting hypertension aren't controlled.**

<<Malignant here doesn't mean a tumor or cancer just that it's acute and dangerous (dismal prognosis)>>

Hypertension (HTN) has the following potential complications:

Complications of Hypertension: Target-Organ Damage



TIA, transient ischemic attack; LVH, left ventricular hypertrophy; CHD, coronary heart disease; HF, heart failure

medscape

1. stroke (CVD) & multi-infarct dementia
2. atherosclerotic coronary heart disease
3. cardiac hypertrophy and heart failure (**hypertensive heart disease**)
4. aortic dissection
5. renal failure
6. retinal hemorrhages

Types of hypertension- according to etiology

- 1 **essential (idiopathic) hypertension (95%)**
- 2 **secondary hypertension:**
 - **Most common: renal disease** or renal artery narrowing (**renovascular hypertension**)
 - **Other less common: many other conditions....**

Essential Hypertension

Accounts for 90% to 95% of all cases

Most common of all

Secondary Hypertension

Renal

Acute glomerulonephritis

Chronic renal disease

Polycystic disease

Renal artery stenosis

Renal vasculitis

Renin-producing tumors

Most common of secondary causes

Endocrine

Adrenocortical hyperfunction (Cushing syndrome, primary aldosteronism, congenital adrenal hyperplasia, licorice ingestion)

Exogenous hormones (glucocorticoids, estrogen [including pregnancy-induced and oral contraceptives], sympathomimetics and tyramine-containing foods, monoamine oxidase inhibitors)

Pheochromocytoma

Acromegaly

Hypothyroidism (myxedema)

Hyperthyroidism (thyrotoxicosis)

Pregnancy-induced (pre-eclampsia)

Cardiovascular

Coarctation of aorta

Polyarteritis nodosa

Increased intravascular volume

Increased cardiac output

Rigidity of the aorta

Neurologic

Psychogenic

Increased intracranial pressure

Sleep apnea

Acute stress, including surgery



• *Pathogenesis of essential HTN*

• ? Genetic factors

? familial clustering of hypertension

-angiotensinogen **polymorphisms** and angiotensin II receptor variants; polymorphisms of the renin-angiotensin system.

-? **Susceptibility** genes for essential hypertension: genes that control renal sodium absorption, etc...

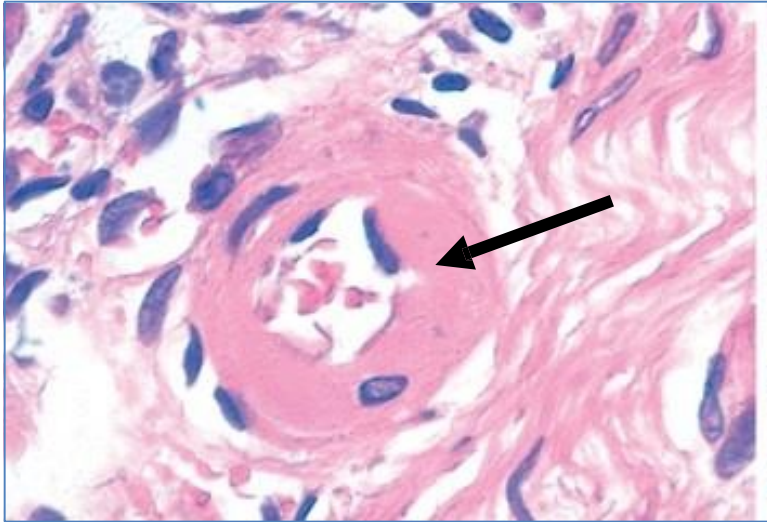
• **Environmental factors** modify the impact of genetic determinants

stress, obesity, smoking, physical inactivity, ↑ salt consumption

Blood vessels in HTN- Morphology

- HTN is associated with **arteriolosclerosis** (small arterial disease (**arterioles**))
- Two forms of small blood vessel disease are hypertension-related:
 - 1 **hyaline arteriosclerosis**
 - 2 **hyperplastic arteriosclerosis**

1- Hyaline arteriosclerosis



- Ass. with benign hypertension
- (Called **Hyaline arteriosclerosis due to** homogeneous pink hyaline thickening of arteriolar walls >> luminal narrowing >> **come from** leakage of plasma components across injured endothelial cells into vessel walls & increased ECM production by smooth muscle cells in response to chronic hemodynamic stress

- Hyaline arteriosclerosis: Complications
- Most significant in **kidneys** → nephrosclerosis (glomerular scarring) and this will lead to chronic renal failure with time
 - -----
- Other causes of hyaline arteriosclerosis:
 - 1- elderly patients (normo-tensive)
 - 2- diabetes mellitus

2- Hyperplastic arteriolosclerosis

- With **severe (malignant)** hypertension
- "**onionskin**" concentric laminated **thickening** of arteriolar walls
>> luminal narrowing **and even complete occlusion of injury or trauma**
- **reduplicated basement membrane** (following the recurrent attacks of **high blood pressure**)
- fibrinoid vessel wall necrosis (**necrotizing arteriolitis**)

Fibrinoid Necrosis - artery

