

# Hypertension

## Pathology Team

These are the companion notes  
for the **HANDOUTS** given by **Dr. Sufia Hussain**  
You can study from: **Them + The Pathology Handouts**

N.B. The” 📖 “means it is an important MCQ

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## Hypertension:

**Silent Killer:** it is Painless, Asymptomatic (has no symptoms) but a person could DIE from it if they wasn't treated/stopped.



**What is the most organ that will be affected/damaged in hypertension?** The heart

### Ranges:

Diastolic > 98mmHg.      Systolic > 139mmHg.  
If it passes these ranges, we call it Hypertension.

p.s. diastolic is the most important in determining the cause/disease of HTN.

### Primary (essential) Hypertension:

Has no identifiable or direct cause although the risk factors increase the possibility of having HTN

→ It is **Multifactorial** we don't know its causes.

### Secondary Hypertension:

A results of an identifiable cause. This type of HTN is **treated differently than essential type** by treating the underlying cause.

#### DISEASES THAT WOULD CAUSE HYPERTENSION (secondary Hypertension)

**Glomerulonephritis:** nephritis characterized by inflammation of glomeruli

**Renal Artery Stenosis:** no blood supply (BP) to kidney → **Atrophic Kidney** (smaller)  
this activates "rennin angiotensin system"

**Adult polycystic Disease** (bubbles in kidney) → **Hypertrophic Kidney** (4 times bigger than normal size of a kidney)

**Chronic Renal Disease – Renin Producing tumors** (rennin activates "angiotensin")

**Thyrotoxicosis:** overactive tissue within thyroid gland/ ↑thyroid hormone

**Primary Aldosteronism:** overproduction of : "**Mineralocorticoid**" hormone (produced by adrenal gland)  
"**Aldosterone**" hormone (produced by adrenal gland)

#### **Cushing's /hypercorticism-hormone disorder:**

↑ Cortisol in blood → bcuz of a tumor (adenoma) in pituitary gland that produce **ACTH**

#### **Acromegaly:**

A chronic disease, marked by enlargement of *bones of extremities – Face – Jaw*  
Caused by: overactivity of pituitary gland

#### **Pheochromocytoma:**

Neuroendocrine tumor of the medulla of the "Adrenal Gland"  
secretes "catecholamines", "noradrenaline" and "adrenaline" that increase the sympathetic tone (↑ H.R → ↑B.P)

**Coarctation of the Aorta:** narrowing of the Aorta

**Kidney Failure will cause → Hypertension // Hypertension will cause → Kidney Failure**

**Mineralocorticoid:** ↑ water retention ⇒ ↑ B. Volume → HTN

**Aldosterone:** Anti-diuretic hormone (prevents going to the bathroom) ↑ water retention ⇒ ↑ B. Volume ⇒ ↑ B.P

**High Intracranial B.P.** → High B.P. in all body

**Benign Hypertension: More common**

**Malignant Hypertension:**

**NOT a tumor, cannot be treated and it causes DEATH**

 **A severe (Malignant) Hypertension is Associated with:** Diastolic pressure over 120mmHg.

 **Why is - Malignant HTN could cause “Cerebrovascular accidents”??**

When blood supply is diminished → necrosis happens in a part of the brain → cause paralysis.

**Stroke:** no blood supply to brain

**Papilledema:** High pressure in the EYE

**Retinal Hemorrhage:** نزيف في شبكة العين

 **Hypertensive Risk Factors:** Factors that increase the risk of having Hypertension

age - elderly - smoking - gender (more in males) - diabetes - Color (Africans)  
obesity - alcoholism - hypercholesterolemia (high cholesterol) - Hereditary

**Regulation**

**Aldosterone** ⇒ ↑ B.P

**Sympathetic Effect:** Vasoconstriction

**Parasympathetic Effect:** Vasodilation

**Heart rate & Contractility:** (depending on multifactorials)

↓ Contraction ⇒ ↓ Blood Pressure

**Etiology = Causes**

“Postulated mechanisms of Essential Hypertension” are more likely predicted to be the reason for it.

**Angiotensin’s Functions:**

- 1- Vasoconstriction (increase in B.P.)
- 2- Stimulate “aldosterone” hormone

**Morphology:**

**-Sclerosis= Thickening**

 **1) Hyaline Arteriosclerosis (in diabetic patients):**

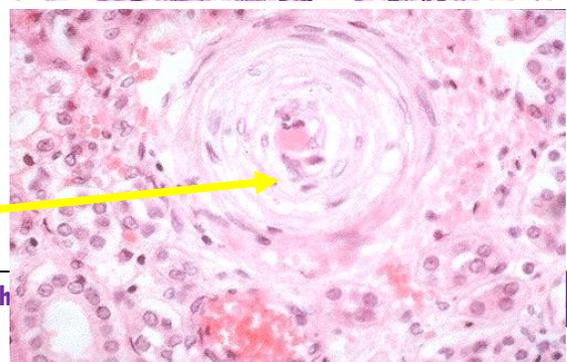
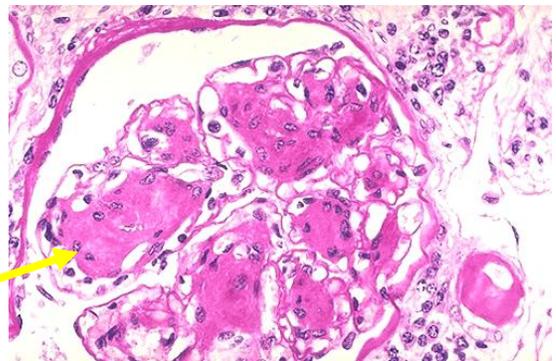
Associated with “pink hyaline narrow lumen”

 **2) Hyperplastic Arteriosclerosis (in malignant Hypertension):**

Associated with “Necrotizing Arteriolitis”

(necrosis in blood vessels is always **Fibrinoid Necrosis**)

Anterior Line is markedly **THICKENED** and lumen is **NARROWED**



### Organ Damage (due to HTN generally)

HTN ⇒ ↑ Peripheral Resistance

⇒ resistance in all branches and in Aorta ⇒ ↑B.P in aorta ⇒ ↑ Lt. Ventricle Contraction

⇒ **Left Ventricle Hypertrophy (LVH)**

HTN ⇒ ↓ Lt. ventricular pressure overload (because of hypertrophy- JUST THICKENING)

⇒ ↑ weight of the Heart ⇒ ↑ overall cardiac size

⇒ Thickness in Lt. Ventricle **impairs** diastolic filling

⇒ **Left Atrial Enlargement**



### Factors indicating Adverse Prognosis in Hypertension

