

# HYPERTENSION-

CHRONIC LONG STANDING

Abnormally Elevated- BP.

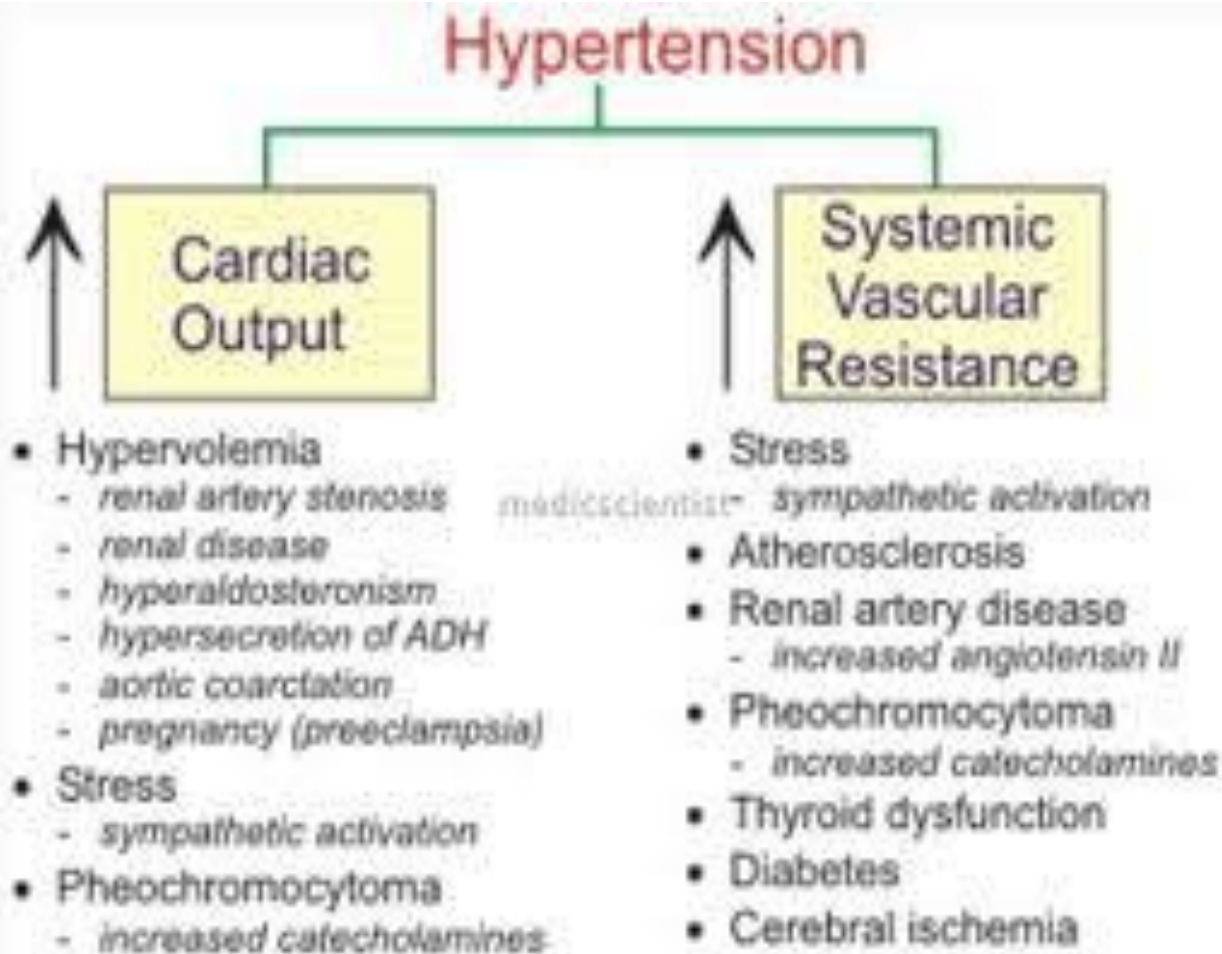
Means high Pressure Force exerted by  
Circulating intra-vascular blood flow  
laterally on blood vessels wall both in systole and diastole.

Systolic BP- measure MAX.. BP- against  
blood vessel wall during LV- contraction- systole.

It is a function of Cardiac out-put in systole.

Diastolic BP- measure the LOWEST BP- in  
diastole during LV- filling before the next systole.  
BP- is maintained by blood vessel wall elasticity  
and compliance - peripheral vascular resistance .

# HPN



# HTN

- HTN- Extremely common clinical problem WORLD WIDE
- Affecting 20-30% of general adult population.
- 40 - 60% and more severe BLACK- AFRICAN

Age related disease 50% after age of 60Y.

>1.3 billion pat. have HTN and

> 4-5 million/ year died from HTN

Both Systolic- Diastolic- HTN-

Carry high risk of Cardiovascular Morbidity and Mortality.

ATHEROSCLEROSIS IHD- MI- LVH- HF-

ARRHYTHMIA - CVA –

PERIPHERAL VASCULAR DISEASE – CKD - BLINDNESS.

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# BRITISH HYPERTENSION SOCIETY

## DEFINITION OF HPN-

Category	Systolic BP (mmHg)	Diastolic BP (mmHg)
BP		
Optimal	< 120	< 80
Normal	< 130	85
High normal	130 – 139	85 – 89
Hypertension		
Grade 1 (mild)	140 – 159	90 – 99
Grade 2 (moderate)	160 – 179	100 – 109
Grade 3 (severe)	> 180	> 110
Isolated systolic hypertension		
Grade 1	140 – 159	< 90
Grade 2	> 160	< 90

# JNC-7 –DEFINITION-HTN

• NORMAL	SYS. BP mmHg	DIASTOLIC-BP
•	<120	<80
• HIGH-NORMAL-	120-139	80-89
• PRE-HTN		
• STAGE-1-	140-149	90-99
• STAGE-2-	>160	>100
• ISOLATED-SYSTOLIC	>140	<90
• HTN		

# JNC-8-2014

- **2014 Evidence-Based Guideline for the Management of High Blood Pressure in Adults Report From the Panel Members Appointed to the**
- **Eighth Joint National Committee (JNC 8)**
- Normal-BP-<120/80
- Pre-HTN-BP-120-139/80-89
- HTN- stage-I-140-159/90-99
- HTN-stage-II->160/100

# The National Institute for Health and Care Excellence- NICE

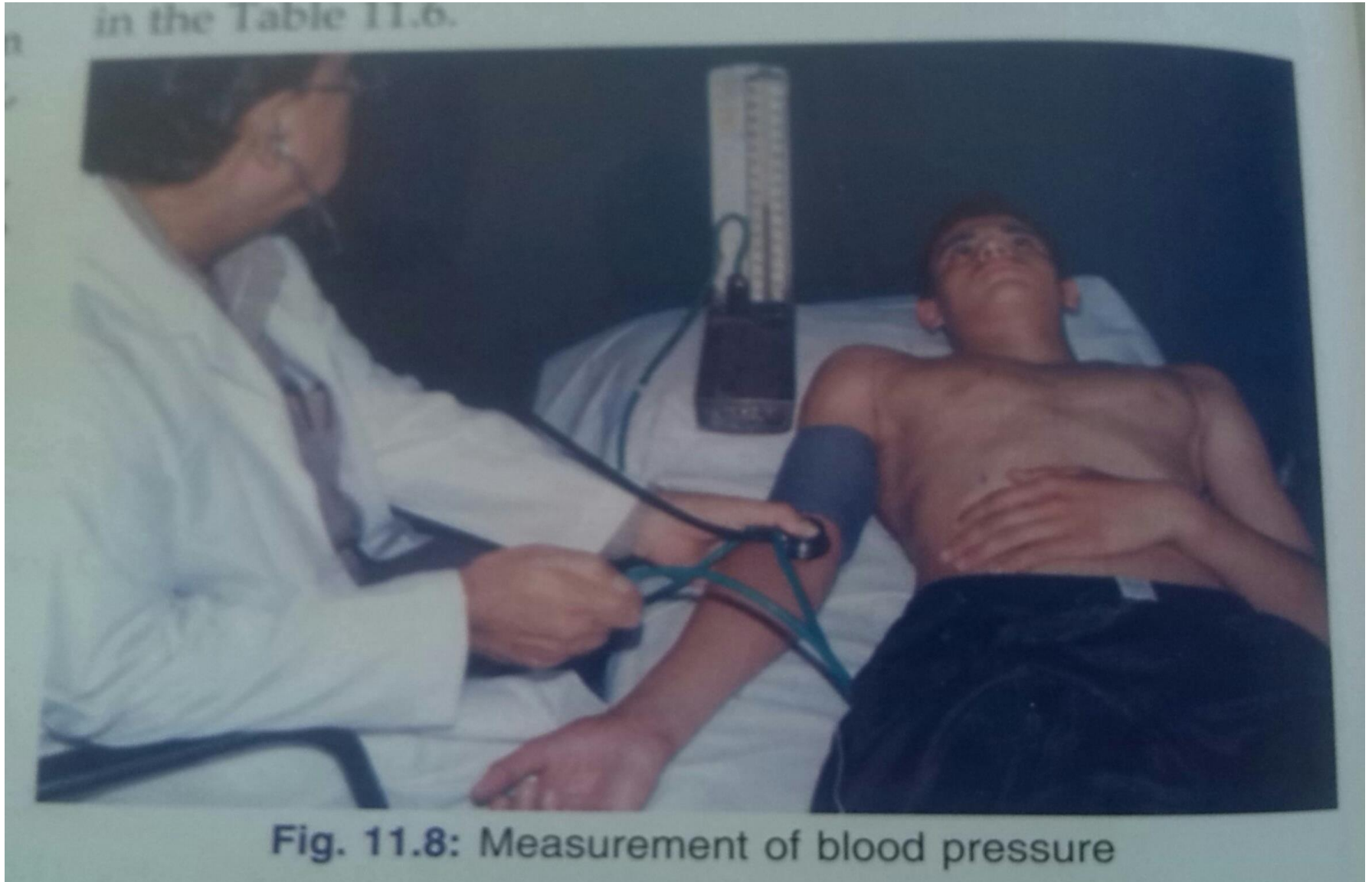
- NICE- 3- Recommended ABPM- Ambulatory
- HBPM- Home
- BP Monitoring for diagnosis of HTN.
- STAGE 1 HTN Clinic BP- 140/90 or
- ABPM- HBPM 135/85 or higher
- STAGE 2 HTN Clinic BP- 160/100 or
- ABPM- HBPM 150/95 or higher
- SEVER 3 HTN Clinic systolic >180 or more
- diastolic >100 or more

# How to measure blood pressure

- 1- Use a machine that has been well maintained and properly calibrated.
- 2- Remove tight clothing from the arm.
  - Pt. should be relaxed for 5 min.
  - To avoid stress and white-coat- HTN.
- 3- Support the arm of pt. at the level of the heart.
- 4- Measure both sitting and standing BP  
Especially in Elderly – Diabetic- Dehydrated – phaeochromocytoma- patients to exclude postural hypotension >20mm Hg drop in BP- after 1-2 min. standing.



# How to measure blood pressure



# How to measure blood pressure

- 5- Use a cuff of appropriate size  
(the bladder must encircle  $> 2/3$  rd of the arm).
- 6- Lower the pressure slowly (2mmHg per second).
- 7- Read the BP to the nearest 2mmHg.
- 8- Use phase V (disappearance of sounds)  
to measure diastolic BP.
- 9- Take two measurements at each visit.
- 10- 24 HOUR -Ambulatory - ABPM- Mointer .  
HOME - HBPM- Machine.  
Labile or White Coat- HTN - MASKED-HTN.

# COMMON PROBLEMS IN BP EXAM.

1. Wrong cuff size.

- Obese pt. larger cuff must be used because
- Normal size cuff will give FALSE high BP- reading.
- Very thin pt. pediatric cuff must be used.

2- Excess pressure of stethoscope on brachial artery wrongly gives lower 10mmHg reading of diastolic BP.

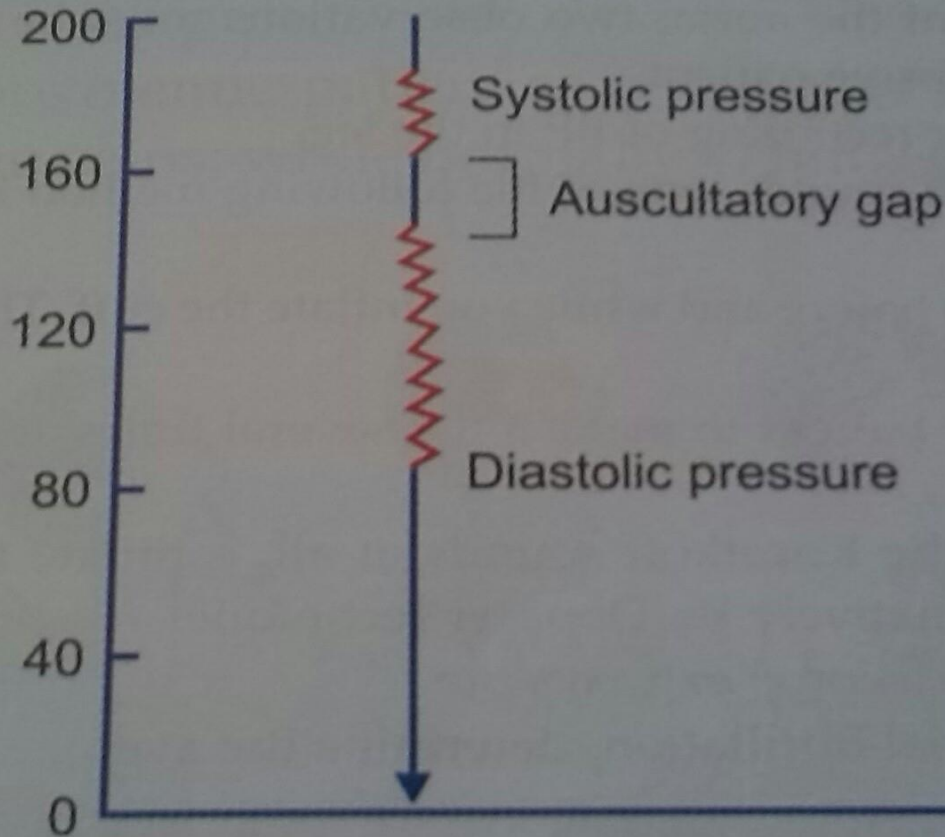
3- Wrong level of pt. arm- elbow to the heart.

- Higher level than the heart level will give lower 5mmHgBP. Lower level will give higher 6mmHgBP.

# COMMON PROBLEMS IN BP EXAM.

4. If BP- difference in both arms  $>10\text{mmHg}$ .
  - Exam. for peripheral vascular disease
  - exclude - Subclavian artery stenosis.
  - Record the highest reading.
- 6- Auscultatory gap- 20% of elderly HTN-
  - After systolic pressure reading
  - Sound disappears then reappears before
  - reading of diastolic pressure.
  - If the first systolic sound missed.
  - Sys. BP will be recorded wrongly low.
  - To avoid this problem palpate radial pulse .

# AUSCULTATORY GAP



**Fig. 11.9:** The korotkoff sounds and an auscultatory gap. If you find an auscultatory gap, record your finding as follows; BP-130/90 with an auscultatory gap from 160-150 mmHg

# AETIOLOGY- MULTI-FACTORIAL

- HTN- a complex interaction between
- Genetics and Environment –life style factors.
- 95% pt. Idiopathic HTN
- 5% pt. Secondary HTN
- Essential - Idiopathic- HTN-
- No specific underlying cause can be identified
- which may be related to following CAUSES.
- I- GENETIC FACTORS
- HTN- has complex genetic disorders
- large number of Genes may be involved in HTN.

# AETIOLOGY-

1- RENIN- ANGIOTENSIN - ALDOSETERON -SYSTEM- GENE

HIGH-RENIN- HTN– YOUNG.

LOW RENIN- HTN- ELDERLY- BLACK

2- ADRENERGIC RECEPTORS- GENE-

- Peripheral vascular resistance and vascular tone

3- VASCULAR ENDOTHELIAL FUNCTIONS –GENE-

- Vasoconstrictors Cytokines
- Angiotensin-II- Endothelin- Thromboxin A2.
- Vasodilators – Cytokines  
Prostaglandin- NO- Prostacyclin.

# AETIOLOGY-

4- Na- and salt Sensitivity –GENE - Salt Sensitive HTN

5- Metabolic GENES-

- Regulator of insulin receptors .
- Hyperinsulinemia and insulin Resistance.
- SYNDROME-X- Metabolic syn.
- Marked central Obesity- Dyslipidemia- DMT2- HTN

II- FAMILIAL FACTORS-HTN-

Children of hypertensive parents tend to have Higher BP- Compared with Children of Normotensive parents.



# AETIOLOGY-

## III- RACIAL- FACTORS - ETHNIC GROUPS-

HTN more common and MORE sever in

BLACK- AFRICAN with higher incidence up to - 40-60%

## IV- FETAL FACTORS –

Low birth wt. babies Impaired intra-uterine growth

- Reduced Small kidneys volume and size

Lower Nephrones number.

Glomerular Hyper-filtration -

Hypertrophy of the remaining Glomeruli.

RENAL- GLOMERULOSCLEROSIS

Higher chance to develop HTN during their adult life.

# AETIOLOGY-

## V- ENVIROMENTAL FACTORES-

- Obesity- Lack of exercise- Alcohol intake- Smoking
- Sleep- Apnea- syn. - Hypoxia
- High Na -ingestion-
- STRESS- SYMPATHETIC OVER DRIVE-HTN
- DRUGS - STEROID – NSAIDS- LICURICE- PILLS.
- All can cause HTN

On other hand another factors can decrease BP-

high -K- Ca- and Mg -intake - wt. loss-

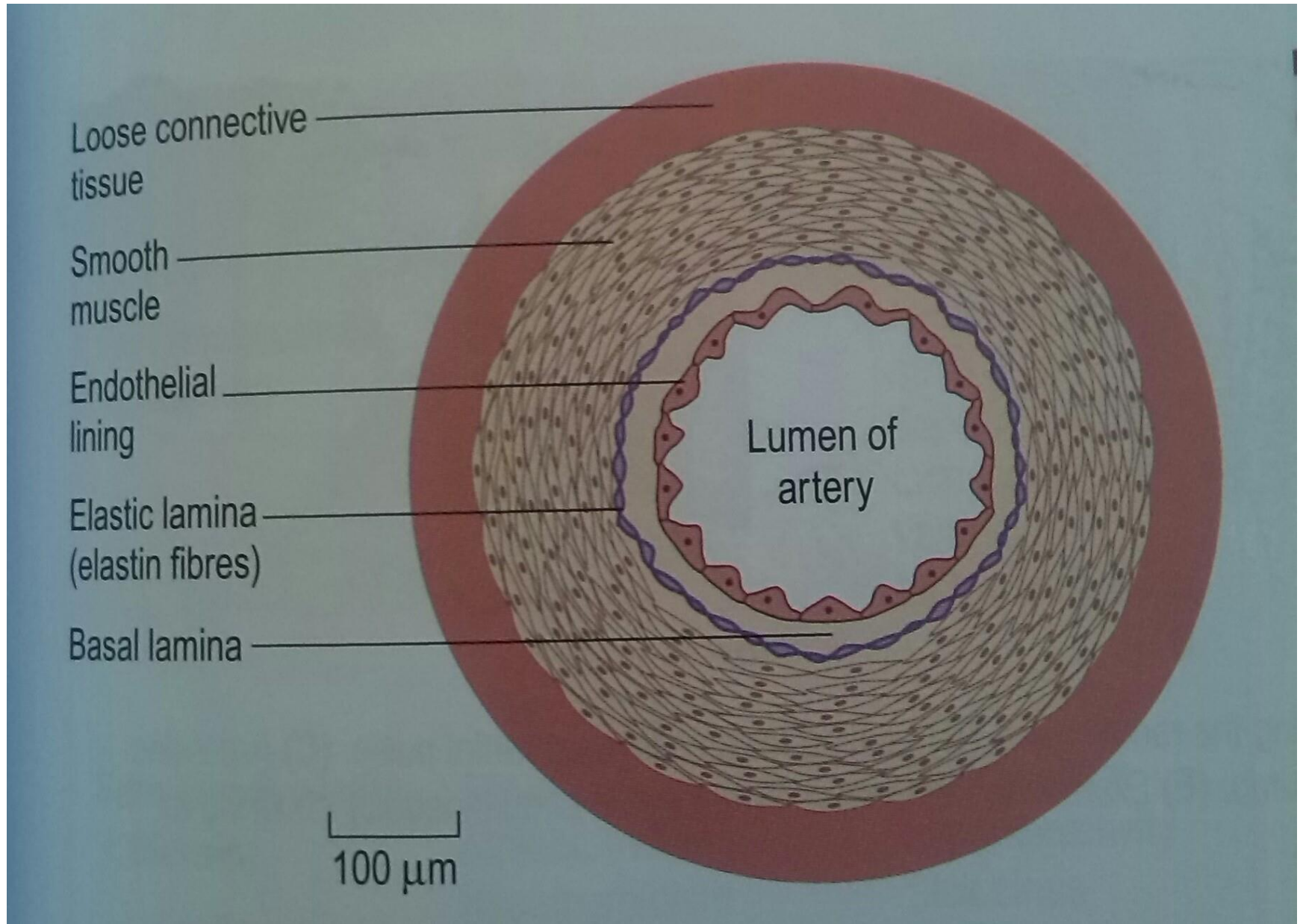
Fresh fruits-Vegetables – Regular Aerobic Exercise

No alcohol drinking or Smoking – good sleep .

# AETIOLOGY-



# PATHO-GENESIS OF ESSENCIAL HPN-



# PATHO-GENESIS OF ESSENCIAL HPN-

- Resistance small arteriols <1mm diameter.
  - Vascular Intimal layer proliferation
  - Muscular layer wall Thickening.
  - Reduced vascular lumen diameter.
  - Secondary Calcium and Hyaline deposition .
  - Ending in vascular- ATHEROMA- atherosclerosis.
- Increased peripheral vascular resistance
- Tissues hypo-perfusion and tissues ischemia.
- Arteriolar wall micro- aneurysm formation.

# PATHO-GENESIS OF ESSENCIAL HTN-

- Larger arteriols >1mm diameter-  
Thickened internal elastic lamina.
- Smooth muscles wall hypertrophy .
- Collagen- fibrous tissues formation- Fibrosis.
- Arterial wall calcification.  
ONION - SKIN appearance.  
Blood vessels becomes dilated tortuous  
With loss of wall compliance.

ATHEROSCLEROSIS - IHD - MI - LVH- HF- CVD-PVD- CKD.

HTN more and more sever.

# SECONDARY HTN-

- 5% of HTN- UNDERLYING secondary Aetiology
- 1- High Alcohol intake-  
Obesity- DM- SLEEP APNEA SYN.
- Pregnancy- Pre-eclampsia- Eclampsia.
- DRUGS-
- ORAL CONTRA-CEPTIVE PILLS-
- CORTICOSTEROIDS - NSAIDS- CICLOSPORINE
- CABINOXOLONE - LICURICE INTAKE.
- 2- RENAL DISEASE.
- A- RENAL-VASCLAR DISEASES
- RENAL ARTERY STENOSIS - UNI- BILATERAL

# SECONDARY HTN-

- B- RENAL PARENCHYMAL DISEASE-
  - Chronic –GN – Small size shrinked kidneys
  - Chronic -TIN- Reflux Nephropathy
  - POLYCYSTIC KIDNEYS DISEASES
  - DIABETIC NEPHROPATHY-
  - LIDDLES SYN.
- 3- ENDOCRINE DISEASES.
  - CUSHING SY. ACROMEGALY-
  - HYPER- PARATHYROIDISM-
  - HYPER- and HYPOTHYROIDISM.



# SECONDARY HPN-

## 4- ADRENAL CAUSES

- CONNS SYN.- HYPERALDOSTERONISM
- CONGENITAL ADRENAL HYPERPLASIA  
PHAEOCHROMOCYTOMA

## 5- CO-ARCTATION OF AORTA

## 6- VASCULITIS-

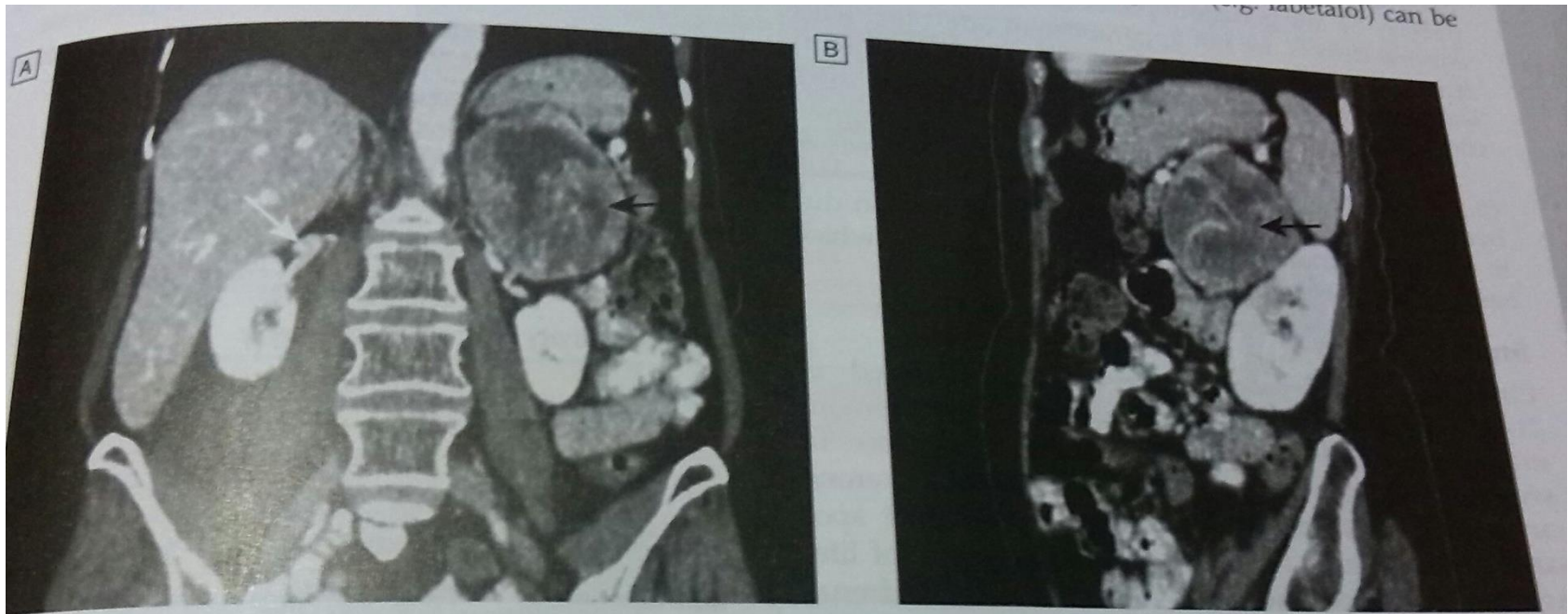
GN- RENO-VASCULAR-

TAKAYASU ARTERITIS- SCLERODERMA

# Polycystic -kidney

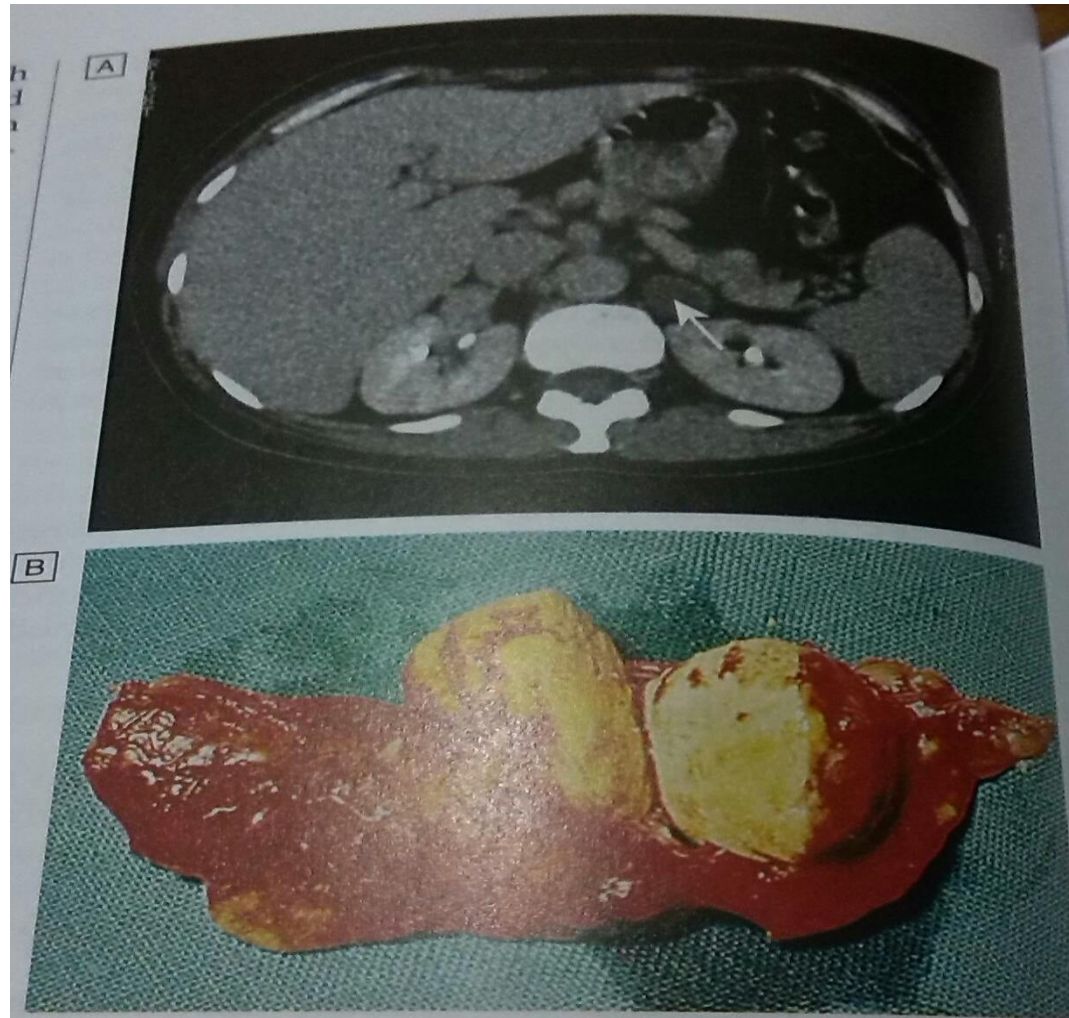


# PHAEOCHROMOCYTOMA



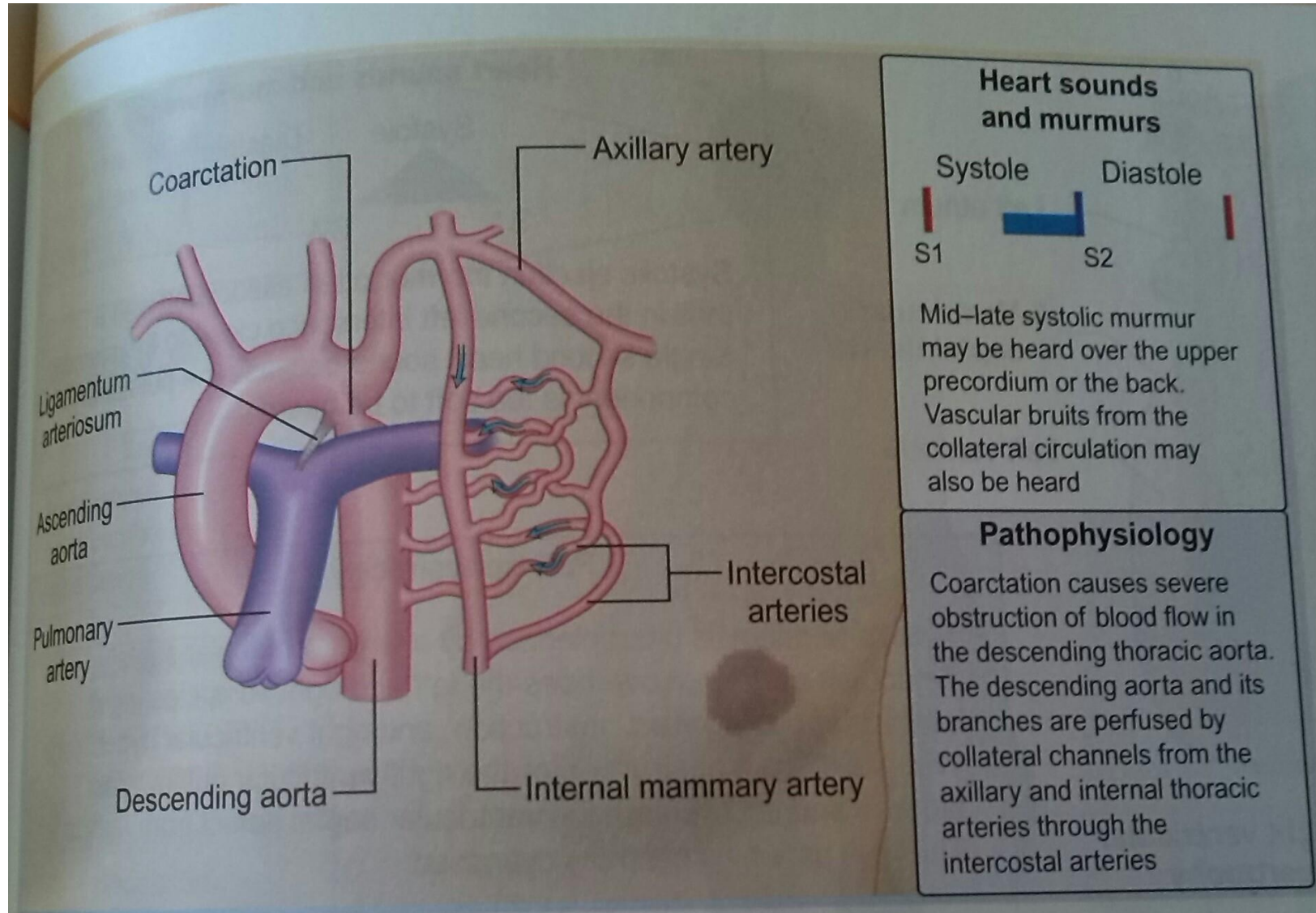
CT scan of abdomen showing large left adrenal phaeochromocytoma. **A** Coronal view. **B** Sagittal view. The normal right adrenal contrasts with the large heterogeneous phaeochromocytoma arising from the left adrenal gland (black arrows).

# CONN S SYNDROME

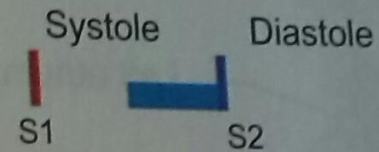


**20.23 Aldosterone-producing adenoma causing Conn's syndrome.** **A** CT scan of left adrenal adenoma (arrow). **B** The tumour is 'yellow' because of intracellular lipid accumulation.

# CO-ARCTATION-OF -AORTA



## Heart sounds and murmurs

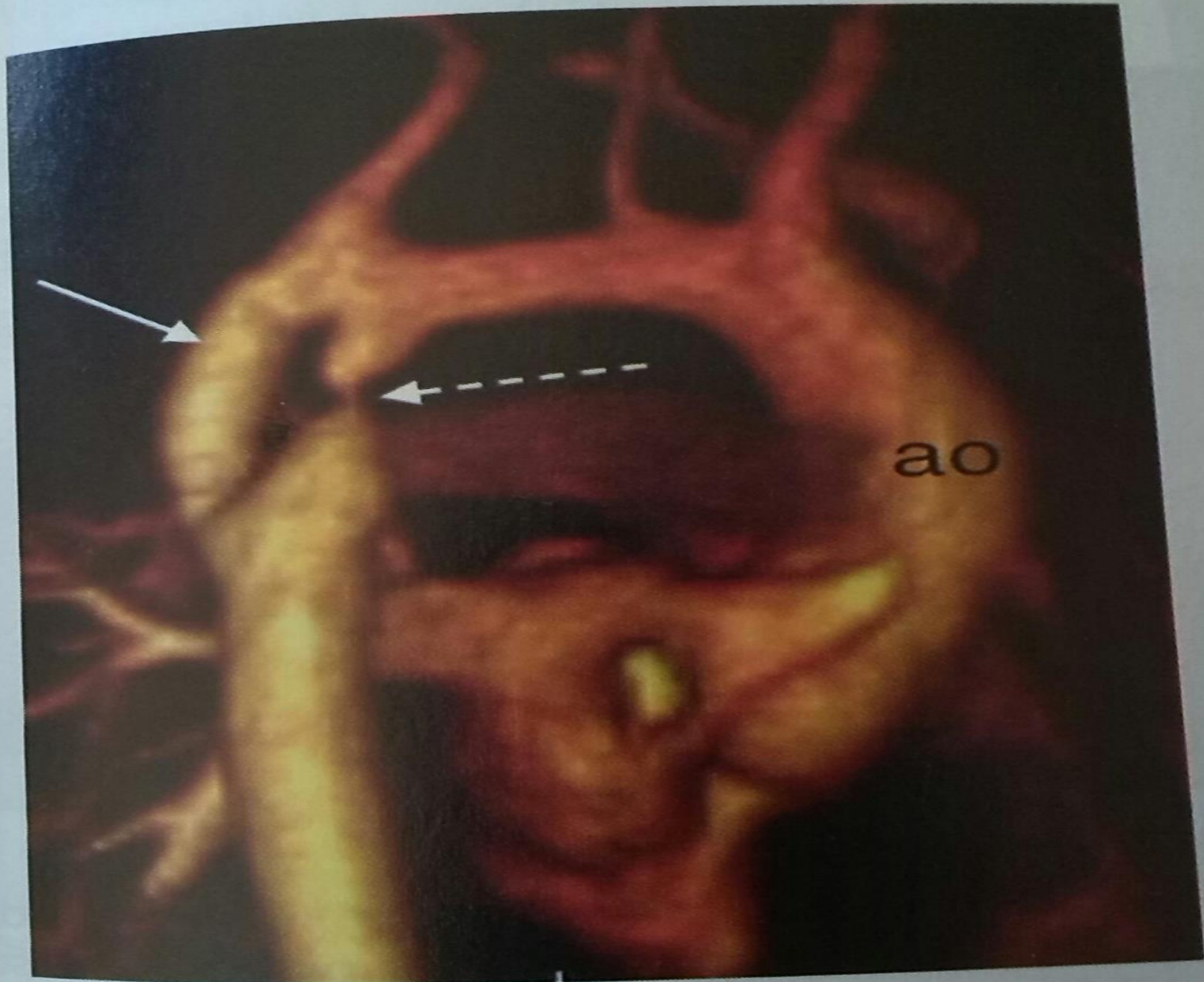


Mid-late systolic murmur may be heard over the upper precordium or the back. Vascular bruits from the collateral circulation may also be heard

## Pathophysiology

Coarctation causes severe obstruction of blood flow in the descending thoracic aorta. The descending aorta and its branches are perfused by collateral channels from the axillary and internal thoracic arteries through the intercostal arteries

# CO-ARCTATION-OF -AORTA



# KIDNEY AND HTN-

- HTN-
  - may be the cause or the result of renal diseases.
- Difficult to differentiate between them .
- Renal mechanisms causing HTN-
  - 1- Activation of Renin- Angiotensin- Aldosterone- sys.
  - 2- Inability of the kidneys to excrete the Excess Of Na from the body.
    - to maintain normal Na- balance
    - and intravascular volume.

# KIDNEY AND HPN-

## 3- Reno- Vascular disease- ISCHAEMIA

- UNI- LATERAL
- BILATERAL Renal Artery diseases.

A- Fibro-Muscular dysplasia

Renal Artery Stenosis- CONGENITAL

More common in young female < 40years old.

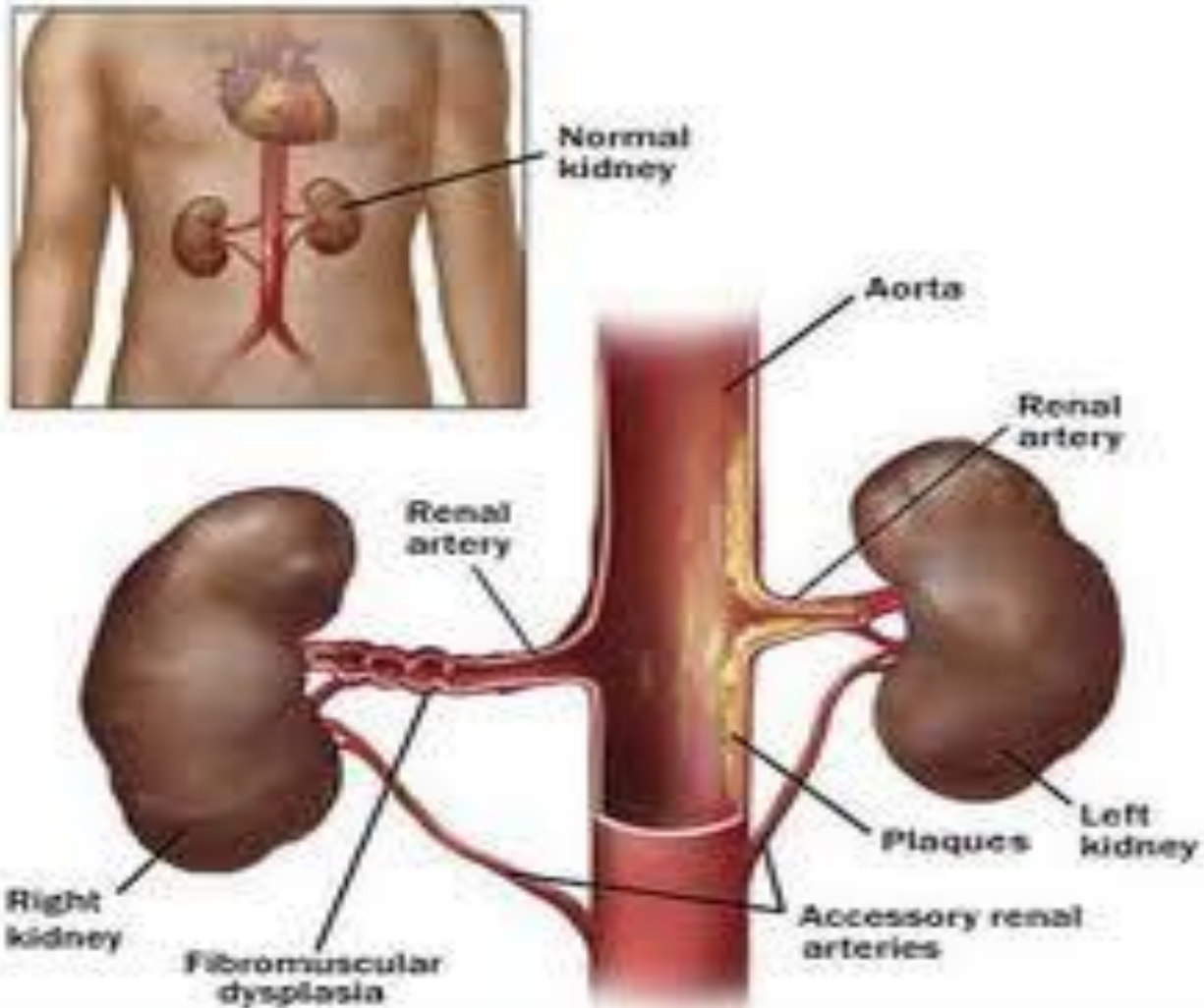
- RENAL - DUPLEX DOPPLER- U/S
- MRA- CTA- shows - STRING OF BEADS- like  
with multiple little aneurysmal dilations .



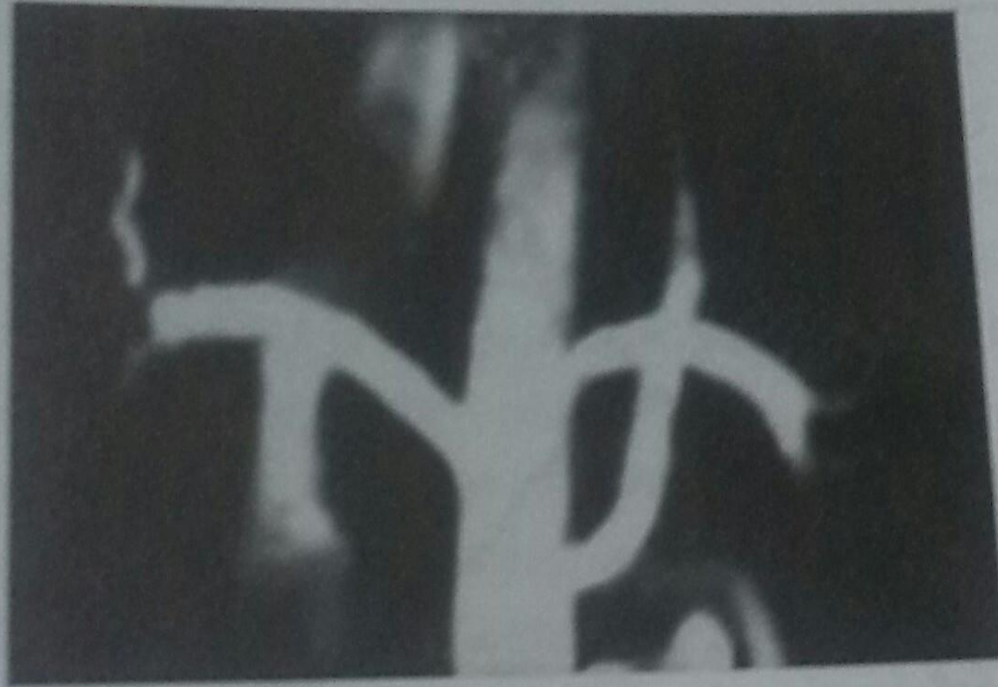
# KIDNEY AND HTN-

- B- Atherosclerotic – BI-LAT. RENAL ARTERY STENOSIS
  - Age related disease affecting men
  - > 50years old associated with
  - Wide-spread- Atherosclerosis-
  - Incidence- rises from 5% < 60years
  - >16% > 60years old.
  - Ostial lesion within 1 cm of renal artery origin.
  - Reduced kidney size > 1 cm difference
  - in kidney size unilateral or bilateral
  - Asymmetrical kidney size
- C- VASCULITIS -SCLERODERMA- TAKAYASU ARTERITIS.
-

# RENAL-ARTERY-STENOSIS



# KIDNEY AND HTN-



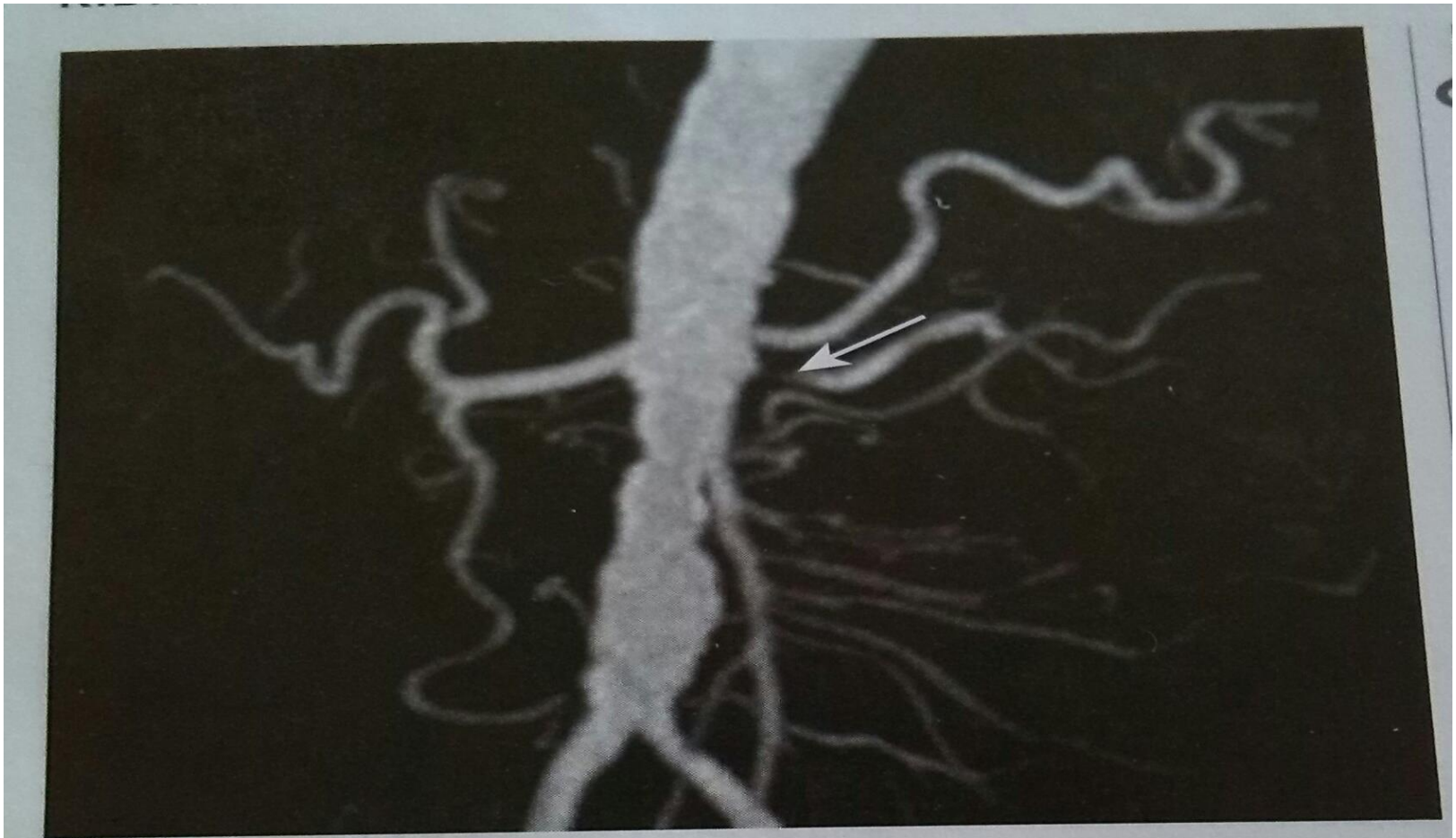
**Figure 12.9** Magnetic resonance angiogram of normal renal arteries.

# RENAL ARTERY-STENOSIS



**Figure 14.118** Digital subtraction angiography, showing typical unilateral atheromatous renal artery stenosis with post-stenotic dilatation (arrow).

# RENAL ARTERY-STENOSIS



**Fig. 17.23 Renal artery stenosis.** A magnetic resonance angiogram following injection of contrast. The abdominal aorta is severely irregular and atheromatous. The left renal artery is stenosed (arrow).

# RENAL ARTERY DISEASE –should be suspected in the following conditions-

- 1- Sever uncontrolled HTN.
- 2- Asymmetrical kidney size by U/S > 1cm difference.
- 3- Recurrent attacks of acute pulmonary edema .
- 4- Deterioration of renal function after ACEI or ARBS.
- 5- Peripheral vascular disease- PVD.  
diffuse atherosclerosis - Carotid artery bruits.
- Abdominal bruits or aortic aneurysm.
- 6- Progressive CKD.
- 7- Hypokalemia.

# RISK-FACTORS for an adverse prognosis in HTN-

- 1- BLACK- AFRICAN
- 2- Male sex.
- 3- Persistent high diastolic BP>115mmHg.
- 4- Smoking- high alcohol- intake.
- 5- DM and Dyslipidaemia.
- 6- Evidence of end organ damage-
  - LVH- IHD -CHF- CVA- Retinopathy
  - Renal function impairment - CKD.

# REFRACTORY- RESISTANT-HTN

1- Failure of medical treatment

## RESISTANT HTN

Patients on 3 antihypertensive medication including diuretic still his BP- >130/85

or on 4 antihypertensive drugs and his BP- < 130/85

PSEUDO-RESISTANT-HTN – uncooperative pat.

REFRACTORY HTN-all medications and still high BP.

Failure to diagnose SECONDARY underlying causes-

- Renal artery stenosis
- Pheochromocytoma – CONNS SYN.
- SLEEP APNEA SYN.
-



# HTN- ELDERLY-

- More than 50% of people > 60y. are HTN
- HPT- Age related disease. LOW RENIN HTN
  - Isolated Systolic HPN is common- Atherosclerosis.
- They are high risk group patients for
- Stroke - IHD- MI- HF-CKD- Peripheral vascular disease.
- DRUG of choice
  - Hydrochlorthiazide diuretics + Calcium channel blockers
- AGE > 80 years- BP- TARGET -140/90 - Consider CO- Morbidity.
- SYMPATHETIC OVER DRIVE-HTN- IN YOUNG-
- SYMPATHETIC STIMULATION - SMOKER- YOUNG <50Y
- VASOCONSTRICTION- HIGH RENIN-
- TACHYCARDIA- resting HR>80 -p/min. diastolic HTN-
- TREATMENT- B- BLOCKER- CENTRALLY ACTING DRUGS-MOXOIDINE.

# HYPERTENSION IN PREGNANCY



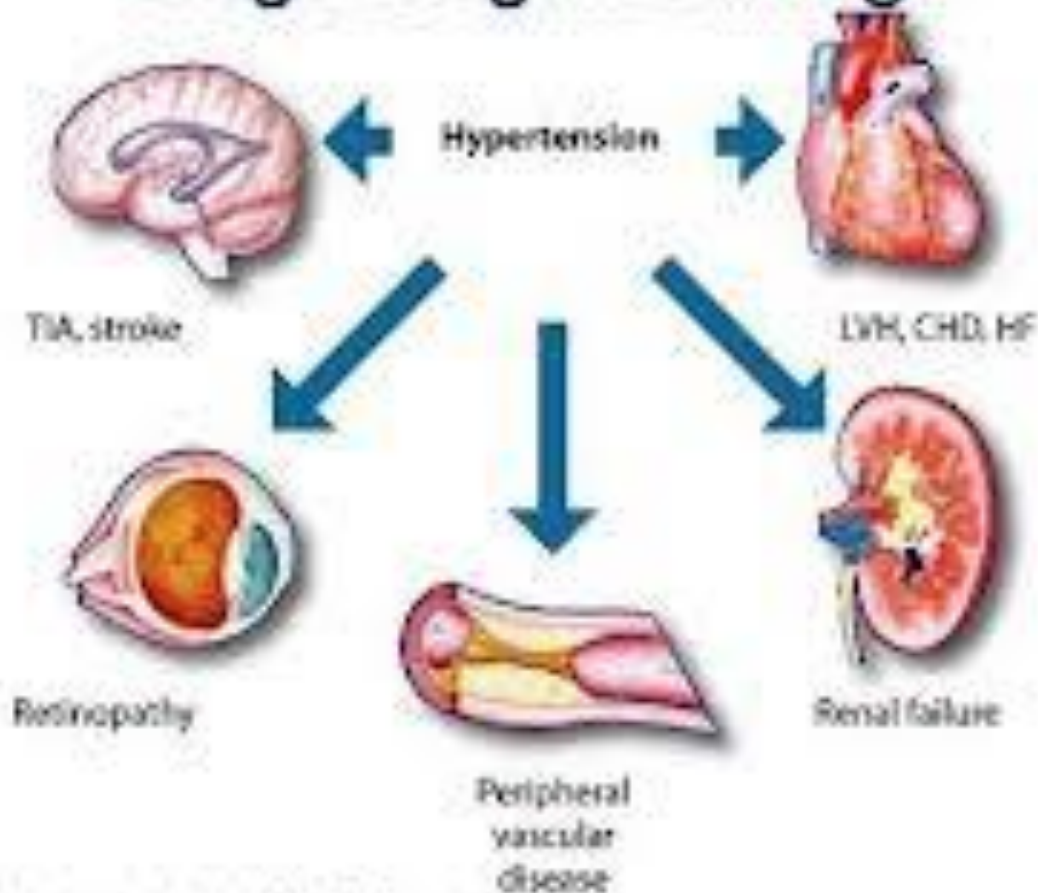
# HYPERTENSION IN PREGNANCY

## BP-<120/80

- 1- Chronic -HTN- pre-existing before 20 weeks of gestation.
  - 2- Gestational HTN-is BP >140/90 in 2<sup>nd</sup> trimester  
in previously Normotensive women NO proteinuria.
  - 3- Pre-Eclampsia -HTN-after 20 weeks of gestation+ proteinuria.
  - 4- Eclampsia- HTN + grand mal seizures  
leg edema- proteinuria >300mg/24hours .
  - 5- HELLP syndrome – sever pre-eclampsia +  
Hemolytic anemia - Elevated liver enzymes- Low plat.
- ACEI- ARABs – TERATOGENIC- CONTRA-INDICATED.
- First line           Methyldopa.
- Second line-       Nifedipine - Labetalol- metaprolol-THIAZIDE.






# Target organ damage in hypertension

## Complications of Hypertension: Target-Organ Damage

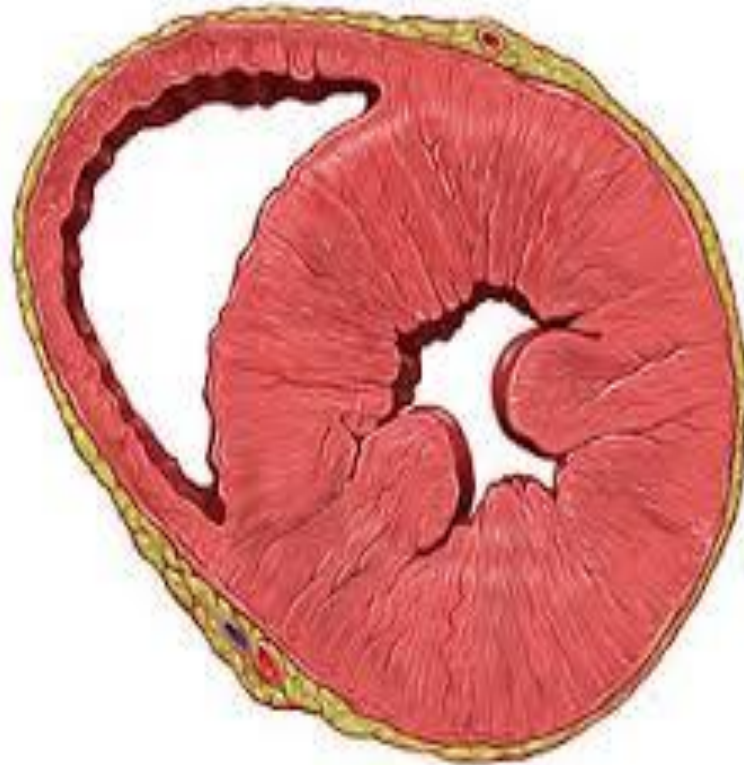


TIA, transient ischemic attack; LVH, left ventricular hypertrophy; CHD, coronary heart disease; HF, heart failure

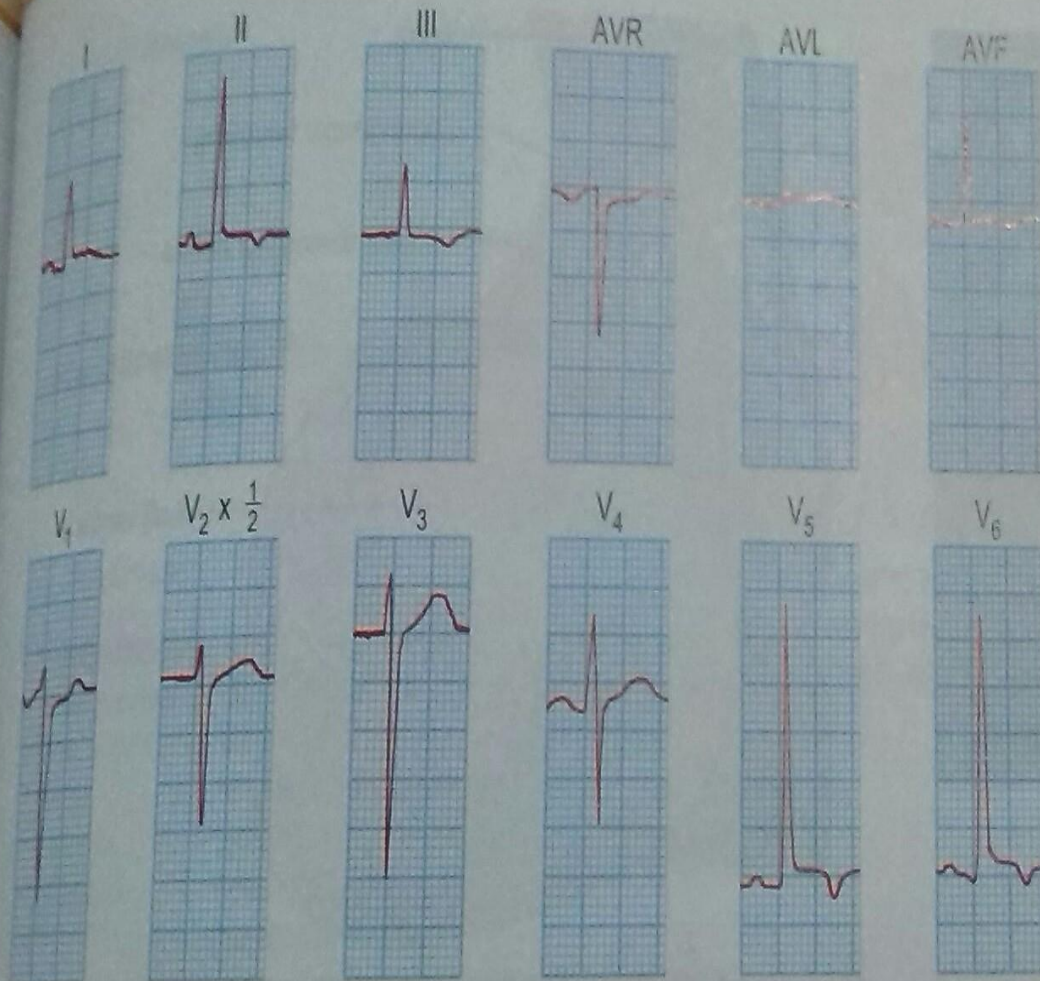
# Target organ damage in hypertension

Organ	Problem	Outcome
	Atherosclerosis Aneurysms Aortic dissections	
	Haematuria Uraemia Proteinemia	Chronic kidney disease
	Pulmonary oedema Myocardial infarction Left ventricular hypertrophy	Cardiac failure
	Haemorrhage / infarction Seizures Vascular dementia	Stroke / TIA
	Haemorrhages Exudates A-V nipping Papilloedema	Blindness

# LVH-HTN

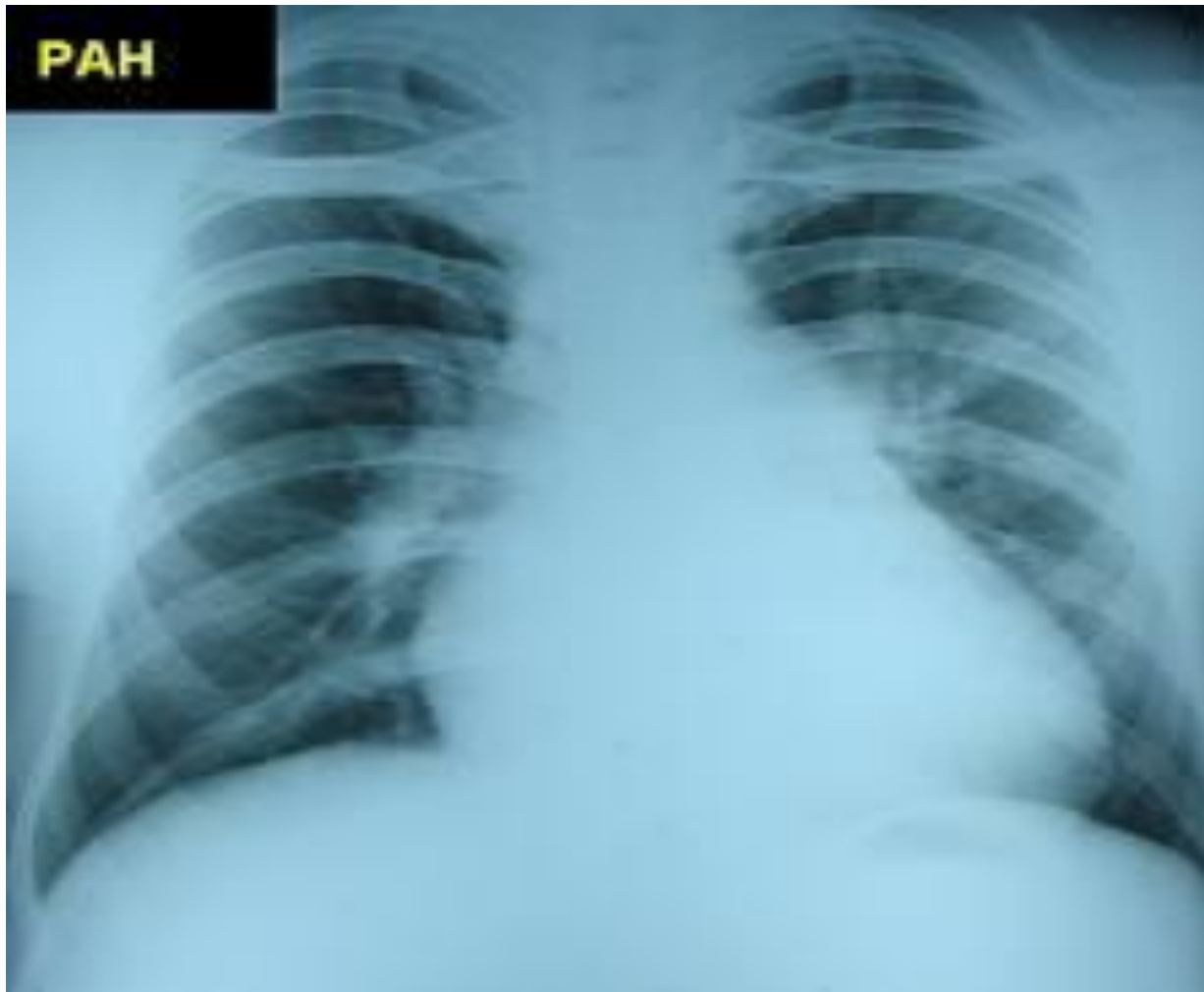


# LVH-HTN



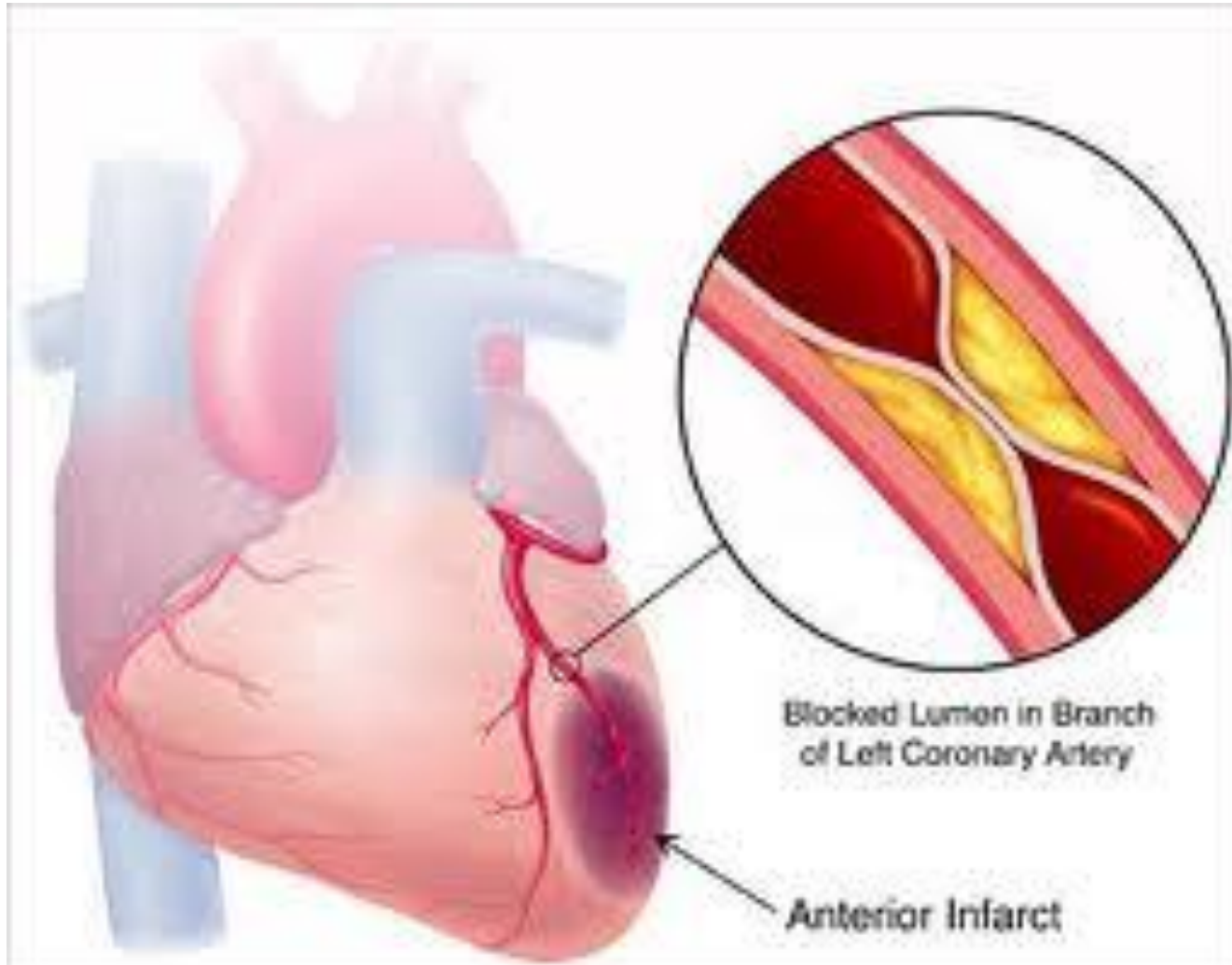
**Figure 14.76** Left ventricular hypertrophy shown in a 12-lead ECG. Note the size of the S wave seen in V<sub>1</sub> (21 mm); S in V<sub>1</sub> + R in V<sub>6</sub> = >35 mm.

# LVH-HTN

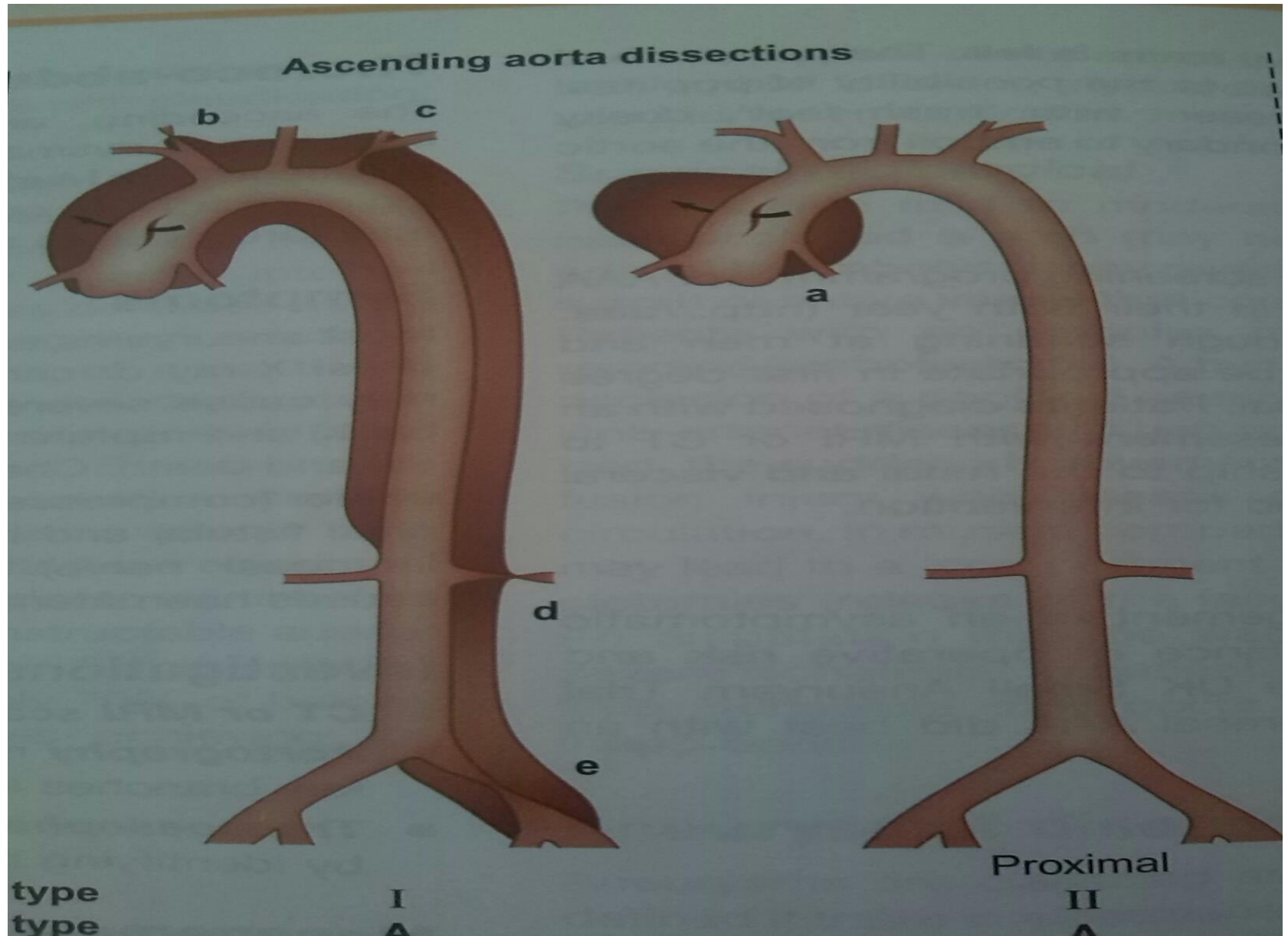




# IHD-ACUTE-MI-HTN

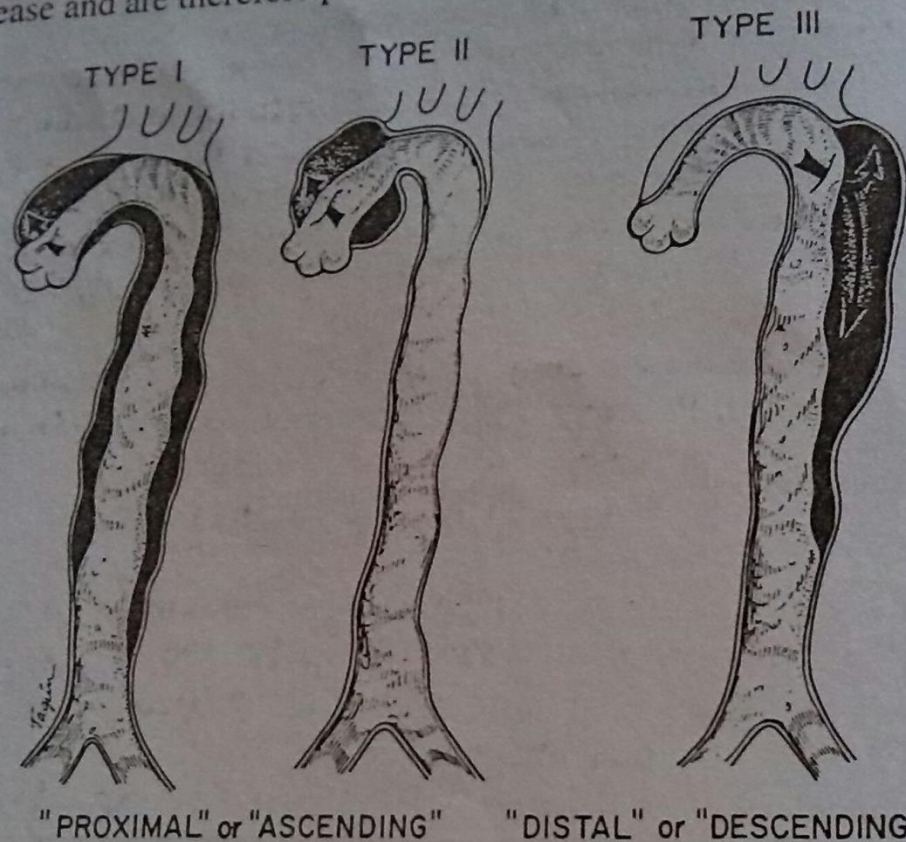


# MALIGNANT- HTN



# EMERGENCY-MALIGNANT- HTN AORTIC-DISSECTING ANEURYSM

diopulmonary disease and are therefore p

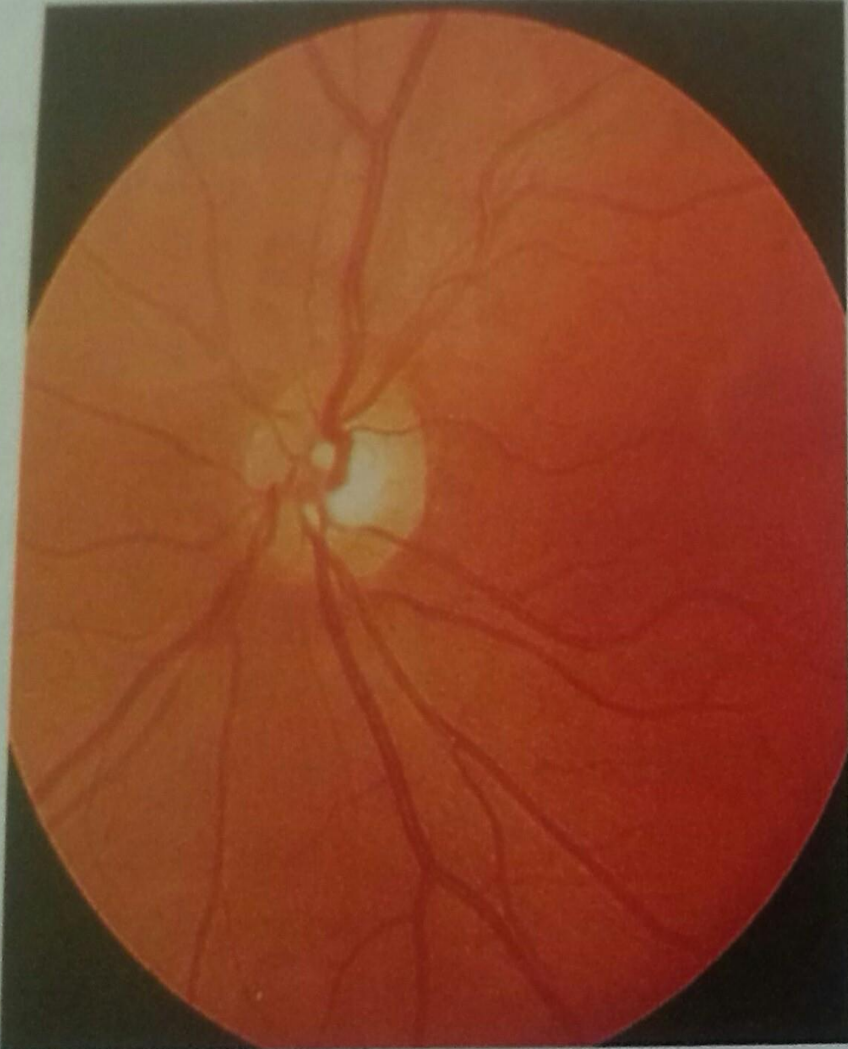


From Braunwald E (ed): Heart Disease: A Textbook of Cardiovascular Medicine, 3rd ed. Philadelphia, W.B. Saunders, 1988, p 1554; with permission.

# Hypertensive retinopathy

- Grade 1           Arteriolar thickening, tortuosity and increased reflectiveness (“silver wiring”).
- Grade 2           Grade 1 plus constriction of veins at arterial crossings (“arteriovenous nipping”).
- Grade 3           Grade 2 plus evidence of retinal ischaemia (flame – shaped or bolt haemorrhages and “cotton wool “ exudates).
- Grade 4           Grade 3 plus papilloedema.

# HTN-RETINOPATHY



A



B

# HTN-RETINOPATHY



Figure 14.117 Fundus showing hypertensive changes: Grade 4 retinopathy with papilloedema, haemorrhages and exudates.

# HTN-RETINOPATHY PAPILLOEDEMA

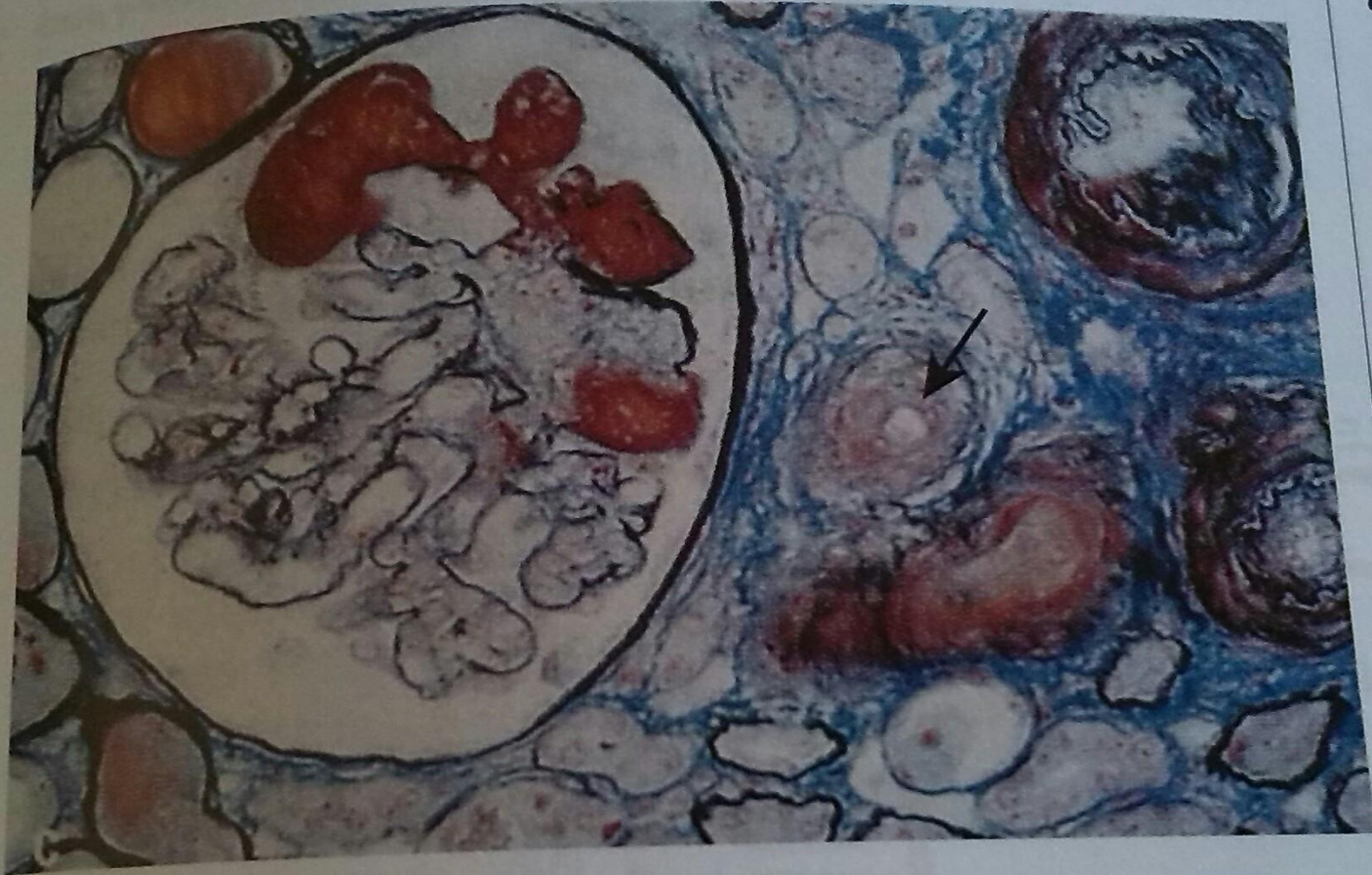


# EMERGENCY-MALIGNANT- HTN

- Constitutes >1% of HTN-
- ACUTE RAPID RISE BP-
- Accelerated Micro-vascular damage and occlusion.  
MULTI organs ISCHAEMIA - Heart- Kidney-Brain-Eyes.
- Splits in the intima of small blood vessels wall.
- Vascular wall Fibrinoid Necrosis.  
Intra-vascular fibrin deposition and thrombosis.  
Micro- Angiopathic Haemolytic Anaemia-  
THROMBOTIC MICRO-ANGIOPATHY  
RBC- fragmentation- Thrombocytopenia.



# EMERGENCY-MALIGNANT- HTN



**Fig. 17.24** Glomerular capillary thrombosis in malignant hypertension. Similar changes occur in thrombotic microangiopathy. The adjacent arteriole (arrow) shows gross intimal thickening.

# EMERGENCY-MALIGNANT- HTN

- Clinically presented
- ACUTE-SEVER- HTN- diastolic BP>120-140mmHg,
- Progressive renal failure- AKI
- ACUTE Aortic- dissecting aneurysm-  
Acute pulmonary odema.
- Encephalopathy- SEVER HTN- Cerebral odema
- brain hemorrhage -convulsion.
- PAPILLEDEMA- almost always present.
- COMA- Death.

# EMERGENCY-MALIGNANT- HTN

- MANAGEMENT-

- 1- HOSP. ADMISSION- ICU

- 2- Slowly reduce BP-

- To avoid cerebral – renal- and cardiac ischemia because loss of autoregulation.

- TARGET- BP

- diastolic BP-100-110mmHg -Over 24- 48 h.

- Then control and normalize BP Over next 2-3days

- 3- IV- Na - Nitroprusside-

- Labetolol-

- Glycerin trinitrate - Hydralazine

# CLINICAL APPROACH-EXAM.HTN

- DIGNOSIS-PTN-
  - 1- Medical-History-

COMMONLY Asymptomatic- discovered by routine exam.

SYMPTOMES-

occipital headache - dizziness - vertigo- tinnitus-

TARGET ORGAN DAMAGE -IHD-MI-ARRHYTHMIA-HF-PVD-CKD.
  - Drug history- NSAID- Alcohol -STEROID-PILLS –LICURICE-DIET.
  - Family history- RENAL DISEASES-HTN-DM-LIPIDS PROBLEM.
- 2- Clinical physical examination-

GENERAL exam. VITAL SIGNS-

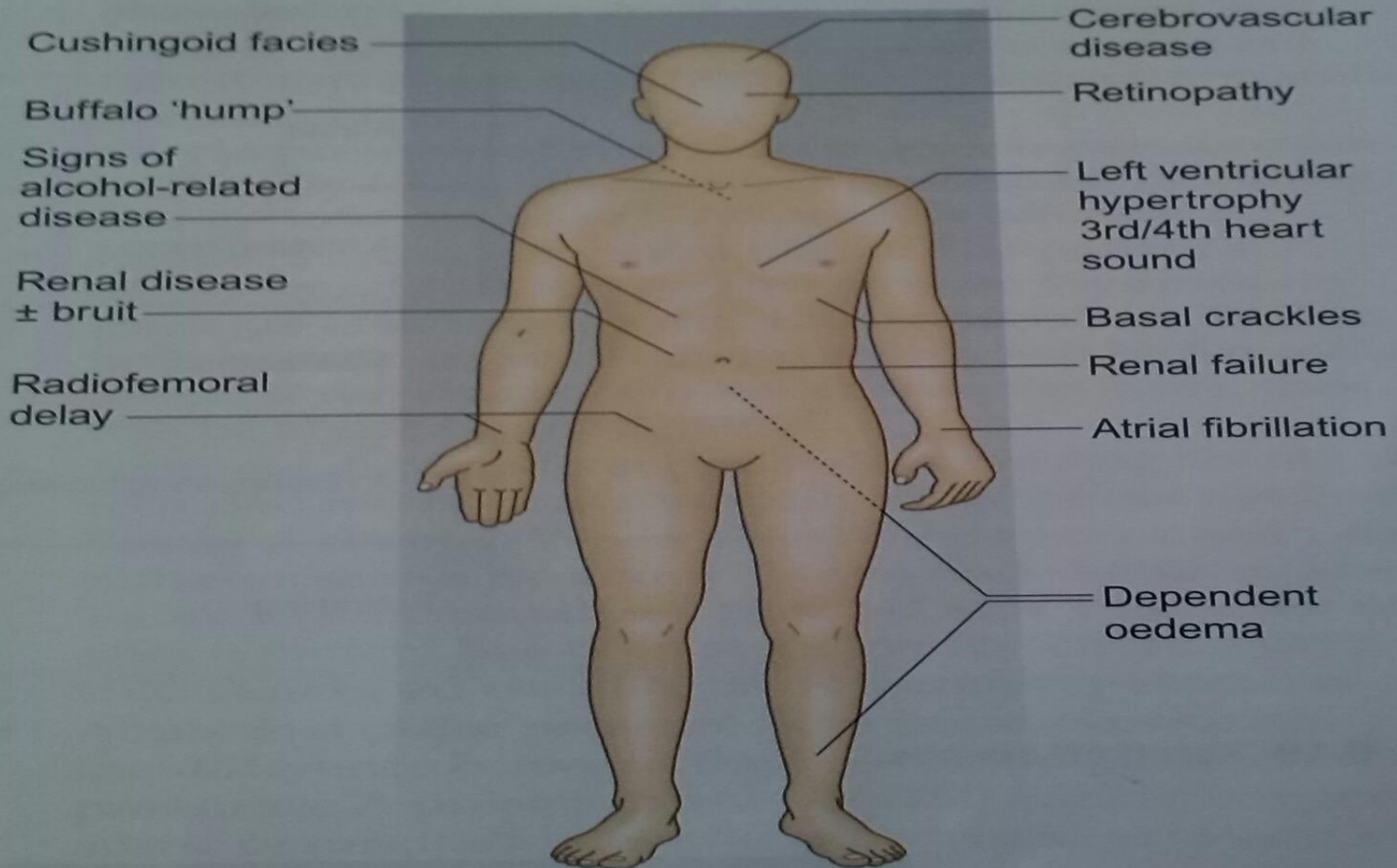
CARDIOVASCULAR system
- Looking for SECONDARY underlying causes.

Target end organs damage-CNS -EYES-RENAL.

# CLINICAL APPROCH-EXAM.HTN



# CLINICAL APPROCH-EXAM.HTN



**Fig. 6.18** Physical signs associated with hypertension.

# MANAGEMENT-THRESHOLDS OF HTN

## CLINICAL-APPROACH

- 1- BP -110/75-100/70- NO COMPLICATIONS-
- BP-130/85- RE-ASSESS IN 2-3- YEARS.
- 2- BP 130-139/85-89- RE-ASSESS – YEARLY-life style
- 3- BP 140-159/90-99-
- A- TARGET ORGAN DAMAGE OR
- CARDIOVASCULAR COMPLICATIONS - OR DM
- Confirm high BP- Then treat - 2-3-weeks.
- B- IF NOT MONTHLY BP-
- OBSERVE AND CHECK CARDIOVASCULAR SYS.
- –LIFE STYLE CHANGE -
- TREAT- IF BP- LEVEL ARE MAINTAINED HIGH.

# MANAGEMENT -THRESHOLDS OF HTN

## CLINICAL -APPROACH

- 4- BP-160/100-
- CONFIRM AND TREAT-
- WITH OR WITHOUT
- DM- CARDIOVASCULAR COMPLICATION
- OR END ORGAN DAMAGE-
- TREAT WITHIN 1-2 WEEKS
  
- 5- BP-180/110
- WORK UP IMMEDIATELY



# Lifestyle Modification

## PREVENTION OF HPN-

1- Body weight	Maintain normal body weight (BMI 20-25kg/m)
2-Aerobic exercise	>30 min brisk walk most days/week
3- Diet	Reduce intake of fat and saturated fat Reduce salt intake <6 g NaCl /day ,increase fish oil
4- Cardiovascular risk reduction	Avoid cigarette smoking –high alcohol

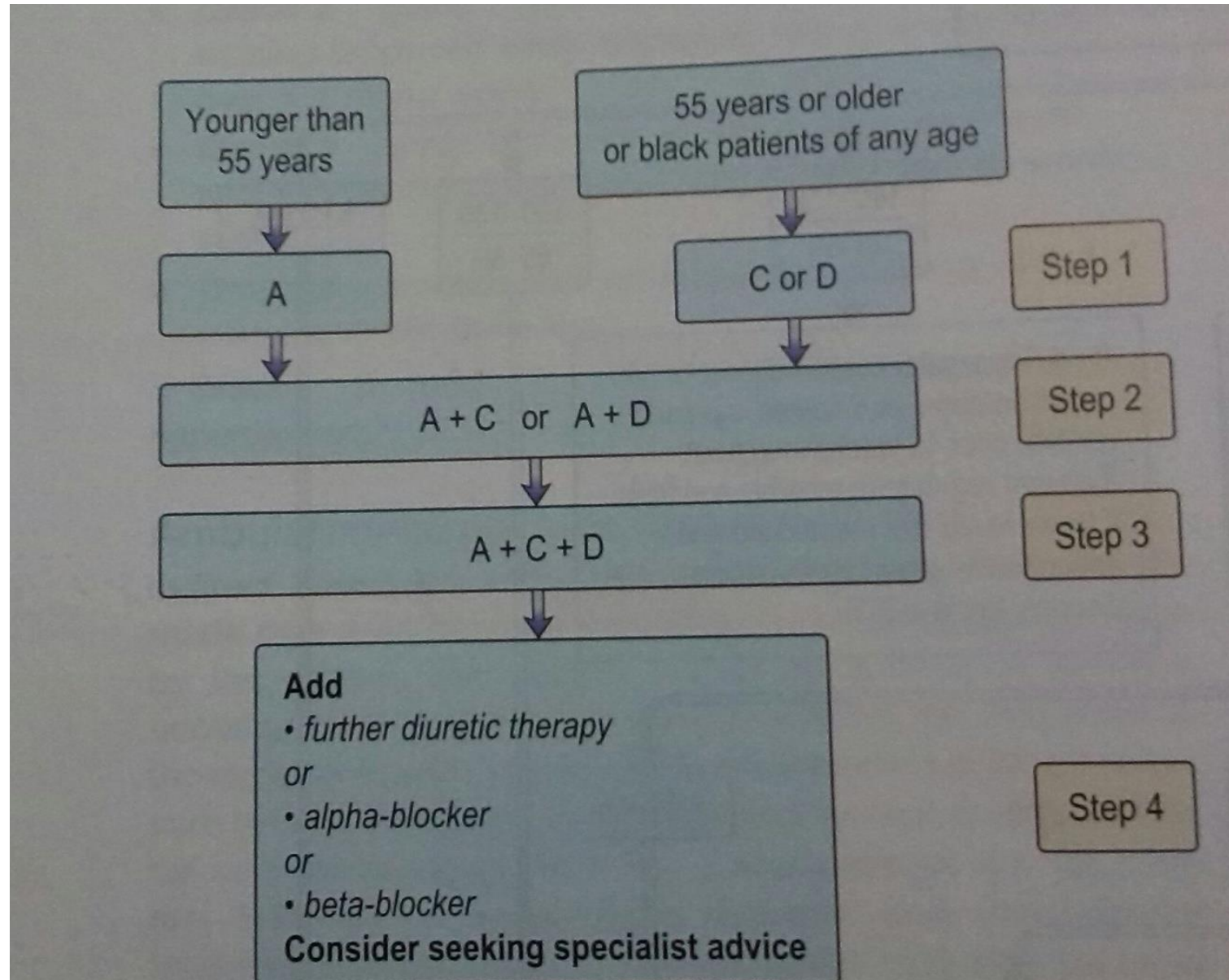
# Lifestyle Modification



# Lifestyle Modification



# MANGMENT-HTN



# ANTI-HYPERTENSIVE DRUGS

- Reduce cardiovascular events
  - 30% reduction - stroke- 20% IHD-
  - ROLE OF TEN- MULTIPHARMACY
- 1- ACEI- GROUP-
- ENALOPRIL- LISINOPRIL- RAMIPRIL- PERINDOPRIL
  - INDICATED – AFTER- ACUTE-MI- YOUNG -HF –
  - DMT2- NEPHROPATHY-CKD- GFR>30 - STROKE.
- 2- ARBs- GROUP-
- FOR – COPD-AFFRICAN ORIGIN-HF- ACEI-INTOLERANCE
- LOSARTAN- CANDESARTAN- VALSARTAN
  - OLMISARTAN- TELMISARTAN-
  - INDICATED-
  - -LVH- IHD- HF- DMT2- NEPHROPATHY-CKD- GRR>30.

# ANTI-HYPERTENSIVE DRUGS

- 3- THIAZIDES- HYDROCHLORTHIAZIDE LIKE-  
INDAPMIDE-CHLORTHALIDONE-  
OLD PT. SYSTOLIC HTN- HF- STROKE.
- 4- CALCIUM CHANNEL BLOCKERS GROUP- BEST  
COMBINATION WITH ARBS- TO AVOID LEG ODEMA
  - DIHYDROPYRIDE-GROUP
  - AMLODPINE - NIFEDIPINE-
  - NON-DIHYDROPYRIDINE-GROUP
  - - DILTAIZEM - VERAPAMIL-
  - Old pt. SYSTOLIC- HTN- ANGINA- ARRHYTHMIA
- 5- B-BLOCKERS GROUP –NOT REDUCING CENTRAL –BP-
  - ATENOLOL- BISOPROLOL-NEBIVOLOL
  - CARVIDOLOL METOPROLOL
  - HTN- HF- ANGINA- ARRHYTHMIA- AF

# ANTI-HYPERTENSIVE DRUGS

## 6- ALPHA-BLOCKER GROUP

- - PHENTOLAMINE-PHENOXYBENZAMINE
- DOXAZOSIN- HTN- BPH

## 7- ALPHA- B- BLOKERS-

- LABETOLOL- Pregnancy-Emergency-IV.

## 8- VASODILATORS- GROUP-

Hydralazine- Na- nitroprusside- GTN.

## 9- Centrally acting—MOXOIDINE-methyldopa

- Pregnancy – lactating-

## 10- STENT- RENAL ARTERY STENOSIS

## 11-SURGERY-ADRENAL MASS- CO-ARCTATION OF AORTA- RENAL DENERVATION.

- **Key points**
- Well CALBRATED -BP- MACHINE-measurement-BP- is important for diagnosing and managing hypertension.
- Management of hypertension begins with an accurate assessment of total risk of cardiovascular disease before complication.
- It is important to consider secondary hypertension.
- Changes in lifestyle may delay or avoid the need for drug treatment.
- You should offer patients in whom the clinic blood pressure is greater than 140/90mm Hg-
  - to confirm the diagnosis - (HBPM)BP<5mmHG and
  - ABPM-another <5mmHG .
    - You should start antihypertensive drug treatment in patients after confirmation and life style change.
    - BP>140-159/90-95 mm Hg WIH DM- OR HIGH RISK-
    - WITHOUT WAIT FEW MONTHS.
    - BP- >160/100 mmHg
    - WITH OR WITHOUT CARDIOVASCULAR COMPLICATIONS .
    - **or the** 10-year cardiovascular risk > 20%.



# SILENT KILLER

