SNS COLLEGE OF ALLIED HEALTH SCIENCE

Affiliated to The Tamil Nadu Dr. M.G.R Medical University, Chennai

DEPARTMENT OF CARDIAC TECHNOLOGY

COURSE NAME : CF & BLS

UNIT : HYPERTENSION

FACULTY NAME : Ms. HARSHITHA S

What is blood pressure?

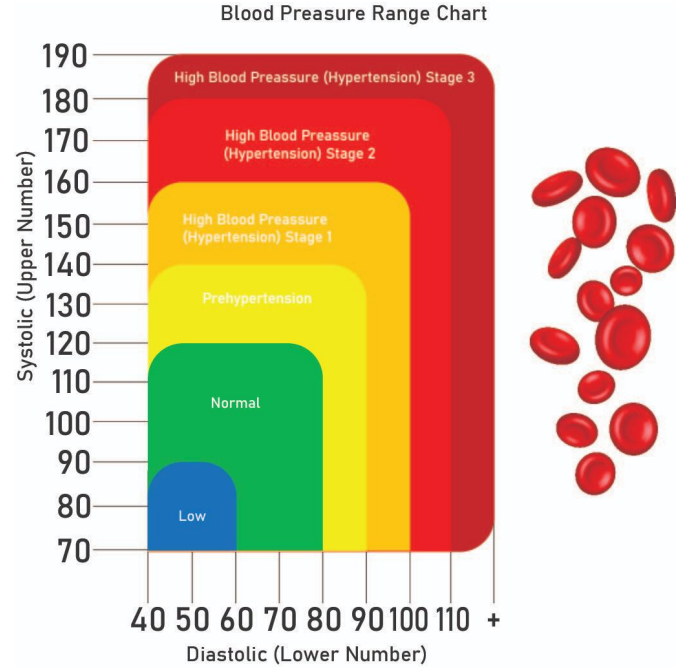
- ✓ Blood pressure is a force of the blood pushing against the wall of the blood vessels.
- ✓ Systolic blood pressure?

Pressure in arteries when the hear contract(120mmHg - 60kpa)

- ✓ Diastolic blood pressure?

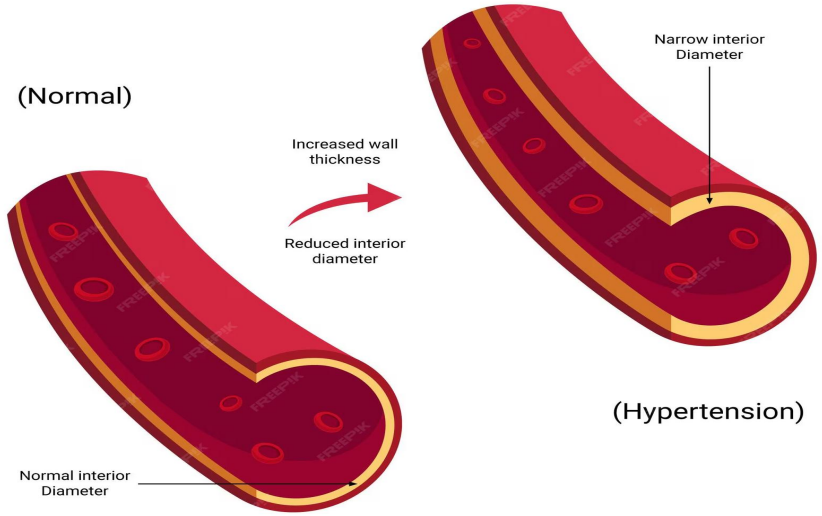
Pressure in arteries when the heart relax(80mmHg)

- ✓ **Normal bp =120/80mmHg**



Hypertension - Definition & Classification

- ✓ It is a condition in which the force of the blood against the artery wall is too high.
- ✓ Usually, the systolic BP is >120mmHg and diastolic Bp is >100mmHg.
- ✓ Types of Hypertension
  - primary hypertension
  - secondary hypertension



Primary hypertension

- ✓ Primary hypertension counts 90 - 95% of total hypertension cases.
- ✓ also known as essential hypertension.
- ✓ Usually when there is hypertension the causes is unknown anyway's there are certain factors that may lead to primary hypertension:

- Genetic/family history
- Inactive lifestyle
- Unhealthy lifestyle habits
- Age

Secondary hypertension

- ✓ It counts about 5% of total hypertensive cases.
- ✓ In secondary hypertension causes is identified.
- ✓ Certain causes may be due to,
- Narrowing of arteries that supplied to the kidney
- Renal parenchymal disease
- Adrenal gland disease
- Constriction of aorta
- Due to certain medications

(eg: oral contraceptive pills, observative sleep apnea)

Pathophysiology

Due to etiological factor

↓

Changes in arteriolar bed, increased systemic vascular resistance

↓

Increased heart rate Increased cardiac output

↓

Increased Blood pressure and Decreased blood flow to organs

↓

Blood pressure is also influenced by RAAS complex kidney's juxtaglomerular cells are affected

↓

Renin Forms

↓

Angiotensinogen

↓

Angiotensin 1

↓

Angiotensin II

↓

[Angiotensin II leads to] 1.Vasoconstriction

↓

2.increases aldosterone secretion

↓

3.increases sodium and water retention

↓

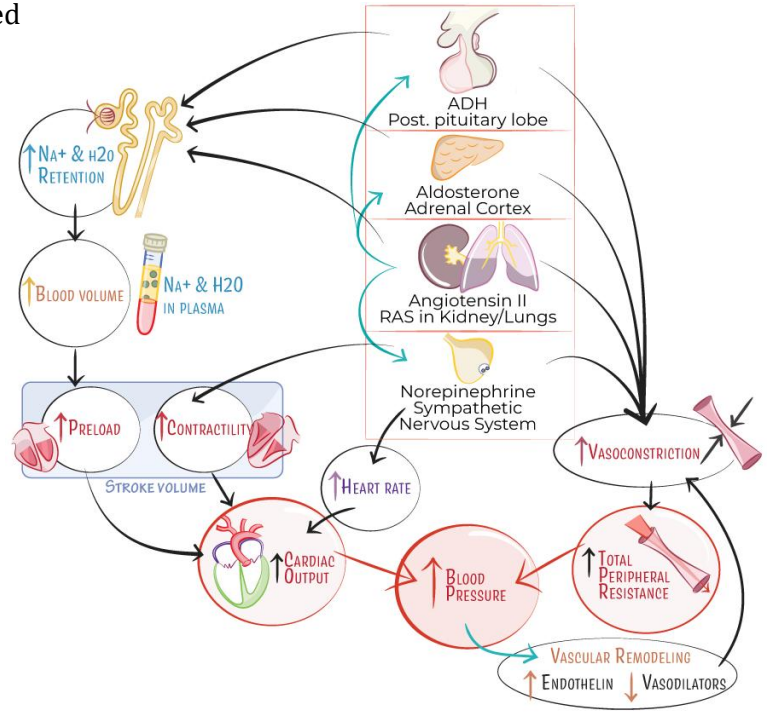
4.increases blood volume

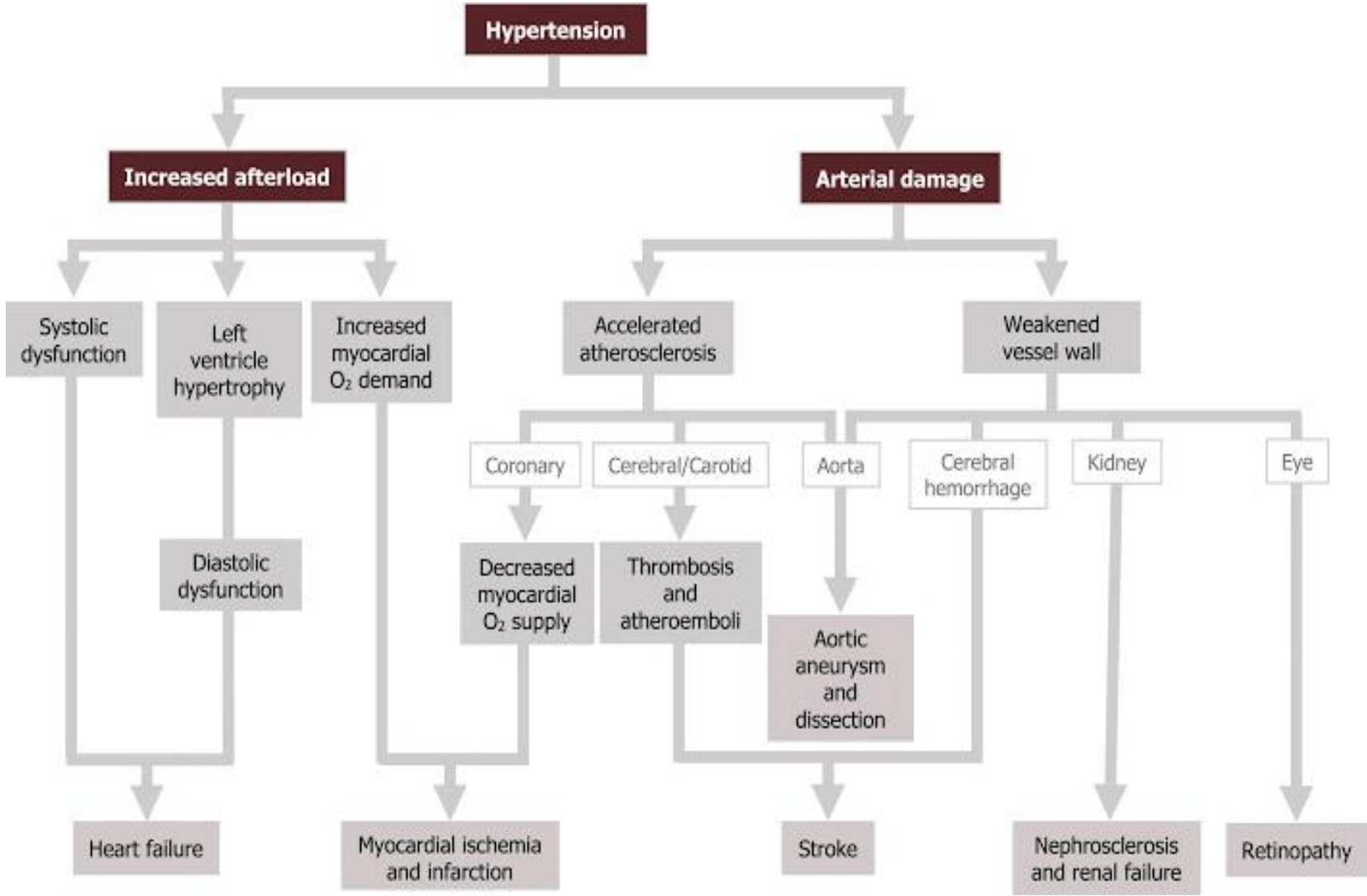
↓

5.increases peripheral resistance

↓

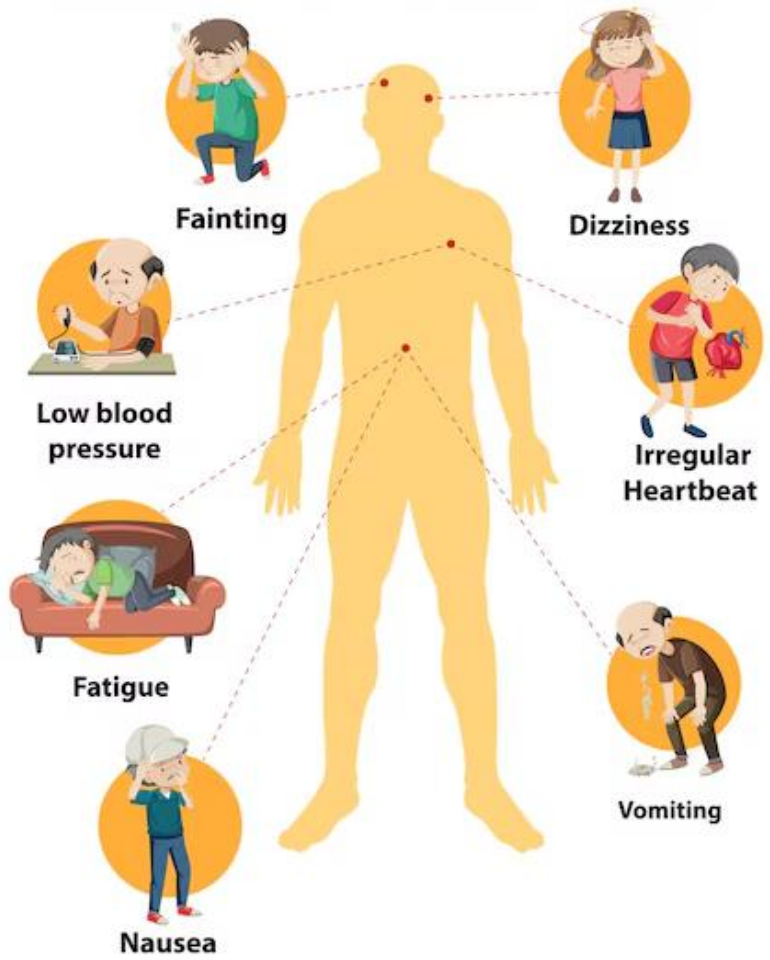
As a result of all of these physiological changes, Blood pressure occur




Hypertension
Increased afterload
Arterial damage
Systolic dysfunction
Left ventricle hypertrophy
Increased myocardial O_2 demand
Accelerated atherosclerosis
Weakened vessel wall
Coronary
Cerebral/Carotid
Aorta
Cerebral hemorrhage
Kidney
Eye
Diastolic dysfunction
Decreased myocardial O_2 supply
Thrombosis and atheroemboli
Aortic aneurysm and dissection
Heart failure
Myocardial ischemia and infarction
Stroke
Nephrosclerosis and renal failure
Retinopathy

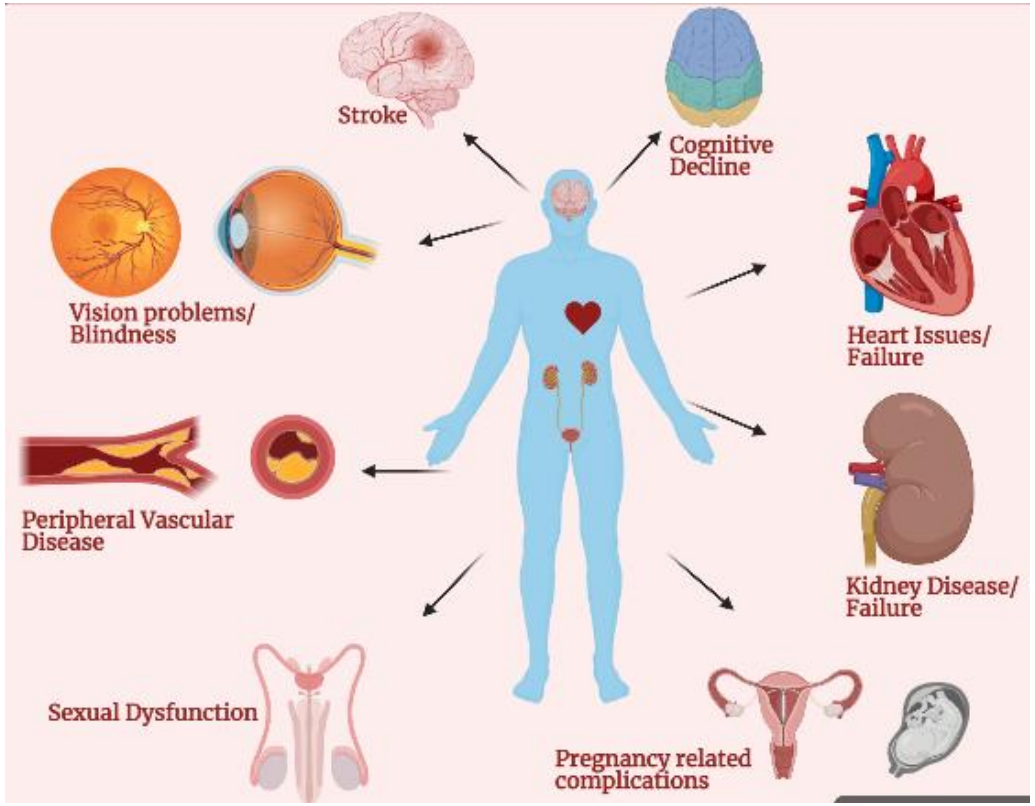
Clinical manifestations

- Severe head ache
- Dizziness & Blurred Vision
- Nausea & vomiting
- Fatigue & confusion
- Epistasis
- Chest pain & shortness of breath
- Irregular heart rate
- Ear noise
- Edema



Complications

- Heart failure
- Stroke
- Neuropathy
- Nephropathy
- Retinopathy
- Outpouching of aorta
- LVH



Diagnosis

Medical History –

- Where the patient will be asked Part & genetic history of the underlying disease.

Physical examination –

- Patient will be checked for the pulses Retina, edema

Blood test –

- CBC, Sodium and potassium:- in hypertensive cases electrolyte Imbalance is common
- Fasting glucose: To verify diabetes
- Lipoprotein: To check for lipid content

Diagnosis

- Creatine: To verify the kidney process
- BUN: Blood urea nitrogen
- Urine analysis:- 24 hours urine protein test
- ECG: Increased R-wave progression
- Symbolising LVH
- ECHO:

To check for LVH

- Examination of the retina and check for Ocular pressure

Medical management

(1) Diuretics:

- It is used to treat fluid accumulation
- Furosemide (40-240 mg/day)
- Spironolactone (25-100 mg/day)

(2) Beta blockers:

- It reduces workload of heart opens the blood vessels so that the heart can beat lower and with less force
- propranolol (40-480 mg/day)
- Atenolol (25-100 mg/day)

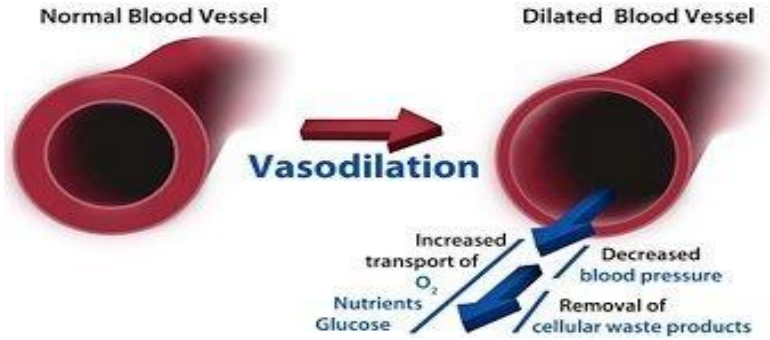
Medical management

3) Alpha blockers:

- Reduces the nerve Impulses to the blood vessels, Reduces the natural chemical that narrow the blood vessels
- Terazocine (1-20 mg/day

4) Alpha & Betablockers - Labetalol (2-30 mg/day(most commonly used)

5) Vasodilators - Nitroglycerine



Medical management

6) ACE Inhibitors

- Captopril (25-150 mg/day)
- Remipril (1.25-20 mg/day)

7) Angiotensin II Receptor blockers - Losartan

8) Renin Inhibitors

9) Calcium channel blockers

- Nifidipine (30-120 mg/day)
- Nicardipine (60-90 mg/day)

Antihypertensive Drug Classes

	Classes	Drug Names	Examples	Mechanism of Action	Main Effect on BP
A	ACE Inhibitors	"pril"	Lisinopril Enalapril	Inhibit ACE	↓ SVR, SV
A	ARBs	"sartan"	Losartan Valsartan	Block Angiotensin II Receptors	↓ SVR, SV
A	Alpha Blockers	"osin"	Doxazosin Terazosin	Block Alpha Receptors	↓ SVR
B	Beta Blockers	"lol"	Metoprolol Labetalol	Block Beta Receptors	↓ HR, SV
C	Calcium Channel Blockers (CCBs)	"dipine"	Amlodipine Nicardipine	Block Calcium Channels	↓ SVR
D	Diuretics	"ide"	Furosemide Hydrochlorothiazide	Facilitate Diuresis	↓ SV

**Alpha blockers refer to selective alpha-1 blockers, and calcium channel blockers refer to dihydropyridines

Reference

Ross and willson book of anatomy and physiology

Ashalatha book of anatomy and physiology

https://share.google/qRd54WVlsZt1Dtiw5

THANK YOU