MSH CONFERENCE 2025

- Majority of patient should be on combination therapy.
- Diabetic with stage 1 hypertension - ACE-I + INDAPAMIDE
- Combination therapy for hypertension mudt follow trials not just personal preference
- Diuretics highly favored in diabetics and ckd because of their reduced renin
- Indapamide more cv benefit, longer duration, more potent compared to HCTZ with added vasodilatory effect
- Indapamide as effective as enalapril in lowering bp without effecting renal function

Indapamide + Amlodipine

- More SBP reduction (vs Valsartan/amlo)
- Stroke Protection (Rimoldi Meta-analysis)
- Durable 24 hour BP control
- Less edema (vs Enalapril/Amlo)
- Patients that may respond well to C+ D Patients with High SBP/Wide PP Salt sensitive/ Low renin patients
- Patients at high risk of stroke

Secondary causes of hypertension

- Palpitations, headache, sweating - consider pheochromocytoma
- Hypertension with buffalo hump, moon facies, purplish abdominal striae, hirsutism - cushing syndrome
- Refractory hypertension need to do cxr - look for figure 3 sign -coarctation of aorta
- Different blood pressure in other extremities - consider inflammation of blood vessel causing narrowing of the artery - takayasu arteritis
- Hypertension with altered mental status - hypertensive encephalopathy
- Hypertension with irregularly irregular pulse - AF secondary to hypertension
- Renal artery stenosis - elevated creatinine after starting ace-i
- Uncontrolled hypertension, SOB, S3 gallop - APO

Hypertensive heart disease

NT-proBNP (N-terminal pro–B-type natriuretic peptide) is a lab test used to help diagnose and assess the severity of **heart failure**. It's released from the heart in response to increased wall stress (volume or pressure overload).

Interpreting NT-proBNP Levels (general guide):

Any value > 300 pg/mL in symptomatic patients (like SOB, S3, cold extremities) is considered suggestive of heart failure.

Additional Notes:

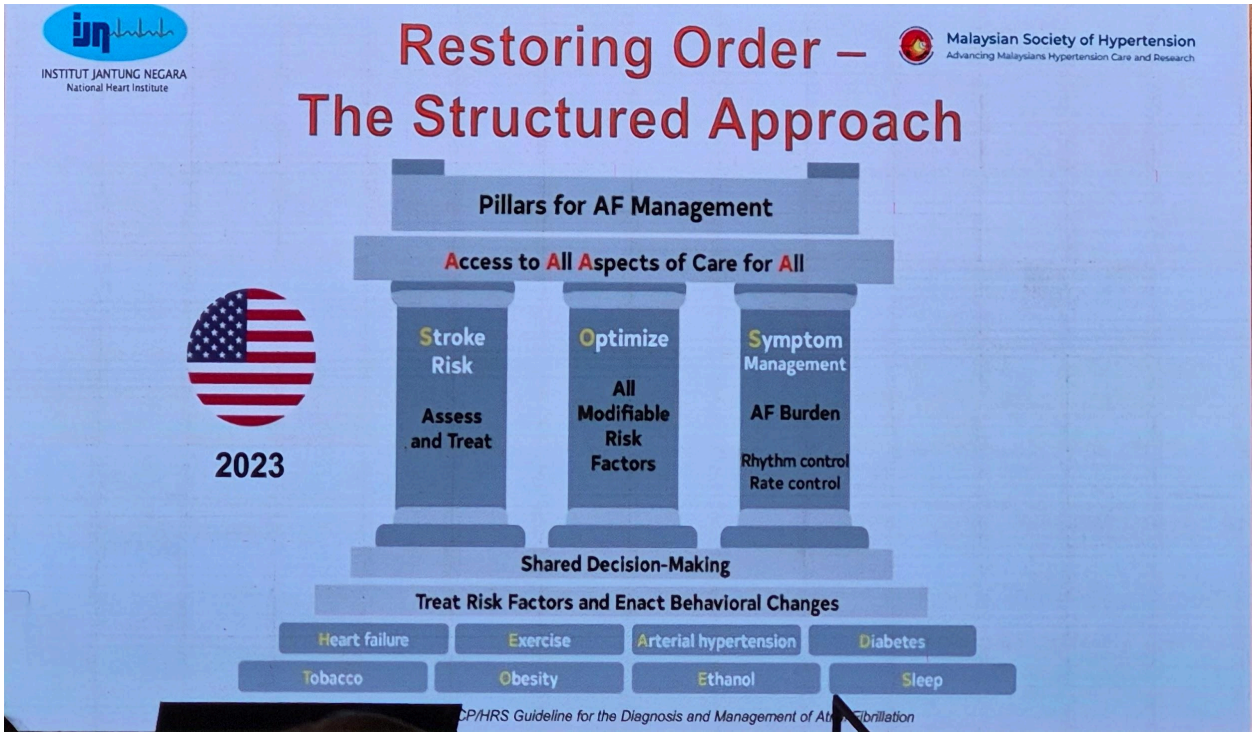
- **Very high values** (e.g., > 5,000–10,000 pg/mL) strongly support **acute decompensated heart failure**.
- **Elevated NT-proBNP** can also be seen in: renal failure, pulmonary embolism, sepsis, and older age.

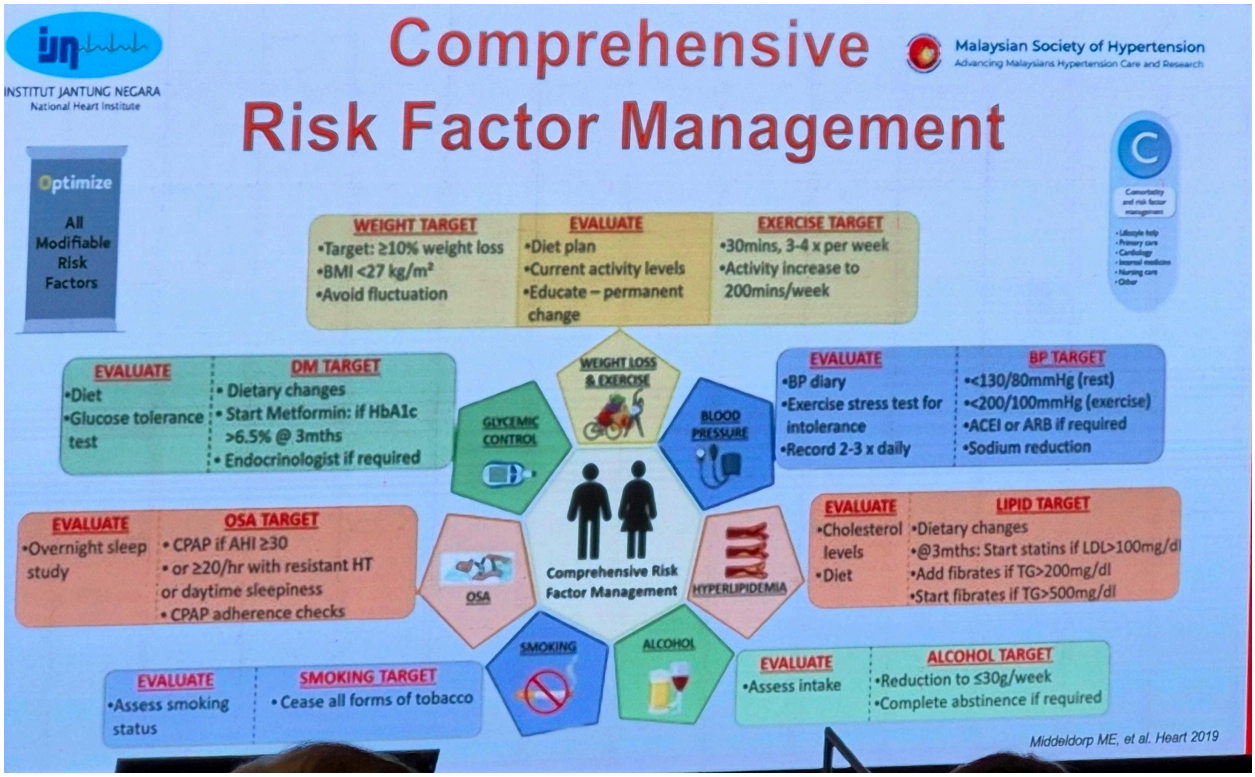
- Hypertensive heart disease continues to be a leading cause of CV morbidity and mortality
- New ESC 2024 guidelines recommend new targets for diagnosis and treatment
- Importance of early detection of HHD
    - Use of biomarkers
    - Treatment of HFpEF

- SGLT2 inhibitors have an established role
- Future directions
- GLP-1RA
- Finerenone
- Exercise therapy

Atrial fibrillation

- X5 risk to develop stroke, x3 risk to develop heart failure
- First line anti hyoertensive should be ACE-I/ARB -can prevent AF
- Routinely check the pulse of elderly with hypertension to do a quick screen for AF. If irregular proceed with ECG

- 

- 

- Early rhythm control is beneficial for cv outcome
- Aspirin is no longer preferred for stroke prevention in atrial fibrillation (AF) because it is much less effective than anticoagulants and still carries a non-negligible bleeding risk.

Key reasons:

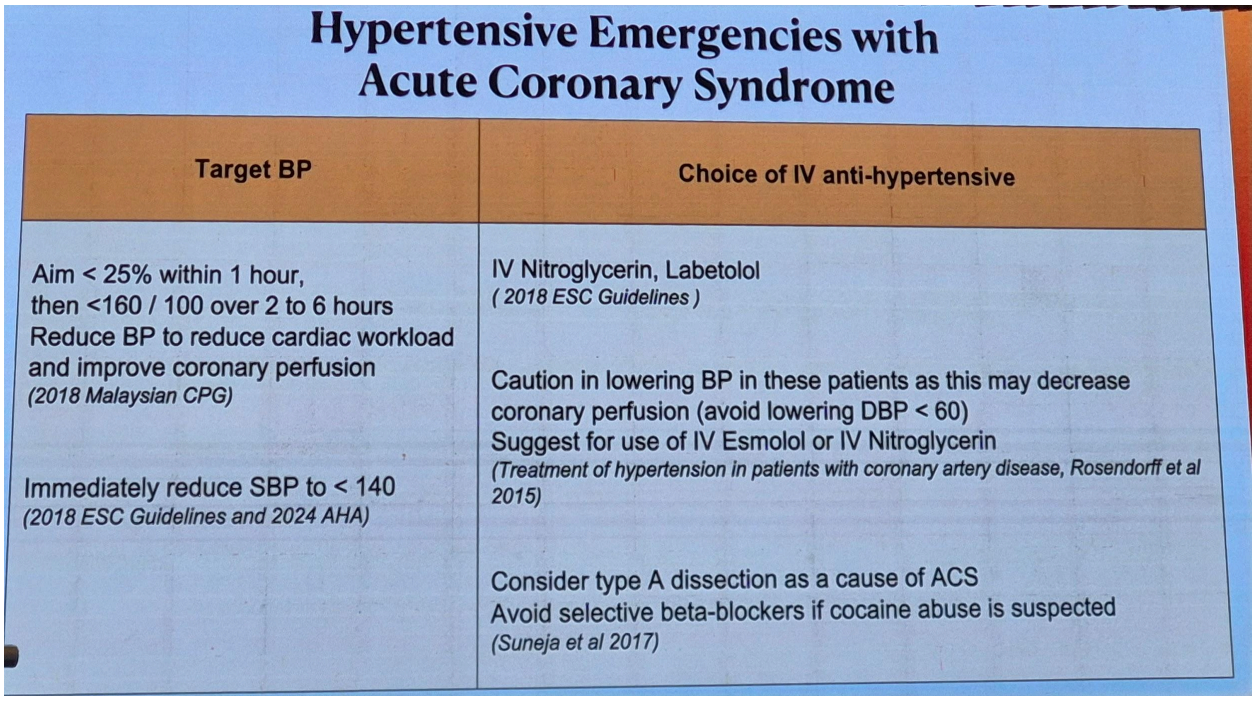
- Lower efficacy:
  - Aspirin reduces stroke risk by about 20–25%.
  - Anticoagulants like warfarin or direct oral anticoagulants (DOACs) (e.g., apixaban, rivaroxaban, dabigatran) reduce it by 60–70%.

- Comparable bleeding risk:
  - Aspirin has a similar risk of major bleeding as DOACs, despite being less effective.
  - This undermines its appeal as a "safer" option.

- Guideline changes:
  - ESC, AHA, and NICE guidelines no longer recommend aspirin for stroke prevention in AF.
  - Patients with a CHA_2DS_2-VASc score ≥1 in men or ≥2 in women should receive anticoagulation, not aspirin.
  - Would you like a chart comparing aspirin and modern anticoagulants in AF?

HYPERTENSIVE CRISES

- BP lowering agent should be short half-life parenteral agent - captopril, nifedipine, labetolol

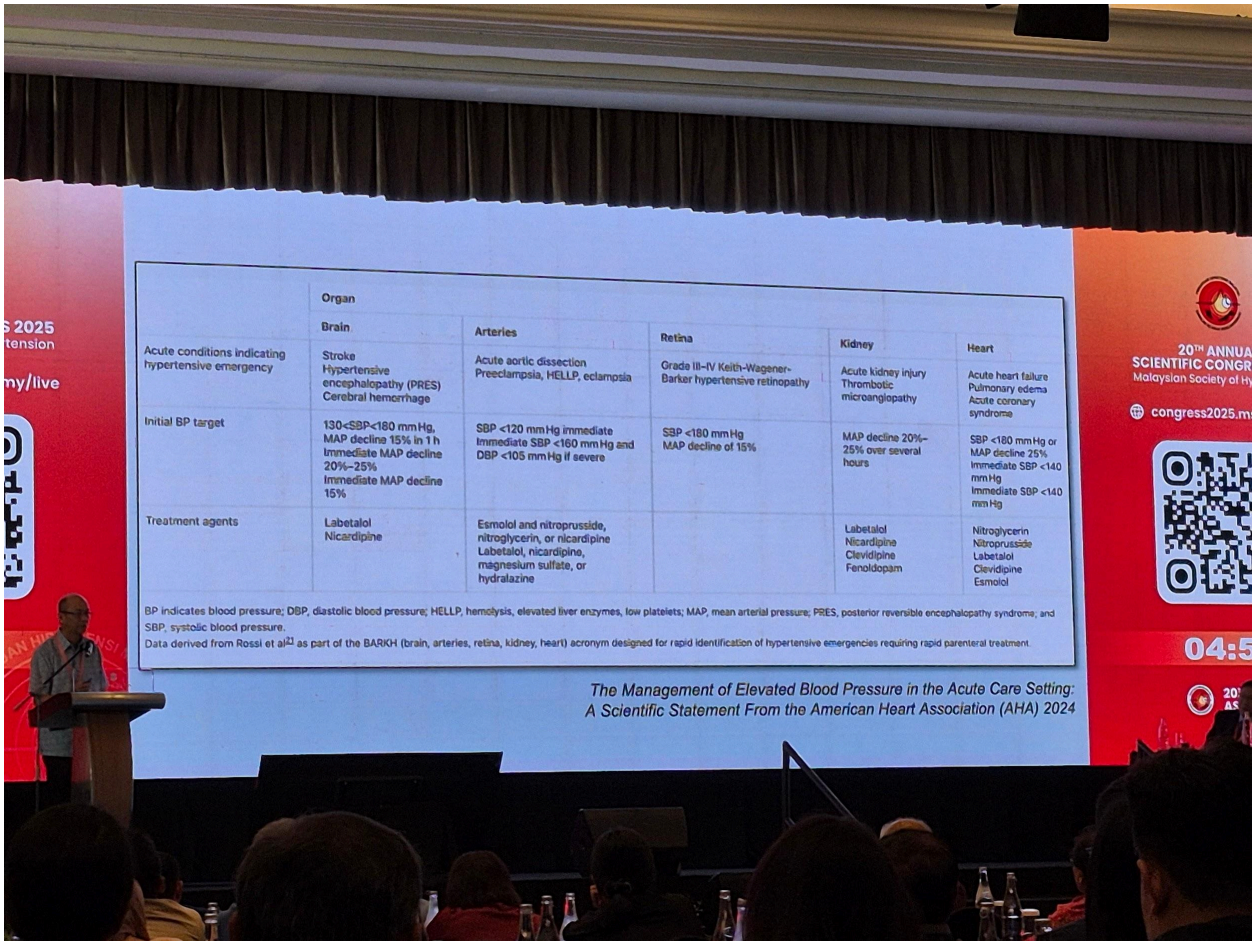


Hypertensive Emergencies with Acute Coronary Syndrome

Target BP	Choice of IV anti-hypertensive
Aim < 25% within 1 hour, then <160 / 100 over 2 to 6 hours Reduce BP to reduce cardiac workload and improve coronary perfusion *(2018 Malaysian CPG)*	IV Nitroglycerin, Labetolol *(2018 ESC Guidelines)*
Immediately reduce SBP to < 140 *(2018 ESC Guidelines and 2024 AHA)*	Caution in lowering BP in these patients as this may decrease coronary perfusion (avoid lowering DBP < 60) Suggest for use of IV Esmolol or IV Nitroglycerin *(Treatment of hypertension in patients with coronary artery disease, Rosendorff et al 2015)*
	Consider type A dissection as a cause of ACS Avoid selective beta-blockers if cocaine abuse is suspected *(Suneja et al 2017)*

- ## Hypertensive Emergencies with Acute Ischaemic Stroke (not for reperfusion therapy)

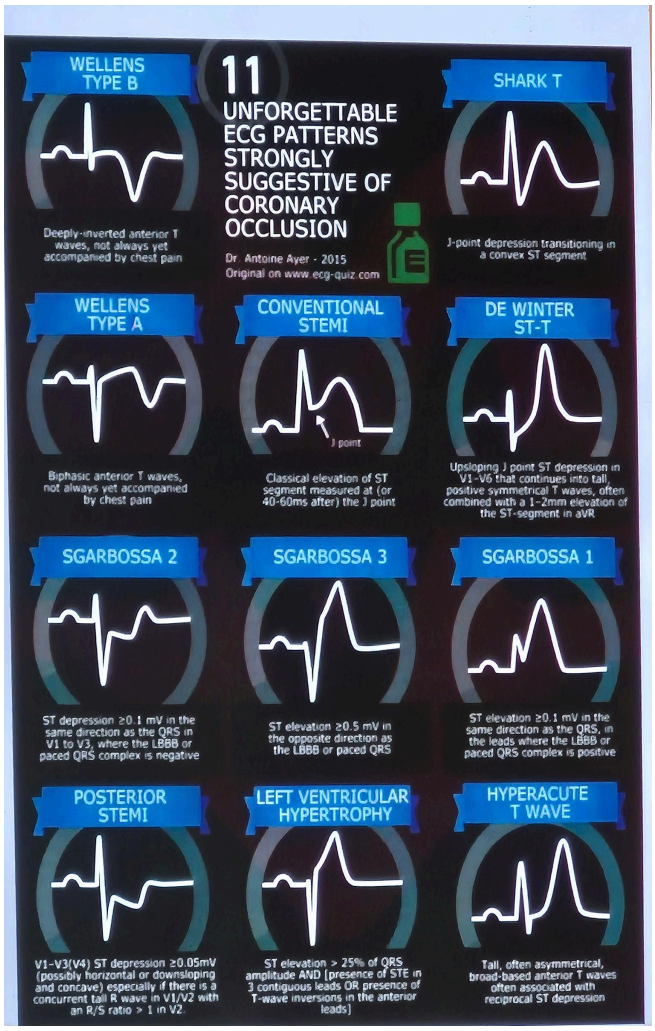
BP reading	Target BP	Choice of IV anti-hypertensive
SBP < 220 DBP < 120	There is no evidence for actively lowering BP	DO NOT TREAT
SBP ≥ 220 *DBP ≥ 120*	*Initial moderate relative reduction of 10 – 15% over a period of 24 hours from stroke onset* *(2024 ESC Guidelines)*	IV Labetolol 10 – 20 mg boluses at 10 minutes intervals up to 150 – 300 mg or 1mg/ml infusion, rate of infusion for labetolol as 1 – 3 mg/min Alternatives: IV Nicardipine infusion 5mg/hour titrate up by 2.5mg/hour at 5-15 minutes interval. Maximum dose 15mg/hour, once desired BP attained, reduced to 3mg/hour

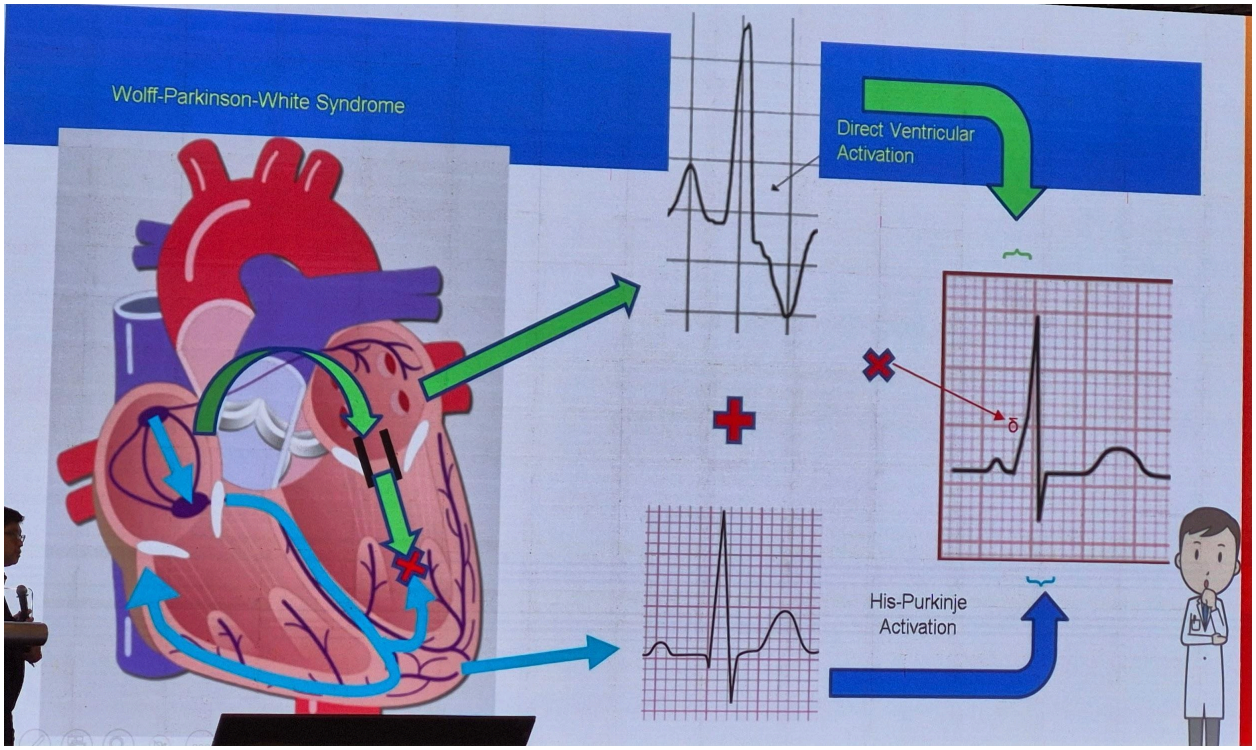
- 

- Aggressive lowering should be avoided - no proven benefit

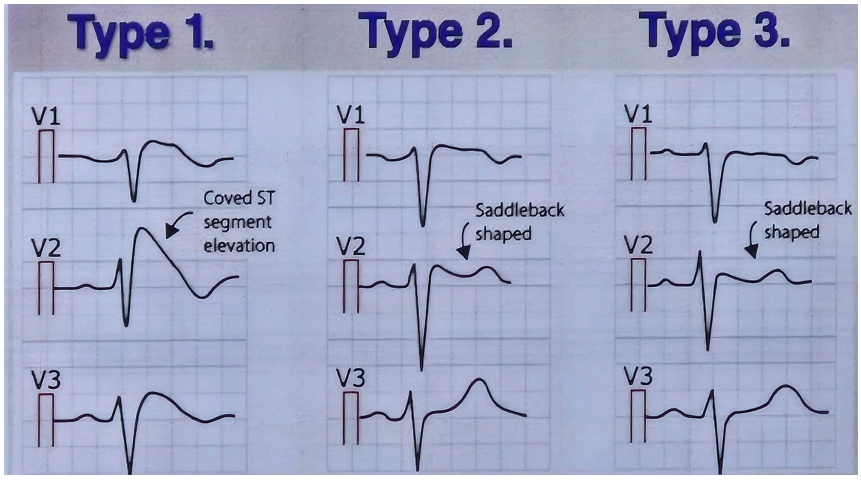
- In hpt urgency - target 25% reduction must not lower than 160/90
- Hypertensive urgency can be treated in primary setting

ECG

- 

- 

- WPW - Curative with abalation therapy
- Look for brugada pattern in patient with syncope



- In primary care, treat atrial flutter as atrial fibrillation. Start anti coagulation - refer
- Digoxin effect - reverse tick sign on ecg. Meaning digoxin is working properly
- Long QT - q wave more than half R R interval. Find drug causing prolonged QT

HYPERTENSION IN PAEDIATRIC

- Blood pressure must be checked even in paeds patient. Increasing prevalence of paeds hypertension - obese, unhealthy diet, sedentary lifestyle
- kids with dysmorphic features need to check bp on all limbs - coarctation of aorta in Turner Syndrome

- Simplified bp - >120/80 for kids <12 y.o
- >130/84 for kids > 16 y.o

Definition of HTN

Age	BP Category	HTN Threshold
<16 years	Normal BP	<90th percentile[a]
	High Normal BP	90th to < 95th percentile[a]
	Stage 1 Hypertension	≥95th to < 99th percentile + 5 mmHg[a]
	Stage 2 Hypertension	≥99th percentile +5 mmHg[a]
	Isolated Systolic Hypertension	SBP ≥95th and DBP < 90th percentile[a]
≥16 years	Normal BP	<130/85 mmHg
	High Normal BP	130–139/85–89 mmHg
	Stage 1 Hypertension	140–159/90–99 mmHg
	Stage 2 Hypertension	160–179/100–109 mmHg
	Stage 3 Hypertension	≥180/110 mmHg
	Isolated Systolic Hypertension	SBP ≥140 and DBP <90 mmHg

- Obese children need to check blood pressure
- 1 in 3 kids is overweight/obese.

Physical Examination Findings Suggestive of Definable Hypertension

	Finding†	Possible Etiology
Vital signs	Tachycardia	Hyperthyroidism, pheochromocytoma, neuroblastoma, primary hypertension
	Decreased lower extremity pulses; drop in BP from upper to lower extremities	Coarctation of the aorta
Eyes	Retinal changes	Severe hypertension, more likely to be associated with secondary hypertension
Ear, nose, and throat (ENT)	Adenotonsillar hypertrophy	Suggests association with sleep-disordered breathing (sleep apnea), snoring
Height/weight	Growth retardation	Chronic renal failure
	Obesity (high BMI)	Primary hypertension
	Truncal obesity	Cushing syndrome, insulin resistance syndrome
Head and neck	Moon facies	Cushing syndrome
	Elfin facies	Williams syndrome
	Webbed neck	Turner syndrome
	Thyromegaly	Hyperthyroidism
Skin	Pallor, flushing, diaphoresis	Pheochromocytoma
	Acne, hirsutism, striae	Cushing syndrome, anabolic steroid abuse
	Café-au-lait spots	Neurofibromatosis
	Adenoma sebaceum	Tuberous sclerosis
	[redacted]	Systemic lupus erythematosus

- All children aged >3 years should have their BP checked during a doctor's visit, with a proper BP cuff
- Prevalence of hypertension in children is increasing in tandem with the rise of childhood obesity prevalence
- Children with primary hypertension should be screened for co-morbidities and target-organ damaged
- Systematic evaluation of secondary hypertension in children is of upmost importance so as not to miss the treatable aetiologies

MANAGING HYPERTENSION IN ELDERLY

- Sbp 140-159 gives best outcome for survival in frail elderly patient
- Sbp < 140 increased mortality in frail patient
- Be mindful of white coat hypertension
- Consider deprescribing in elderly patient
- Routinely assess patient's frailty - clinical frailty scale
- in general, use no more than 2 meds