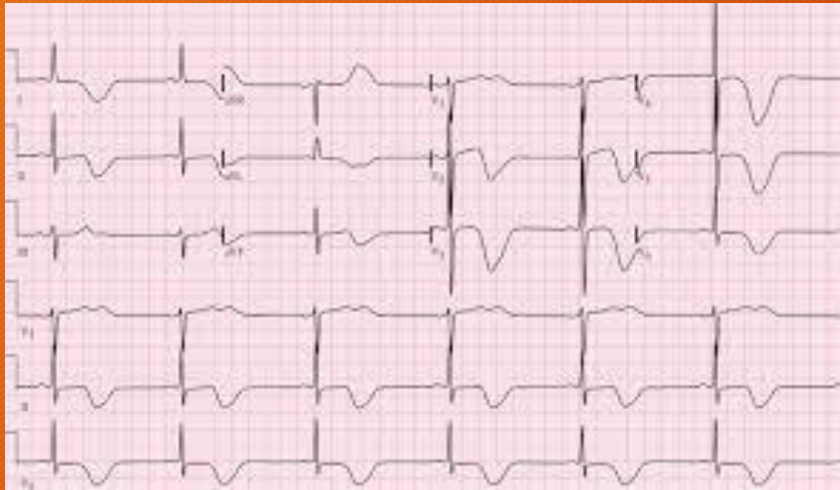


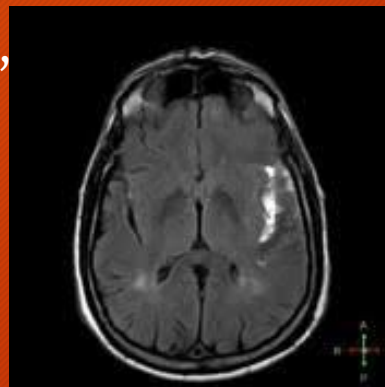
Advanced strategy in the management of Hypertension with new guidelines

Dr AM Thirugnanam, Senior Interventional Cardiologist,
Ipcard Cardiac Care Center, Hyderabad, India. 30-06-2018

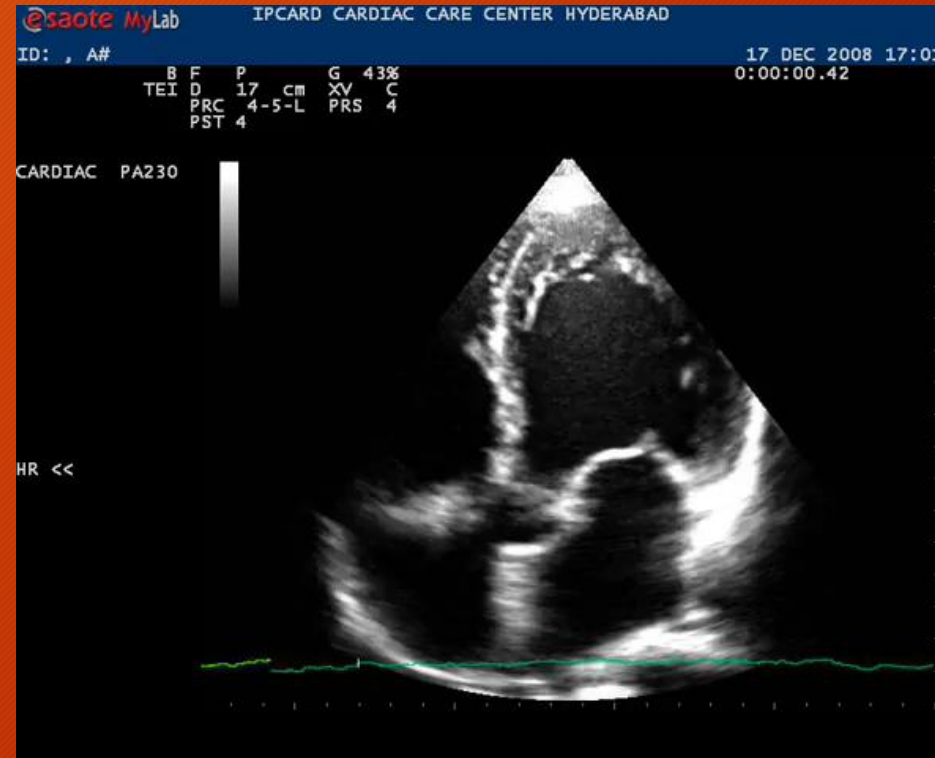
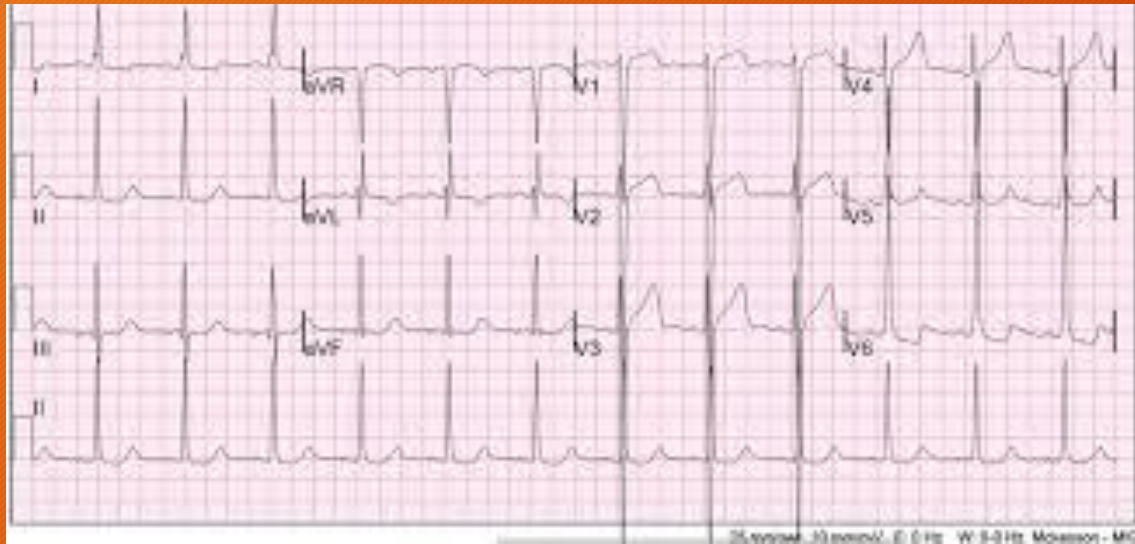
Case Study of a Patient in ICCI



BP-120/210mmhg, HR-60/min, O2-92%,
EF-55%, Intracerebral heomorrhage.



Patient with CHF with AHT



BP-110/190mmhg, Cr-2.4mmhg, EF-35%,



BP MEASUREMENT: if we fault at technique

Rest \geq 5 min, quiet

Seated, back supported

Cuff at midsternal level

Large enough cuff

Bladder center over artery

Deflate 2 mm Hg/sec

No talking during measurement

If initial BP $>$ goal BP:

3 readings, 1 min apart

Discard 1st, average last 2

Δ BP (mm Hg) if not done

\uparrow **12/6**

\uparrow 6/8

\uparrow \downarrow 2/inch

\uparrow **6-18/4-13**

\uparrow 3-5/2-3

\downarrow SBP/ \uparrow DBP

\uparrow 17/13

1st reading higher

- “Alerting response”

Selection Criteria for BP Cuff Size

Arm Circumference	Usual Cuff Size
22–26 cm	Small adult
27–34 cm	Adult
35–44 cm	Large adult
45–52 cm	Adult thigh

Definition of High BP

BP Category	SBP		DBP
Normal	<120 mm Hg	and	<80 mm Hg
Elevated	120–129 mm Hg	and	<80 mm Hg
Hypertension			
Stage 1	130–139 mm Hg	or	80–89 mm Hg
Stage 2	≥140 mm Hg	or	≥90 mm Hg

AOBP (Automated Office Blood Pressure)

- It takes multiple readings taken with a fully automated recorder with the patient resting alone in a quiet room.
- When these principles are followed, office-induced hypertension is eliminated
- AOBP exhibits a much stronger correlation with the awake ABPM
- AOBP also simplifies the definition of hypertension in that the cut point for a normal AOBP (< 135/85 mm Hg) is the same as for the awake ambulatory BP and home BP

Office BP measurement (OBP)

- Traditionally office blood pressure measurement has been performed using a sphygmomanometer and stethoscope.
- Auscultatory technique is increasingly being replaced by automated techniques.
 - mercury as a toxic metal is being phased out
 - properly validated oscillometric devices are readily available
- An alternative to the mercury sphygmomanometer is “hybrid” sphygmomanometer, which combines features of electronic and mercury devices.

Indications of ABPM

1. 24 hour Average BP
2. Daytime and nighttime BP pattern
3. Nocturnal dipping status and excessive dipping if any
4. Early morning surge
5. BP load i.e. percentage of reading higher than normal
6. BP variability derived from 95% confidence units

Uses of ABPM

- To confirm diagnosis of Hypertension
- Initiate antihypertensive treatment
- Poorly controlled blood pressure (resistant or labile hypertension)
- Frequent hypotensive symptoms
- White coat hypertension (i.e. high BP in doctor`s clinic, normal at home)
- Masked hypertension (i.e. normal BP in doctor`s clinic, high at home)

Frequency Distribution of Untreated HTN by Age

Isolated Systolic HTN

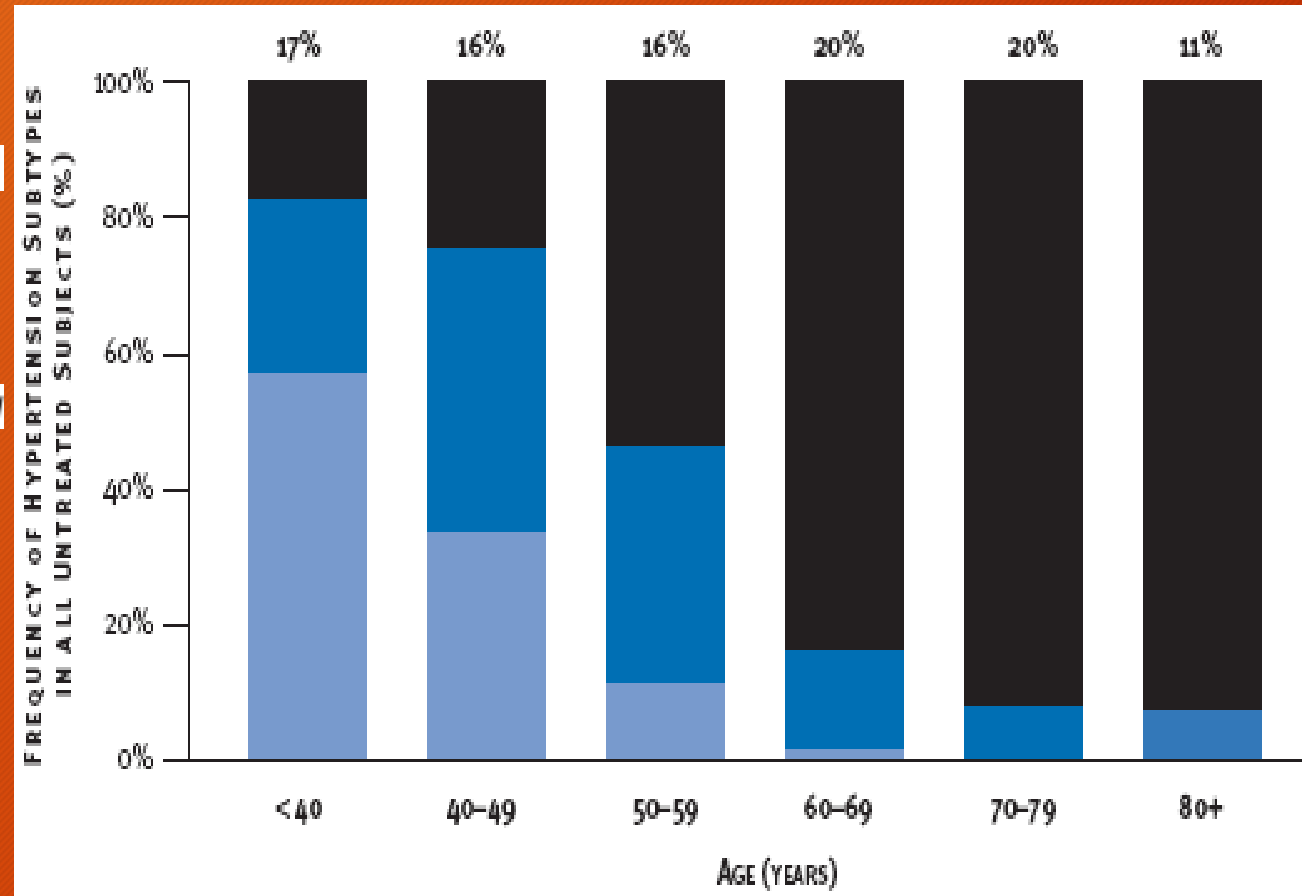
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Systolic Diastolic HTN

SDH

Isolated Diastolic HTN

IDH



Lifestyle modifications

MODIFICATION	RECOMMENDATION	APPROXIMATE SBP REDUCTION (RANGE) [†]
Weight reduction	Maintain normal body weight (body mass index 18.5–24.9 kg/m ²).	5–20 mmHg/10kg ⁹²⁻⁹³
Adopt DASH eating plan	Consume a diet rich in fruits, vegetables, and lowfat dairy products with a reduced content of saturated and total fat.	8–14 mmHg ⁹⁴⁻⁹⁵
Dietary sodium reduction	Reduce dietary sodium intake to no more than 100 mmol per day (2.4 g sodium or 6 g sodium chloride).	2–8 mmHg ⁹⁴⁻⁹⁶
Physical activity	Engage in regular aerobic physical activity such as brisk walking (at least 30 min per day, most days of the week).	4–9 mmHg ⁹⁷⁻⁹⁸
Moderation of alcohol consumption	Limit consumption to no more than 2 drinks (e.g., 24 oz beer, 10 oz wine, or 3 oz 80-proof whiskey) per day in most men, and to no more than 1 drink per day in women and lighter weight persons.	2–4 mmHg ⁹⁹

Dietary modifications in HTN

The Top Heart Healthy Foods



Social Media Diets, from others

- From carpenter, peon, Watchmen,
- Clerks
- Accountants
- Masons
- Dawalis

A Randomized Trial of Intensive versus Standard Blood-Pressure Control

The SPRINT Research Group*

	<i>Intensive (N=4678)</i>	<i>Standard (N=4683)</i>
Number of agents		
Average	2.7 (1.2)	1.8 (1.1)
0	125 (2.7)	530 (11.3)
1	493 (10.5)	1455 (31.1)
2	1429 (30.5)	1559 (33.3)
3	1486 (31.8)	807 (17.2)
4+	1137 (24.3)	323 (6.9)
ACE-I or angiotensin II antagonist	3580 (76.7)	2582 (55.2)
ACE inhibitors	1729 (37.0)	1320 (28.2)
Angiotensin II antagonists	1854 (39.7)	1264 (27.0)
Diuretics	3127 (67.0)	2006 (42.9)
Thiazide-type diuretics	2562 (54.9)	1557 (33.3)
Aldosterone receptor blockers	405 (8.7)	185 (4.0)
Other potassium-sparing diuretics	144 (3.1)	119 (2.5)
Without intrinsic sympathomimetic activity	1919 (41.1)	1440 (30.8)

Hypertensive Crises

- **Hypertensive Urgencies:** No progressive target-organ dysfunction.
(Accelerated Hypertension)
- **Hypertensive Emergencies:** Progressive end-organ dysfunction.
(Malignant Hypertension)

Hypertensive Emergencies

- Severely elevated BP (>180/120mmHg).
- With progressive target organ dysfunction.
- Require emergent lowering of BP.

- **Examples: Severely elevated BP with:**
 - Hypertensive encephalopathy
 - Acute left ventricular failure with pulmonary edema
 - Acute MI or unstable angina pectoris
 - Dissecting aortic aneurysm

Systolic and Diastolic Blood Pressure Thresholds for Blood Pressure

	Office blood pressure		Out-of-the-office blood pressure		
	Conventional	Automated		Ambulatory	Home
Normotension	<140 and < 90	<135 and <85	Daytime	<135 and <85	<135 and <85
Optimal	<120 and <80		Nighttime	<120 and <70	
Normal	120–129 or 80–84		24 hours	<130 and <80	
High-normal	130–139 or 85–89				
Hypertension	≥140 or ≥90	≥135 or ≥85	Daytime	≥135 or ≥85	≥135 or ≥85
Grade I (mild)	140–159 or 90–99		Nighttime	≥120 or ≥70	
Grade II (moderate)	160–179 or 100–109		24 hours	≥130 or ≥80	
Grade III (severe)	≥180 or ≥110				
Isolated systolic hypertension	≥140 and <90				

Young patient with HTN

IF not secondary causes

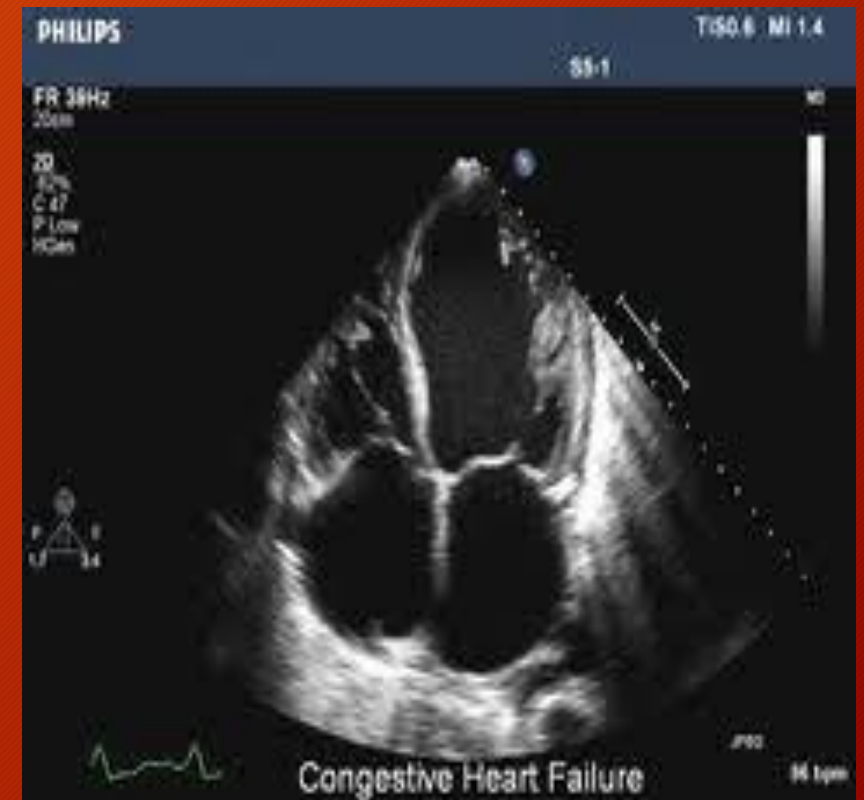
- If HR >60, 1st choice BB
- If level is not desirable add CCB
- If target is not achievable add CTL. HTCZ

Normal echo



Patient with DM, HTN

- Treatment for HTN
 - 1), First choice combo of BB and ACEI or ARB
 - 2), HCTZ or CTL
 - 3), CCB
 - 4), Alpha blockers
 - 5), Aldosterone RB
- Normal echo



Patients with CHF

Diuretics : Loop

ACEI

Non selective BBS: Carvedilol

Nitrates

Angiotensin nephrylysin receptor



ACS with Pulmonary edema

Loop Diuretics
IV nitroglycerin
AC, APL, etc



Patient with ASH with HTN with normal EF

- Treatment
- 1, BB
- 2, CCB,
- 3, ACEI or ARB
- 4, ALRB

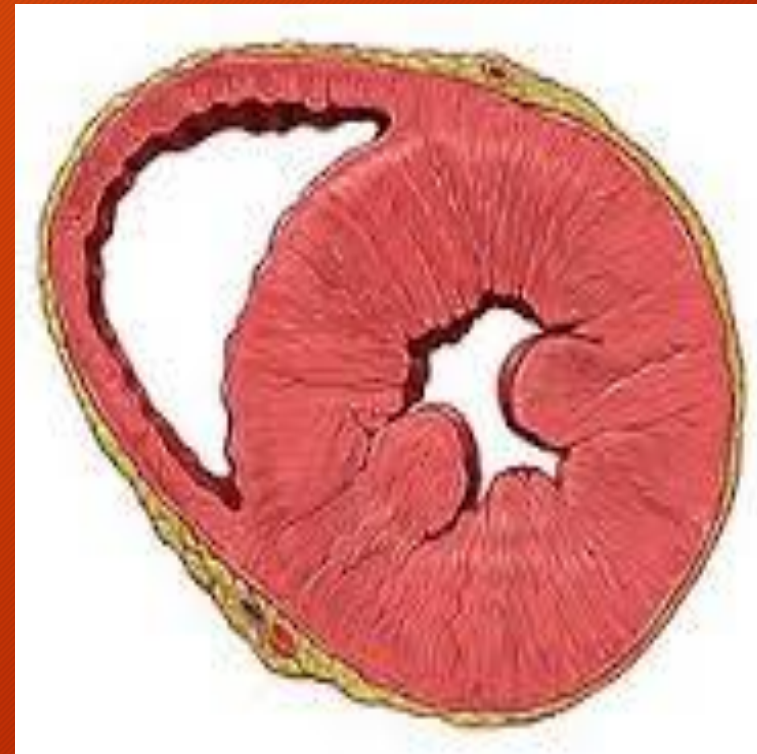
- ASH



Patient with LVH and HTN

- Treatment
- 1, BB
- 2, CCB if not DM, if DM ACEI or ARB
- ALRB

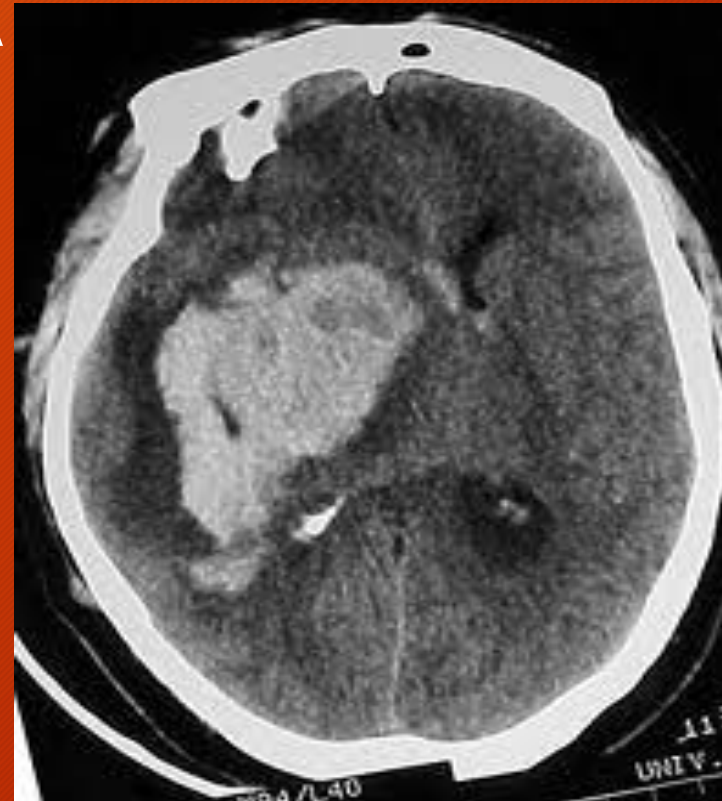
- LVH



HTN with CVA

- Treatment in NRF
- 1, ACEI or ARB
- 2, CCB
- 3, CTL
- 4, BB
- 5, ALRB

- CVA



HTN with Phechromacytoma

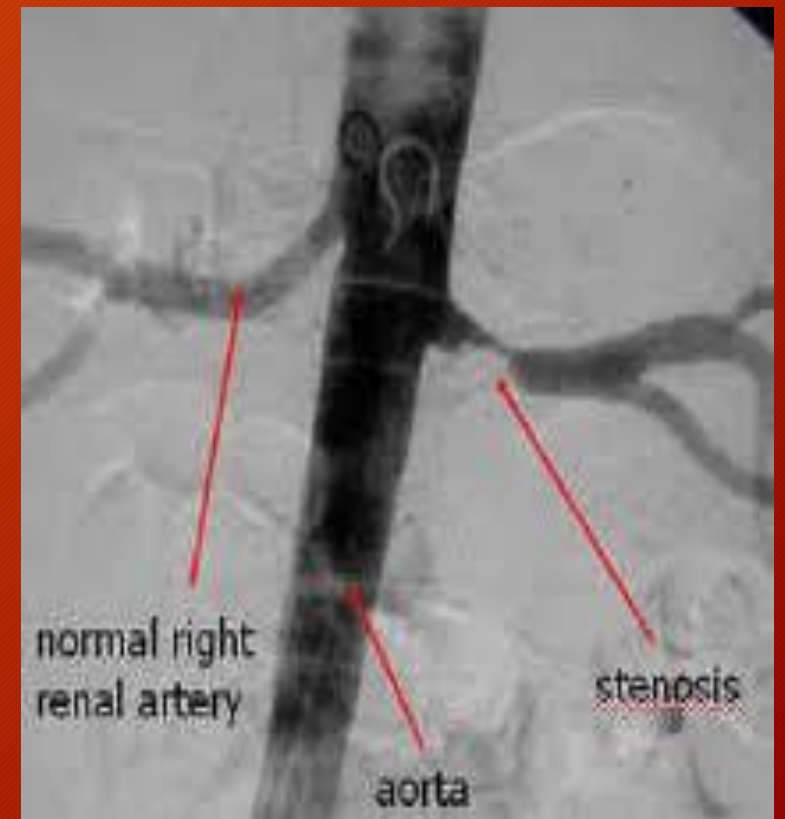
- Treatment
 - 1, Alpha blockers
 - 2, BBs
 - 3, ALRB
- Phechromacytoma



HTN in RAS

- Treatment
- 1, Ccb
- 2, Alpha blockers
- 3, LD
- 4, BBs
- 5, strictly no CTL, HCTZ, ACEI, ARB

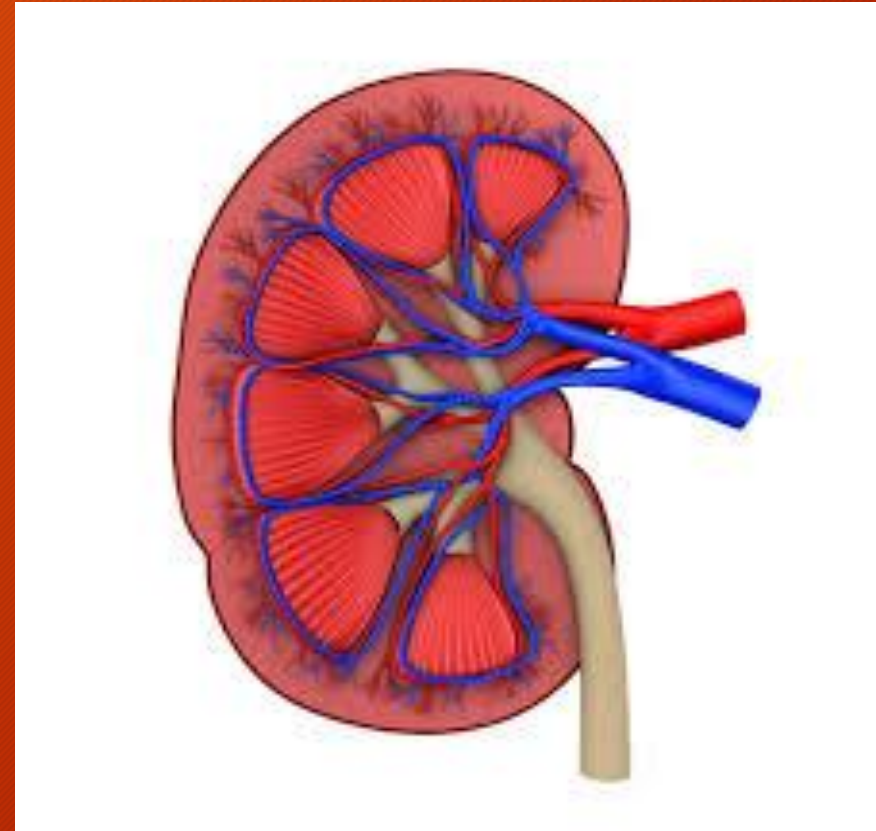
- Renal artery stenosis



HTN in CKD

- Treatment
- 1, CCb
- 2, BBs
- 3, Alpha Blockers
- 4, LDs
- 5, Nitroglycerine

- CKD



HTN in Aortic aneurysm

- Treatment
 - 1, BBs
 - 2, non vasodilating CCB
- Aortic aneurysm



HTN in Aortic dissection

- Treatment
- 1, IV BBs
- 2, Urgent surgery

- Aortic dissection



HTN with Pulmonary edema

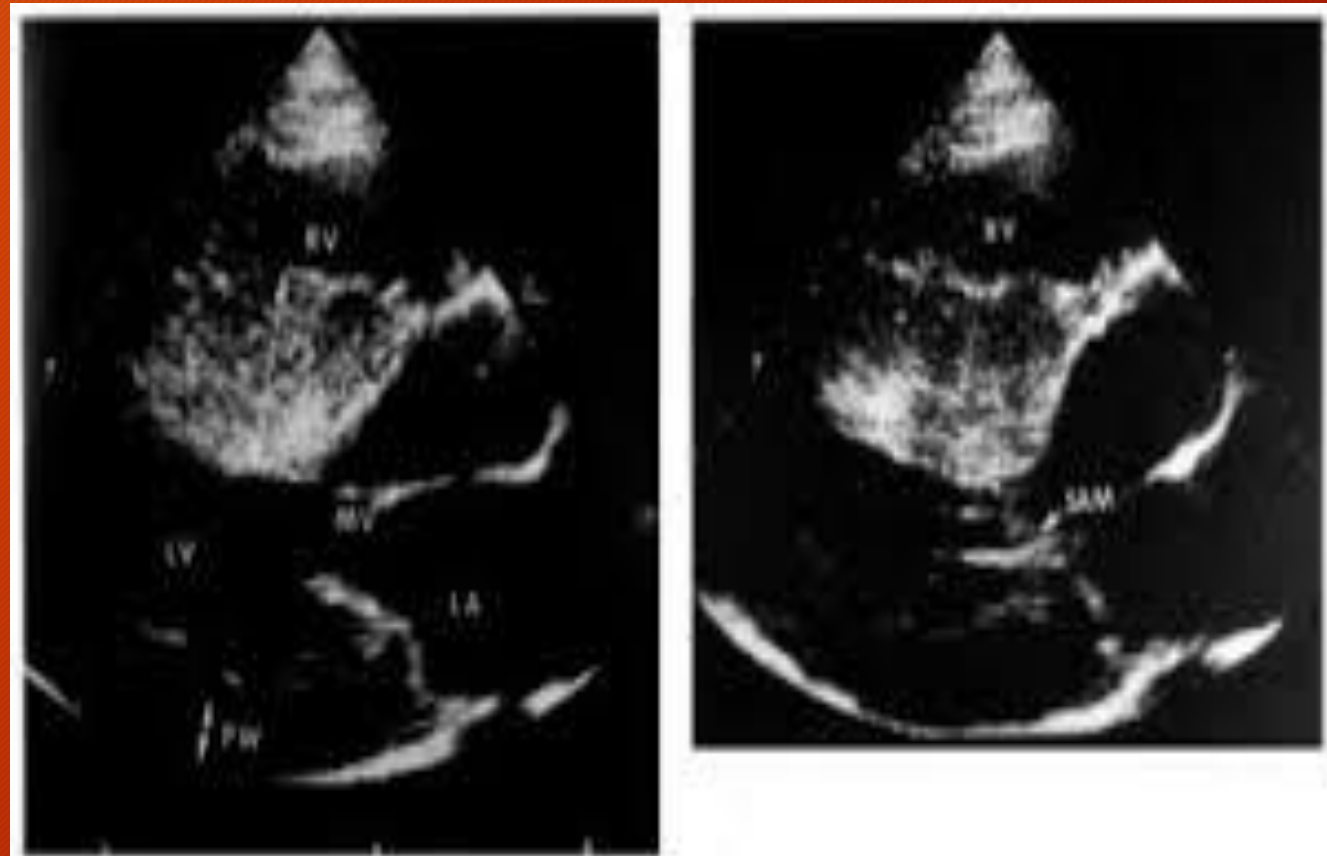
- Treatment for PE
- 1, Nitroglycerin
- 2, LDs



HOCM with HTN in normal EF

- Treatment
- 1, Verapamil
- 2, BB
- 3, diltiazem
- 4, strictly no vasodilators

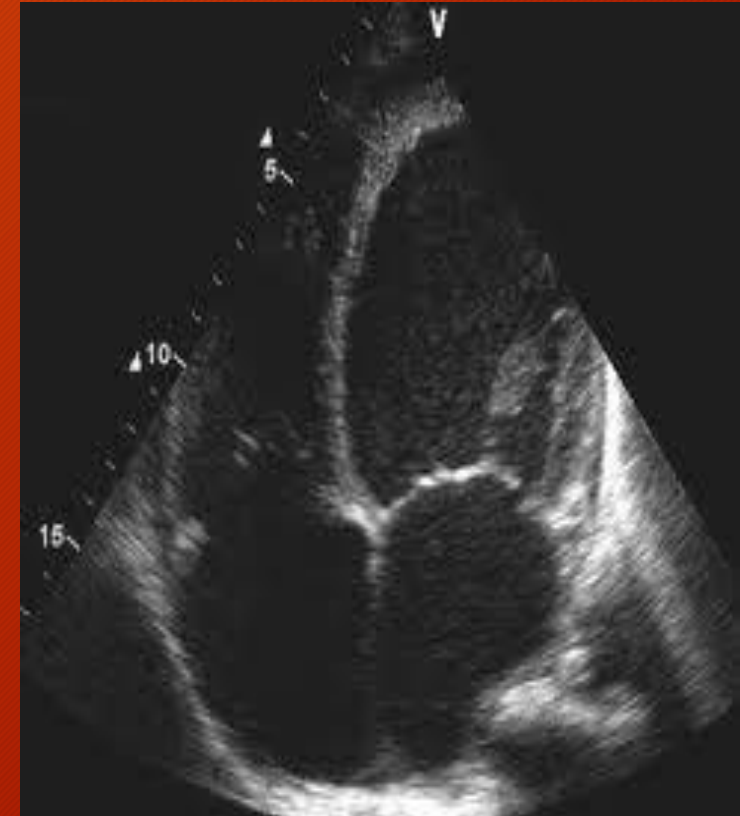
- HOCM echo



Patient with Dilated cardiomyopathy and CCF

- Treatment
- 1, ACEI or ARB
- 2, Carvedelol
- 3, ALRB, LD
- 4, mono or dinitrates or nitroglycerin

- Reduced EF30-40%



Device Based Treatment for HTN

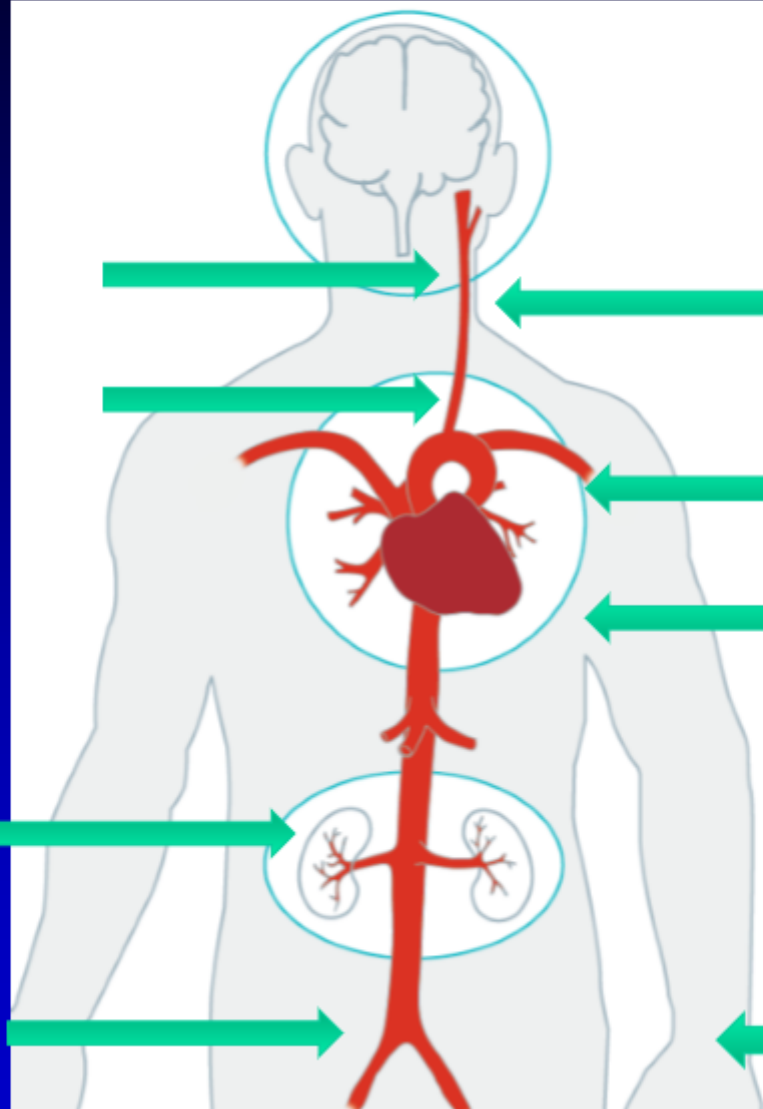
- 1, Endovascular Implant
- 2, Denervation of carotid bulb, body, median nerve, and renal nerve denervation.
- 3, Alcohol RND.
- 4, AV Fistula
- 5, Pace Maker mediated

The Solution: Device-based autonomic modulation

Carotid Bulb
Restoration
Carotid Body
Denervation

Renal
Denervation

AV Fistula



Baroreceptor
Stimulation

Aortic Arch
Stimulation

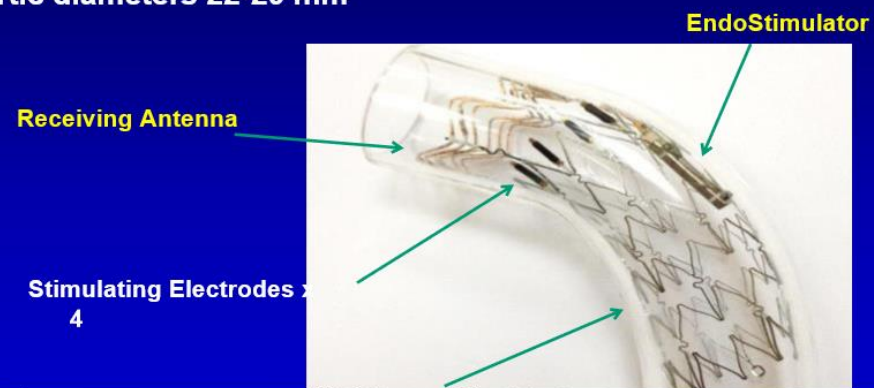
Pacemaker-
mediated

Median
Nerve

Aortic Implant

The Endovascular Implant Unit

- Leadless miniature stimulation device
- Self-expandable
- Aortic diameters 22-29 mm



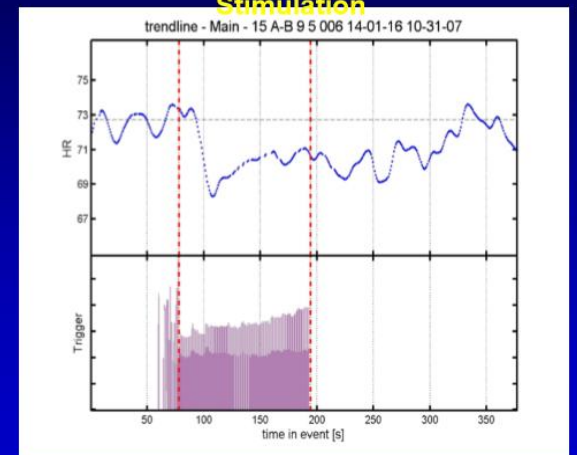
Response Readout

30d post implantation – in the Clinic

Implant Position



Heart Rate response to Stimulation



Renal Nerve Denervation



Thank you for your attention

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www.dramthirugnanam.com