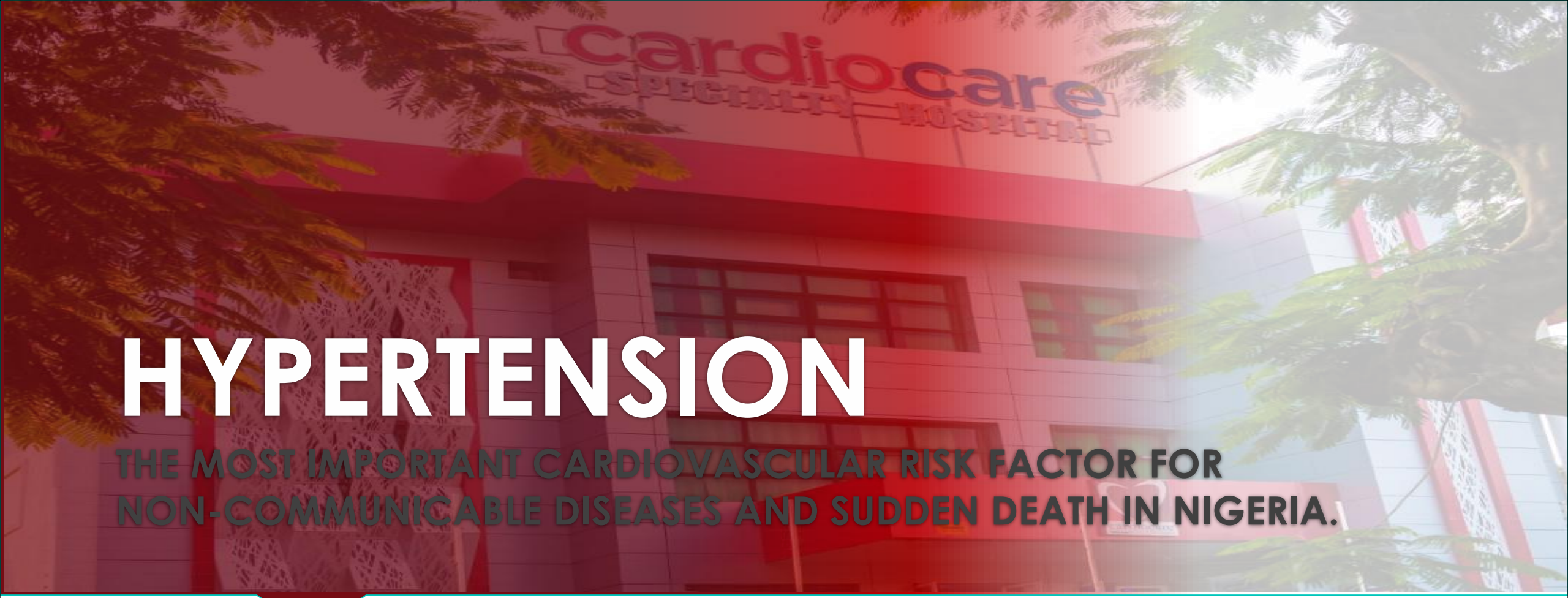

HYPERTENSION

THE MOST IMPORTANT CARDIOVASCULAR RISK FACTOR FOR NON-COMMUNICABLE DISEASES AND SUDDEN DEATH IN NIGERIA.

DR. INUWA MARIAM
Consultant Physician/Cardiologist

DR EZE MUNA
Consultant Family Physician
CARDIOCARE MULTISPECIALTY HOSPITAL, ABUJA.

8th Abuja Cardiovascular Symposium 2024

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Outline

1. Introduction
2. Diagnosis Cut-Offs & Terms
3. Proper Measurement of Blood Pressure
4. History and Examination
5. 5-Step Approach to to Hypertension- DR. ETC
    1. Diagnosis
    2. Risk Stratification
    3. Education
    4. Treating to Target
    5. Clinic Follow Up
6. Special Considerations

ndocrinology & Diabetology •Neurology •Nephrology and Dialysis •Hepatology •Critical and Intensive Care •Internal Medicine

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CASE 1

- 34yr old now P2+0 (2A) who gave birth 3weeks ago presented in the emergency with a home BP that was elevated and she was anxious. No chest pain, dyspnea or any other complains. She is a known hypertensive for about 2years on Tab Aldomet 500mg tds, Labetalol 400mg tds and has been regular on medications. Pregnancy and delivery was uneventful

- O/E young lady, not pale, anicteric, acyanosed, afebrile, nil pedal oedema

- CVS PR 72bpm normal full, regular

CASE 1

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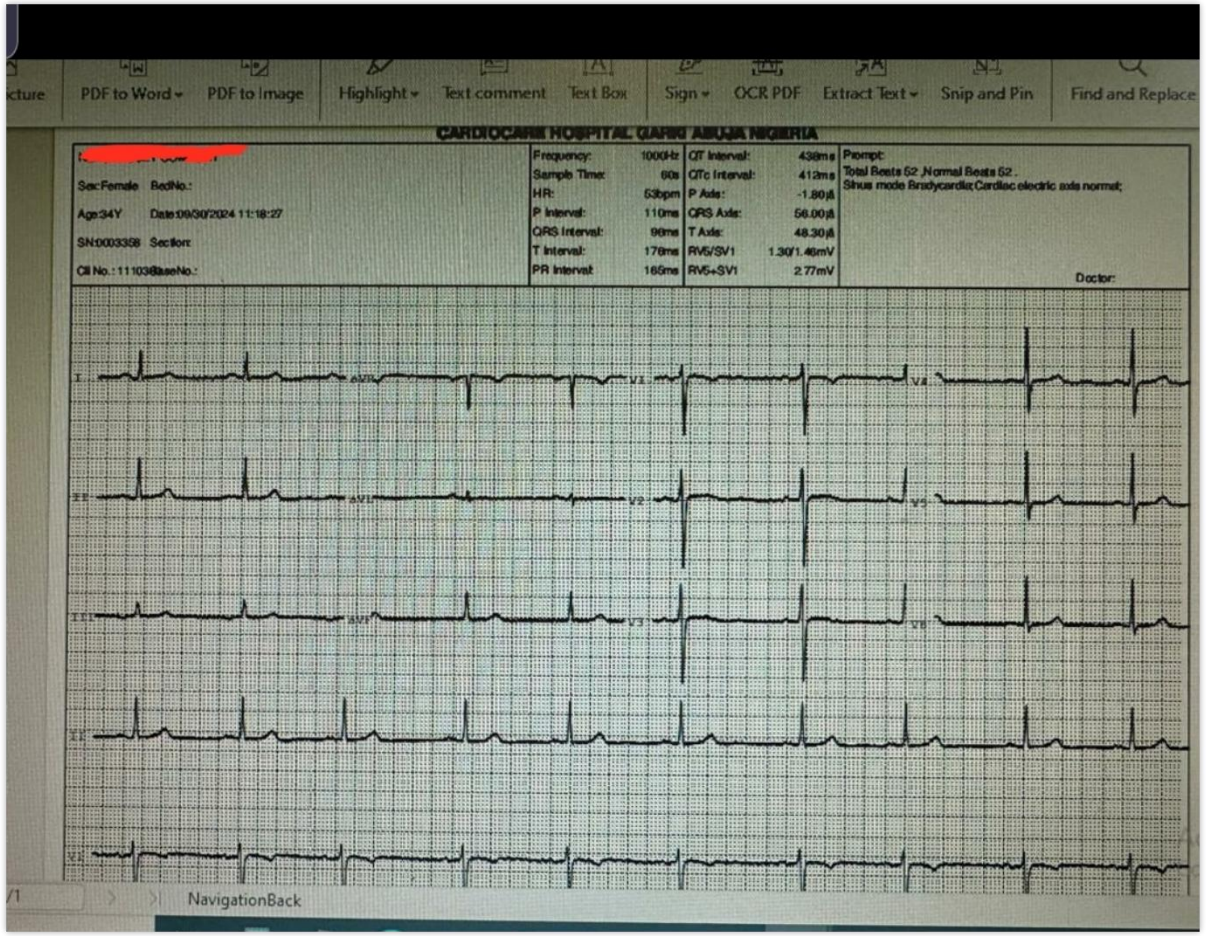

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What is the correct answer?

ⓘ Start presenting to display the poll results on this slide.

1. Introduction

Introduction

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Reversing Medical Tourism

- Cardiac catheterization procedures in the dedicated catheterization laboratory (cathlab) are apparently at an infantile stage in Nigeria.
- The cardiac cathlab is invaluable in the practice of Cardiology as its use is the **gold standard** for diagnosis and treatment of many cardiovascular conditions.
- In Northern Nigeria, **two prior indigenous cathlab installations had been reported**, one public and one private which had become non-functional.
- However, since 2015 there has reportedly been **no functional indigenous cardiac cathlab in the entire Northern Nigeria.**

1.1 INTRODUCTION

- Hypertension is defined as the level of blood pressure at which
  - the benefits of treatment unequivocally outweigh the risks of treatment
  - the office systolic BP values are ≥140 mmHg and/or diastolic BP values are ≥90 mmHg

Who is Cardiocare M cialty Hospital?

Northern Nigeria's **pioneer standalone Institution** wholly dedicated to comprehensive **Cardiovascular and Internal Medicine**.

Received Multiple **Awards for Excellence in Service.**

We are a **Support Hospital** for your practice in Nigeria through our **specialized services, training, and research in collaboration with you**

1.2 INTRODUCTION

- Persistently high BP in systemic arteries is the hallmark of hypertension, which is the most important modifiable risk factor for all-cause and CVD morbidity and mortality globally.

- *Hypertension may be primary, which may develop as a result of a variety of environmental or genetic causes or it may be secondary due to renal, vascular and endocrine causes.*

- *Primary or essential hypertension accounts for 90-*

1.3 HTN: WORLD'S LEADING KILLER

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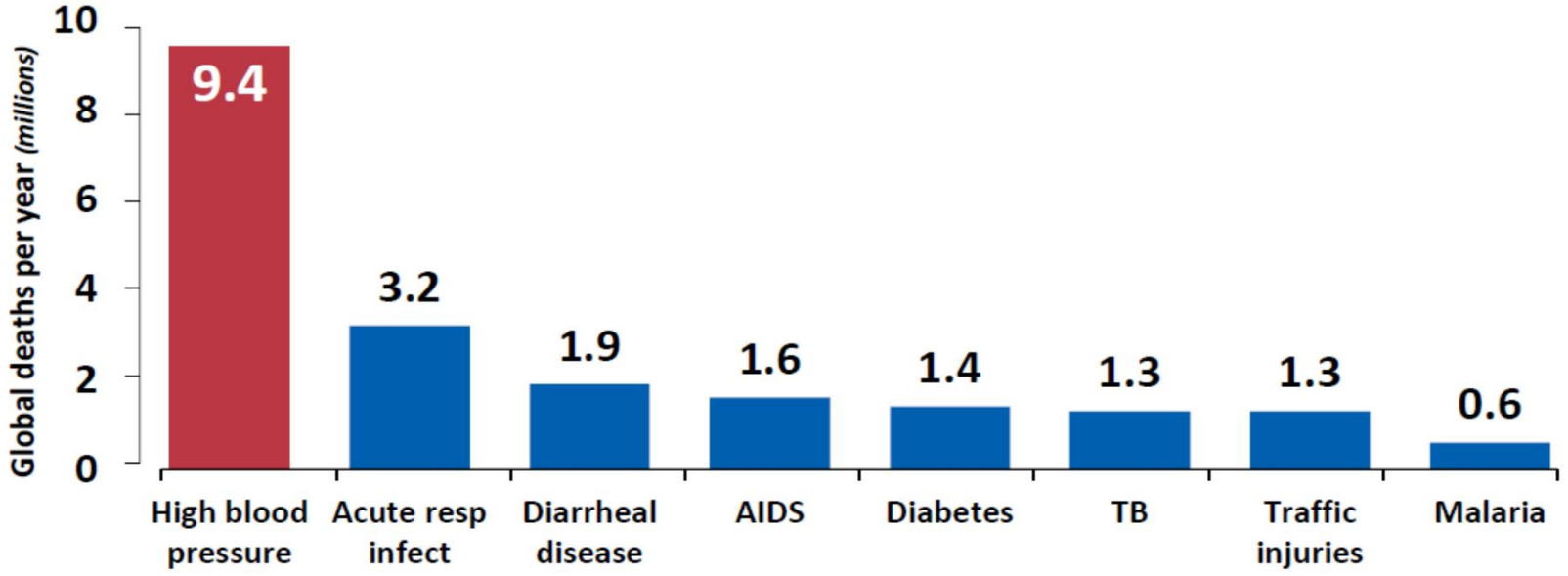
High blood pressure kills nearly as many people worldwide each year as all infectious diseases combined.



Source: World Health Organization, 2010

1.4 HTN CONTROL KEY TO REDUCING CVD DEATHS

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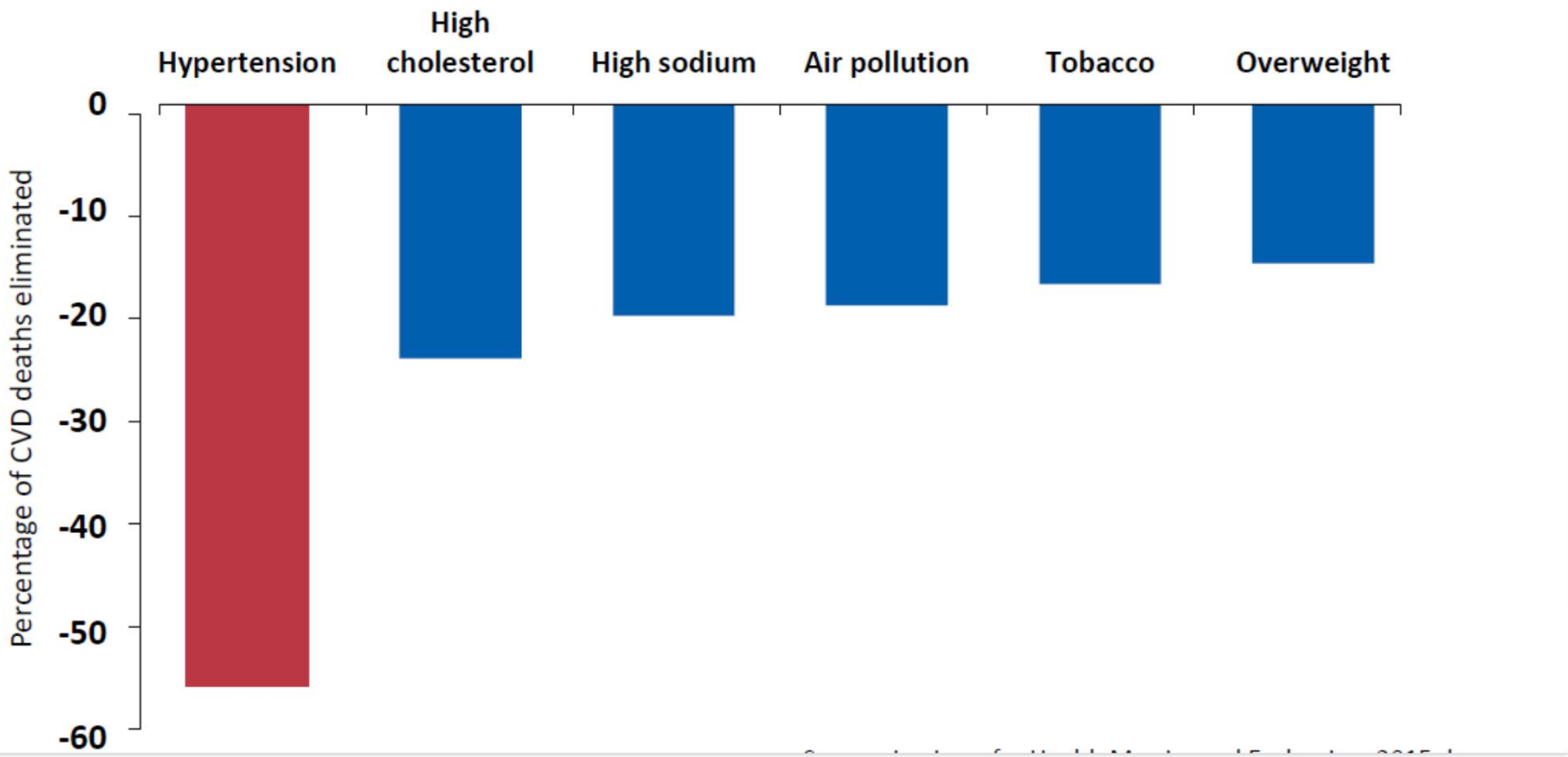
The percentage by which deaths from cardiovascular diseases (CVDs) could be reduced if specific risk factors were brought under control:



Abuja Cardiovascular Symposia- Five (8) so far.

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- Over 7**50 participants from over 30**
- Trained in **PRIMARY CARDIOVASCU**
  - ECG interpretation,
  - Basic Management of Diabetes, Hyperte
  - Basic Life Support
- **10 CME points & Certificate**

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2. What are some of the cut-offs & terms in the Diagnosis of Hypertension?

DIAGNOSING HYPERTENSION

2.1 Hypertension cut-offs

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CATEGORY	SYSTOLIC (mmHg)		DIASTOLIC (mmHg)
Optimal	<120	and	<80
Normal	120-129	and/or	80-84
High Normal	130-139	and/or	85-89
Grade 1 Hypertension	140-159	and/or	90-99
Grade 2 Hypertension	160-179	and/or	100-109
Grade 3 Hypertension	≥180	and/or	≥110
Isolated Systolic Hypertension	≥140	and	<90

2.2 Definitions of Hypertension according to Office, ambulatory and home BP levels

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	SYSTOLIC		DIASTOLIC
Office BP	≥ 140	*AND/OR*	≥ 90
Home BP Mean	≥ 135	*AND/OR*	≥ 85
Ambulatory BP			
Daytime Mean	≥ 135	*AND/OR*	≥ 85
Night-time Mean	≥ 120	*AND/OR*	≥ 70
24-H Mean	≥ 130	*AND/OR*	≥ 80

Our Experience

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- A total of 1000 **procedures** were carried out on 847 patients over the last 5 years
- Male to female ratio of **4.4:1**,
- Mean age of **59.0 (+/- 12.4)** years
- Of the patients,
  - 32 (10.6%) were partially financed through discounts, sponsorships, and donations from:
    - Cardiocare/Limi Hospitals
    - Nigerian Cardiovascular Education Foundation

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WHITE COAT HYPERTENSION

1. ELEVATED OFFICE BLOOD PRESSURE
   AND
2. NORMAL AMBULATORY / HOME BLOOD PRESSURE

MASKED HYPERTENSION

1. NORMAL OFFICE BLOOD PRESSURE
   AND
2. ELEVATED AMBULATORY/ HOME BLOOD PRESSURE

2.3 Some Terms

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	NORMAL OFFICE BLOOD PRESSURE	ABNORMAL OFFICE BLOOD PRESSURE
NORMAL OUT-OF-OFFICE BLOOD PRESSURE (ABPM, HBPM)	True Normotension	White Coat Uncontrolled Hypertension (WUCH)
ABNORMAL OUT-OF-OFFICE BLOOD PRESSURE (ABPM, HBPM)	Masked Uncontrolled Hypertension (MUCH)	Sustained Uncontrolled Hypertension (SUCH)

2.3 Some Terms

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	OFFICE BLOOD PRESSURE	OUT-OF-OFFICE BLOOD PRESSURE (ABPM, HBPM)
1. True Normotension	Normal	Normal
2. Masked Uncontrolled Hypertension (MUCH)	Normal	Abnormal
3. White Coat Uncontrolled Hypertension (WUCH)	Abnormal	Normal
4. Sustained Uncontrolled Hypertension (SUCH)	Abnormal	Abnormal
	Abnormal	Abnormal

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Fixing Heart Diseases without Open Surgery while awake.

8th Abuja C

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2.6 SECONDARY HYPERTENSION

- Obstructive Sleep Apnea
- Renal Parenchymal Disease
- Renovascular Disease
  - Atherosclerotic Renovascular disease
  - Fibromuscular Dysplasia (more in young women)
- Primary Aldosteronism
- Phaeochromocytoma
- Cushing's Syndrome
- Thyroid Disease

3. How is Blood Pressure Properly Measured?

3.1 MEASURING BP

Patients should be seated comfortably in a quiet environment for 5 min before beginning BP measurements.
Three BP measurements should be recorded, 1–2 min apart, and additional measurements only if the first two readings differ by > 10 mmHg. BP is recorded as the average of the last two BP readings.
Additional measurements may have to be performed in patients with unstable BP values due to arrhythmias, such as in patients with AF, in whom manual auscultatory methods should be used as most automated devices have not been validated for BP measurement in patients with AF.
Use a standard bladder cuff (12–13 cm wide and 35 cm long) for most patients, but have larger and smaller cuffs available for larger (arm circumference > 32 cm) and thinner arms, respectively.
The cuff should be positioned at the level of the heart with the back and arm supported, to avoid muscle contraction and isometric-exercise dependent increases in BP.

ESC European Society of Cardiology

Williams, Mancia et al., J Hypertens 2018;36:1953-2041 and Eur Heart J 2018;39:3021-3104

European Society of Hypertension

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Coronary Angiography

& Percutaneous Coronary Intervention

For Heart Attacks/Myocardial Infarction, Angina, Ischemic Heart Disease/Failure-
Stents, Balloon Angioplasty, & Chronic Total Occlusions (CTO) of Heart Vessels

3.1 MEASURING BP

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When using auscultatory methods, use phase I and V (sudden reduction/disappearance) Korotkoff sounds to identify SBP and DBP, respectively.
Measure BP in both arms at the first visit to detect possible between-arm differences. Use the arm with the higher value as the reference.
Measure BP 1 minute and 3 min after standing from seated position in all patients at the first measurement to exclude orthostatic hypotension. Lying and standing BP measurements should also be considered in subsequent visits in older people, in people with diabetes, and in other conditions in which orthostatic hypotension may frequently occur.
Record heart rate and use pulse palpation to exclude arrhythmia.

ESC European Society of Cardiology

Williams, Mancia et al., J Hypertens 2018;36:1953-2041 and Eur Heart J 2018;39:3021-3104

European Society of Hypertension

3.2 Pre-Conditions for BP Measurement

- No exercise, emotional excitement nor caffeine in the last 30-60mins
- **Resting and supported** position of back, arms, legs
- No crossed legs
- No clothing under cuff
- Appropriately sized & placed cuff
- Quiet room- No talking to, about, or by subject
- No digital preference, nor rounding up/down

3.3 Measuring Blood Pressure

- Use either:
  1. **Mercury sphygmomanometer:**
     - *The diastolic reading is taken at the level when sounds disappear (Korotkoff phase V).*
  2. **Validated Professional Electronic Device**
  3. **Aneroid manometer-** recently calibrated
- Two or 3 measurements should be taken at each visit, and averaged
- At least 1-2 minutes should be allowed between readings.
- BP values obtained outside the clinical setting are lower and correlate better with target organ damage than BP measurements by healthcare personnel.
- ***Wrist-based sphyg largely not recommended***

Why Consider Cardiocare Multispecialty Hospital?

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1. Team of consultants & residents
2. **Detailed back-referral medical reports** when indicated/requested
3. Opportunity to **discuss & collaborate** with team on referred cases
4. **24/7 emergencies** and **same-day/next-day appointments**
5. Over **400 successful cathlab cases** for:
   - Pacemakers, CRTs, Coronary & Peripheral revascularization with stents, IVC filters, etc. while awake with no scars for vascular interventions.
6. **Ultramodern world-class equipment** & fully computerized systems

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3.4 Appropriate Cuff & Technique

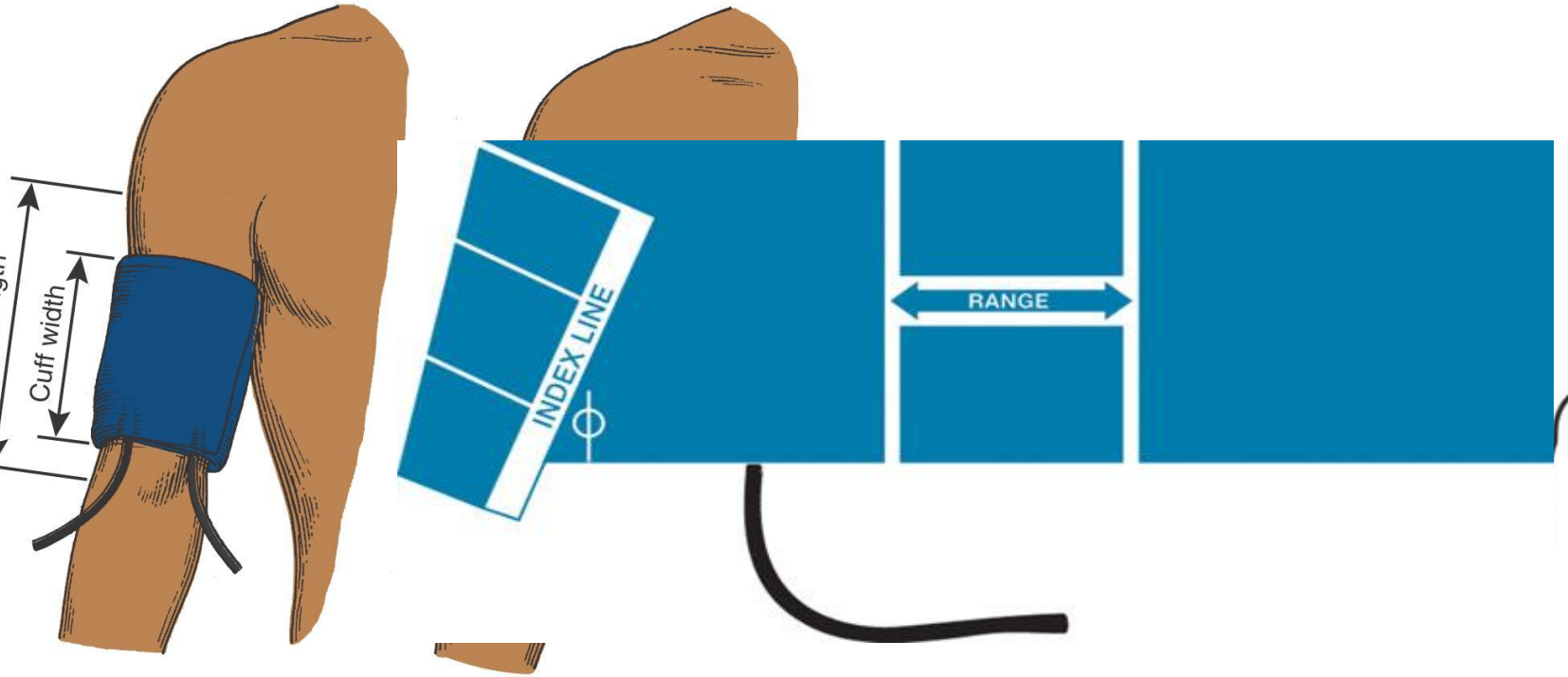
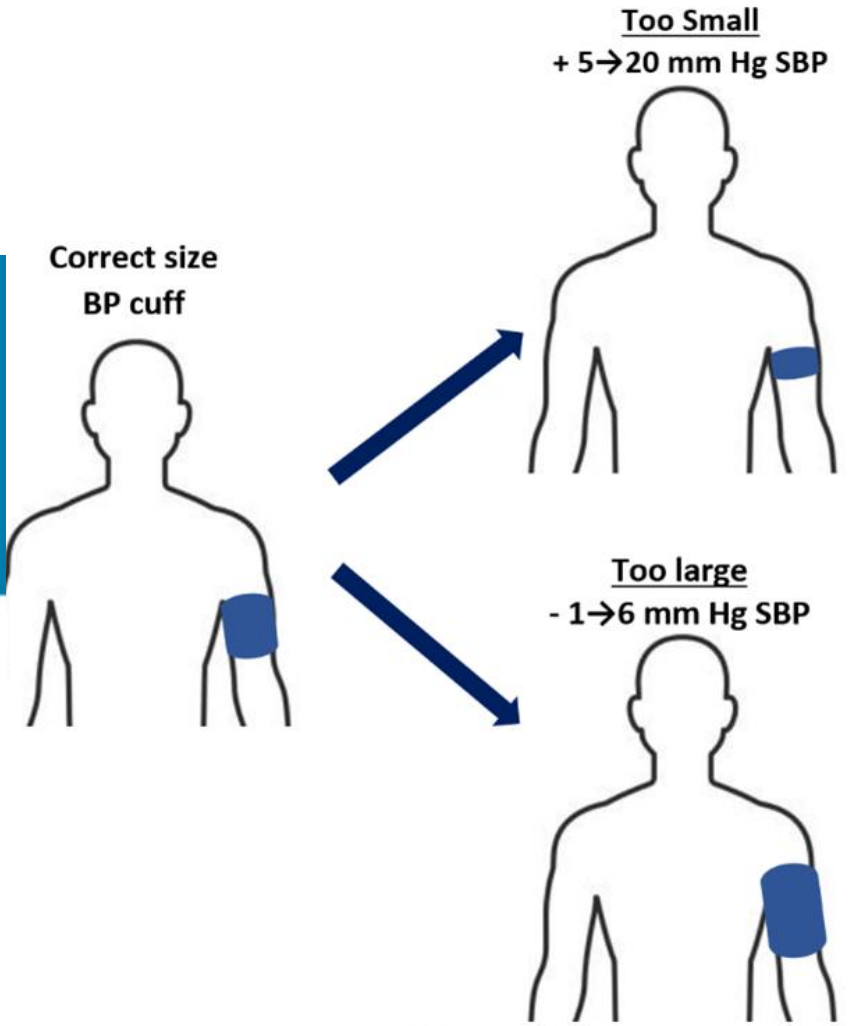


FIG. 29-13 Guidelines for proper blood pressure cuff size. Cuff width 20% more than upper-arm diameter or 40% of circumference and two thirds of arm length.



3.5 Cuff Application

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HOW TO USE THE CUFF CORRECTLY

Point 1

Please use the same arm for every measurement.

Point 2

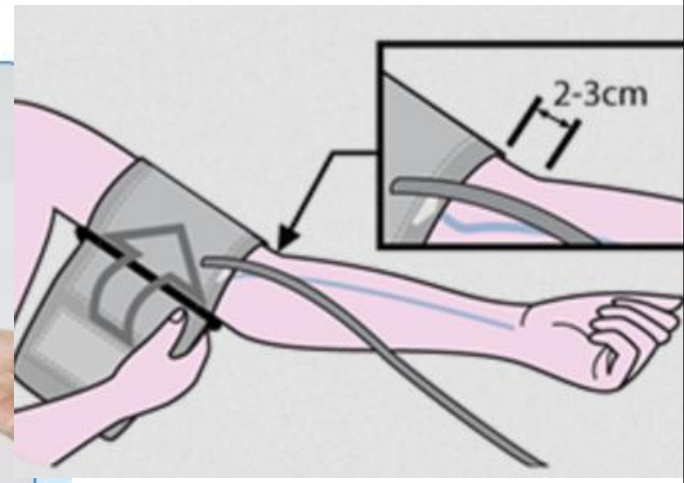
Keep the Lower edge of the cuff 0.8”-1.2” (2-3cm) from the inner elbow.

Point 3

Keep a certain space between the cuff and arm.
Ensure that one finger can be inserted.

Point 4

The air tube is on the inside ofyour arm and aligned with your middle finger.



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Practical Demonstrations

What are the Cardiocare Multispecialty Hospital's services?

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We provide **24/7 world-class healthcare solutions** for patients, hospitals, and their doctors in:

- ✓ **Interventional Cardiology (Cathlab)**
- ✓ **Endocrinology, Diabetology & Metabolic Medicine**
- ✓ **Cardiology**
- ✓ **Nephrology, Transplant & Dialysis**
- ✓ **Neurology**
- ✓ **Rheumatology**
- ✓ **Pulmonology**
- ✓ **Critical Care**
- ✓ **Cardiothoracic Surgery**
- ✓ **General Internal Medicine**
- ✓ **Comprehensive Medical Checkups**

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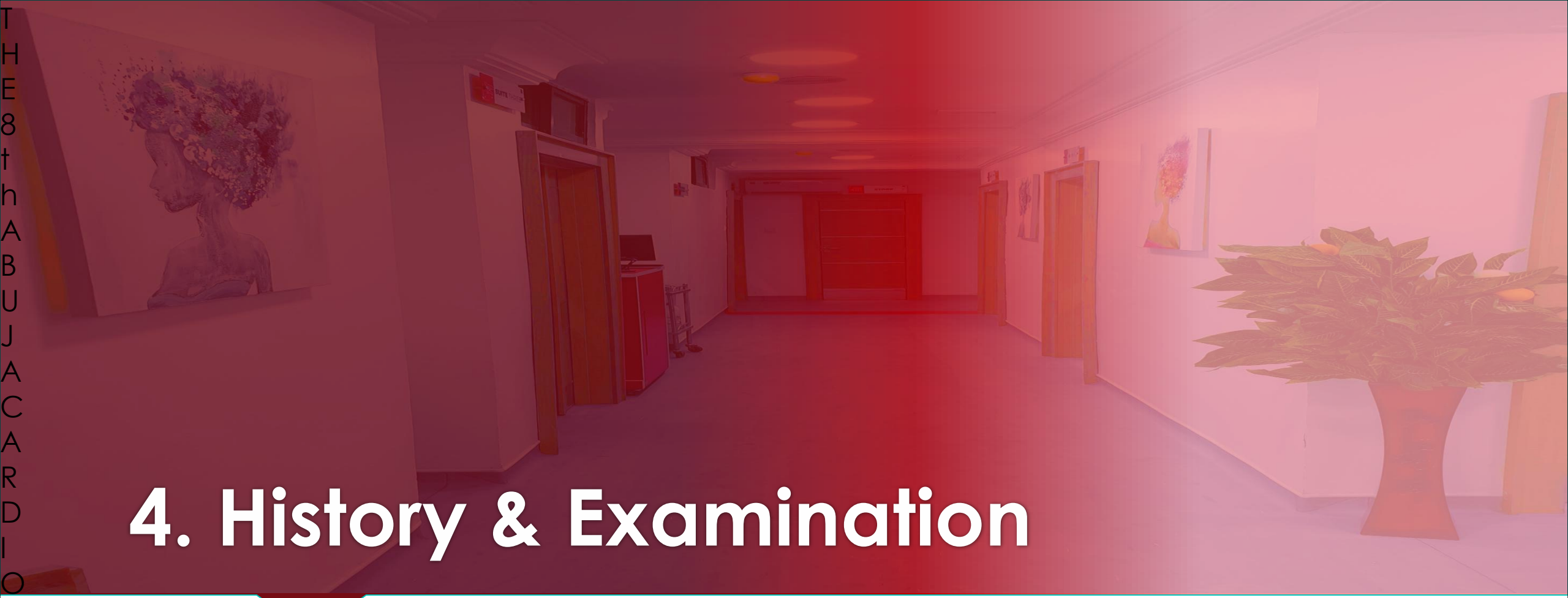


4. History & Examination

HISTORY

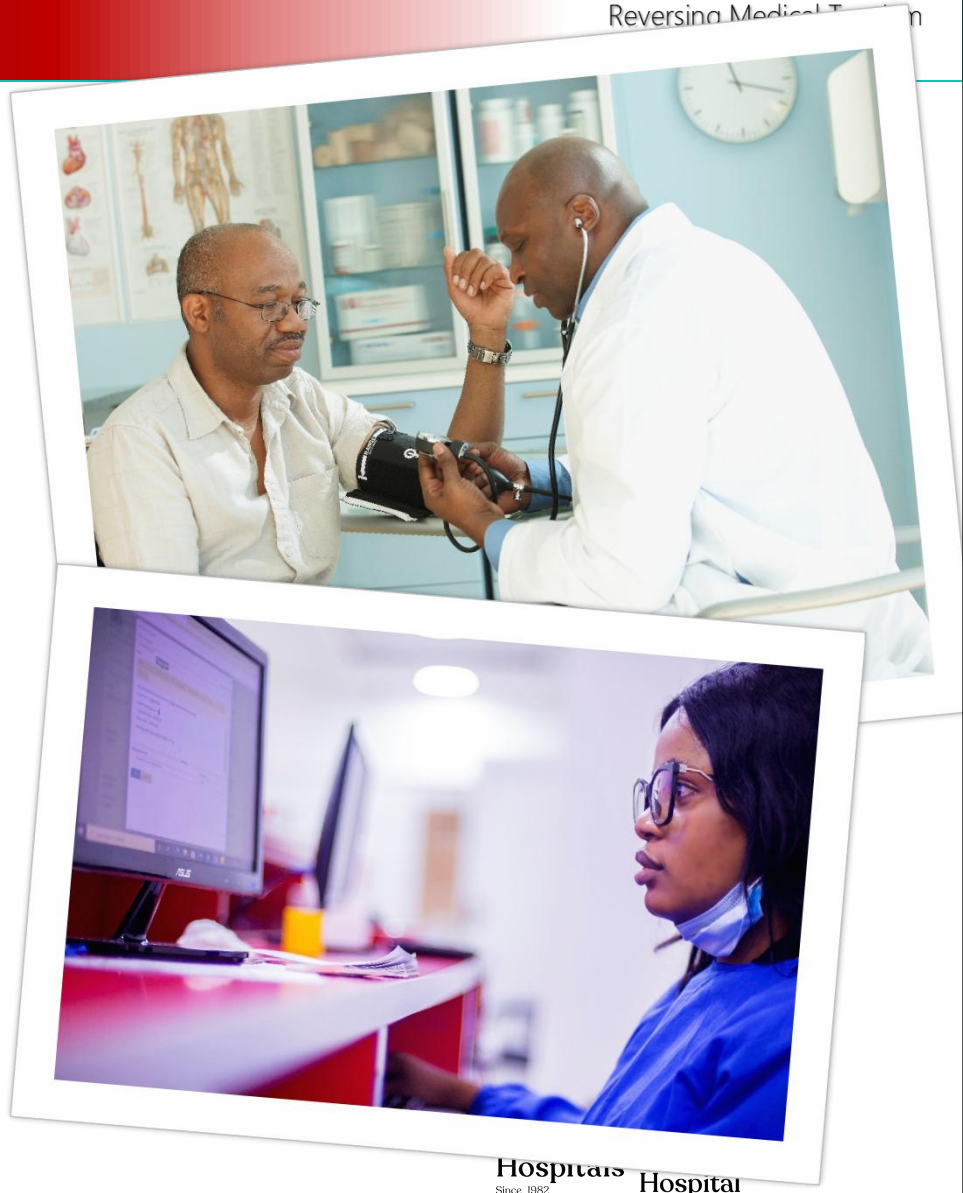
History and symptoms of HMOD, CVD, stroke, and renal disease
Brain and eyes: headache, vertigo, syncope, impaired vision, TIA, sensory or motor deficit, stroke, carotid revascularization, cognitive impairment, or dementia (in the elderly)
Heart: chest pain, shortness of breath, oedema, myocardial infarction, coronary revascularization, syncope, history of palpitations, arrhythmias (especially AF), heart failure
Kidney: thirst, polyuria, nocturia, haematuria, urinary tract infections
Peripheral arteries: cold extremities, intermittent claudication, pain-free walking distance, pain at rest, peripheral revascularization
Patient or family history of CKD (e.g. polycystic kidney disease)

HISTORY

Risk factors
Family and personal history of hypertension, CVD, stroke, or renal disease
Family and personal history of associated risk factors (e.g. familial hypercholesterolaemia)
Smoking history
Dietary history and salt intake
Alcohol consumption
Lack of physical exercise/sedentary lifestyle
History of erectile dysfunction
Sleep history, snoring, sleep apnoea (information also from partner)
Previous hypertension in pregnancy/pre-eclampsia

How to refer patients to Consider Cardiocare Multispecialty Hospital?

1. Give a standard referral letter & preferably attach any available results
2. **Call:** 0908-331-7777, 0817 444 0888
3. **WhatsApp**: 0908-331-7777
4. **Email**: frontdesk@cardiocare.ng
5. **Visit**: 5, Giza Close Area 11, Garki (off Dunukofia Street-near FCDA) Abuja-FCT.
6. Kindly indicate Doctor's name, & email/phone number especially if you wish to receive a medical report afterwards.



HISTORY

History of possible secondary hypertension
Young onset of grade 2 or 3 hypertension (< 40 years), or sudden development of hypertension or rapidly worsening BP in older patients
History of renal/urinary tract disease
Recreational drug/substance abuse/concurrent therapies: corticosteroids, nasal vasoconstrictor, chemotherapy, yohimbine, liquorice
Repetitive episodes of sweating, headache, anxiety, palpitations, suggestive of pheochromocytoma
History of spontaneous or diuretic-provoked hypokalaemia, episodes of muscle weakness, and tetany (hyperaldosteronism)
Symptoms suggestive of thyroid disease or hyperparathyroidism
History of or current pregnancy and oral contraceptive use
History of sleep apnoea

HISTORY

Antihypertensive drug treatment
Current/past antihypertensive medication including effectiveness and intolerance to previous medications
Adherence to therapy

EXAMINATION

Body habitus

Signs of HMOD
Neurological examination and cognitive status
Fundoscopic examination for hypertensive retinopathy
Palpation and auscultation of heart and carotid arteries
Palpation of peripheral arteries
Comparison of BP in both arms (at least once)

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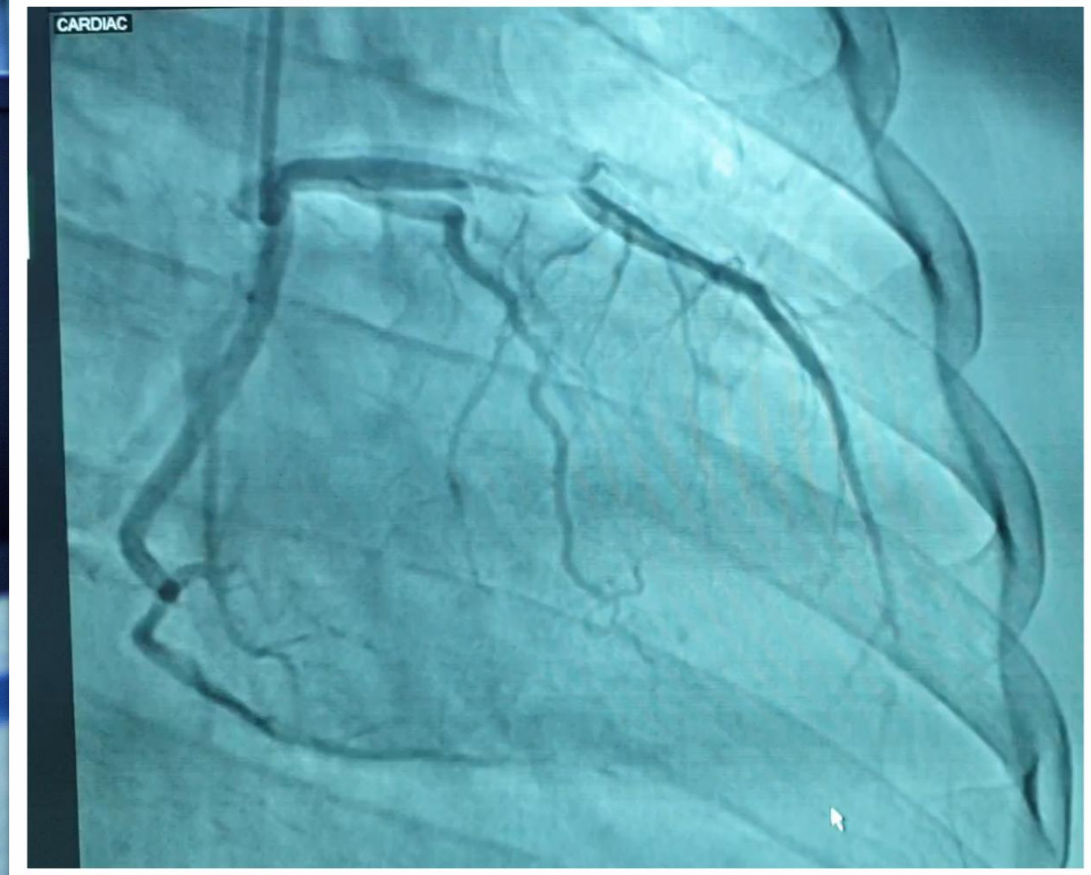
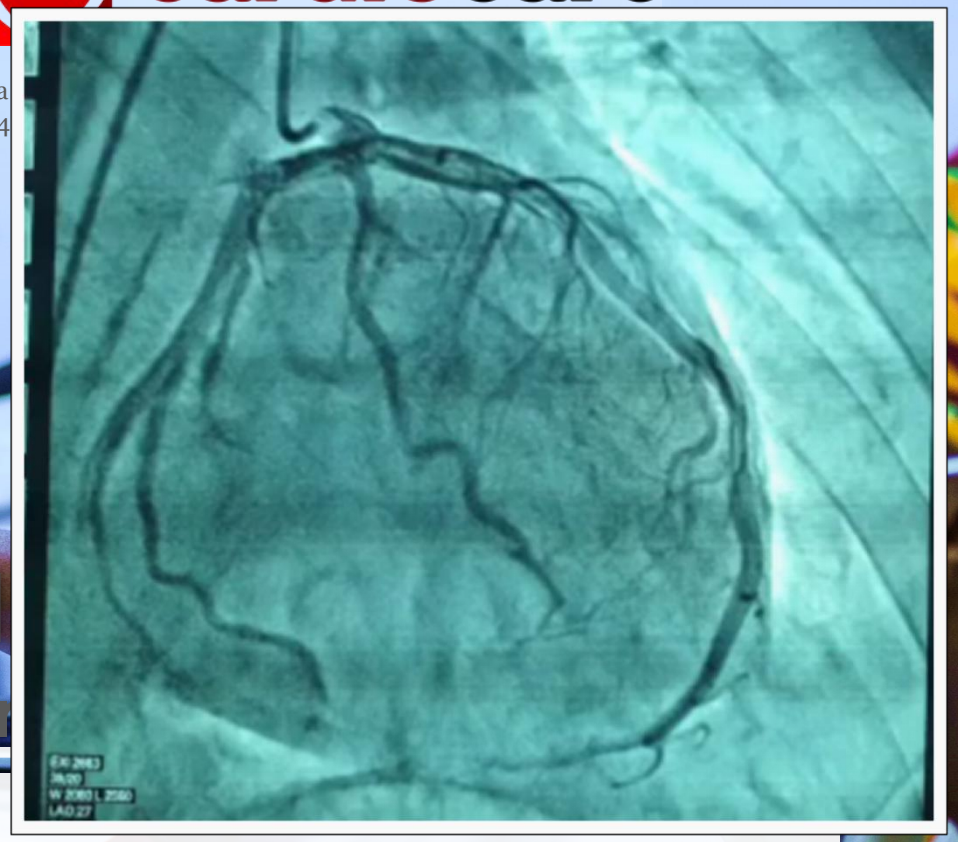
0817 44





For Heart Attacks/Myocardial Infarction, Angina, Ischemic Heart Disease/Failure-

Stents, Balloon Angioplasty, & Chronic Total Occlusions (CTO) of Heart Vessels

EXAMINATION

Secondary hypertension
Skin inspection – cafe-au-lait patches of neurofibromatosis (phaeochromocytoma)
Kidney palpation for signs of renal enlargement in polycystic kidney disease
Auscultation of heart and renal arteries for murmurs or bruits indicative of aortic coarctation or renovascular hypertension
Comparison of radial with femoral pulse – to detect radio-femoral delay in aortic coarctation
Signs of Cushing's disease or acromegaly
Signs of thyroid disease

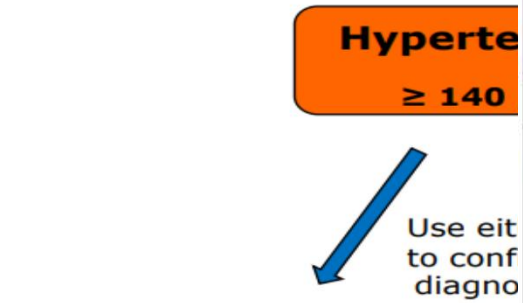
5-Step Approach- DR. ETC

1. **D**iagnose.
2. **R**isk Stratify.
3. **E**ducate.
4. **T**reat to Target.
5. **C**linic Follow up.

STEP 1. DIAGNOSIS

1A. DIAGNOSIS

Screening and diagnosis of hypertension



Recommendations	Class	Level
It is recommended that the diagnosis of hypertension should be based on:		
• Repeated office BP measurements on more than one visit, except when hypertension is severe (e.g. grade 3 and especially in high-risk patients). At each visit, three BP measurements should be recorded, 1–2 min apart, and additional measurements should be performed if the first two readings differ by > 10 mmHg. The patient's BP is the average of the last two BP readings.	I	C
Or		
• Out-of-office BP measurement with ABPM and/or HBPM, provided that these measurements are logistically and economically feasible.	I	C

Williams, Mancia et al., J Hypertens 2018;36:1953-2041 and Eur Heart J 2018;39:3021-3104

Our Experience- Coronary

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Reversing Medical Tourism

- The predominant procedures
  - 233 (51.3%) diagnostic coronar
  - 90 (19.8%) percutaneous interv

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1B. HYPERTENSION: CLINIC DIAGNOSIS

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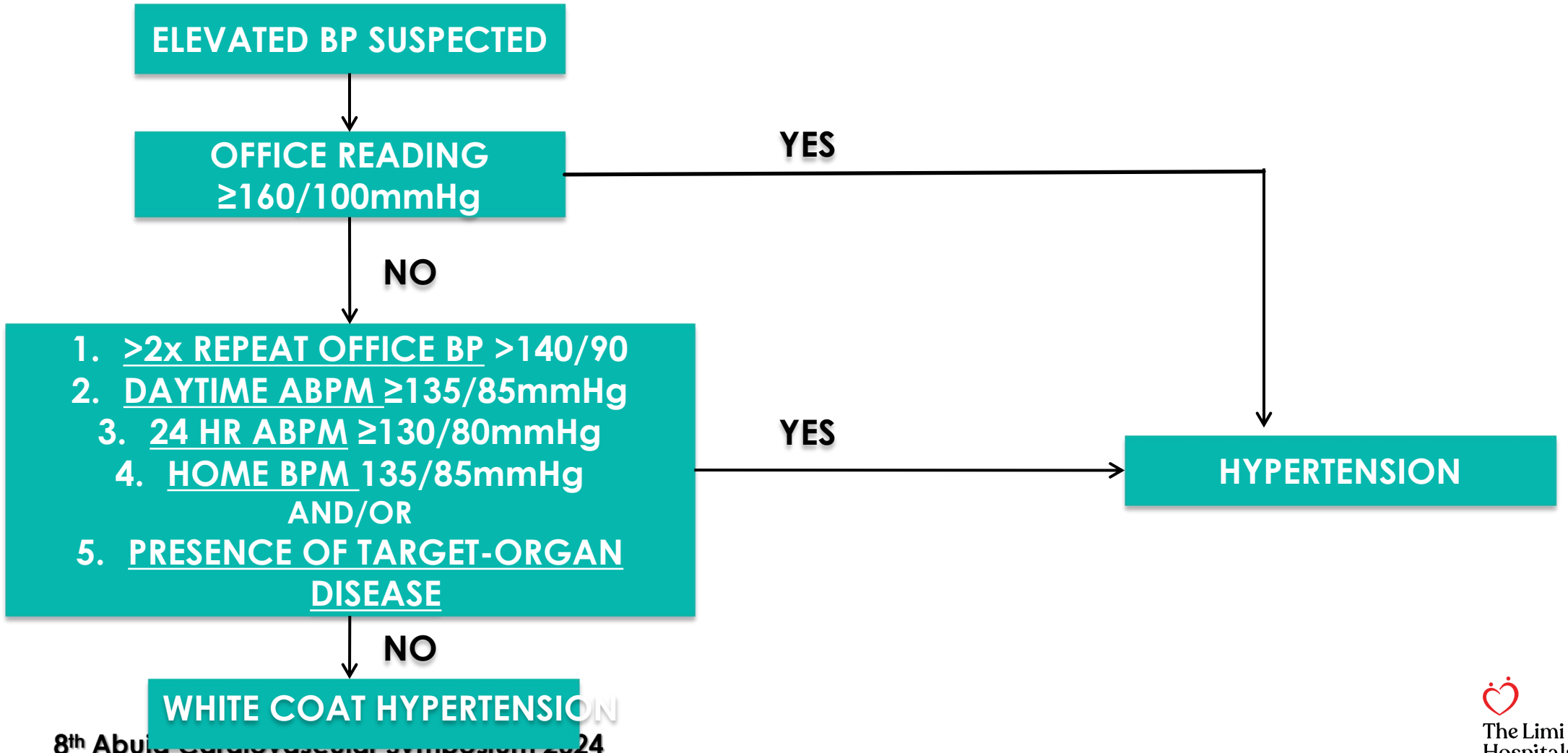

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1C. DIAGNOSIS

Recommendations	Class	Level
It is recommended that the diagnosis of hypertension should be based on:		
• Repeated office BP measurements on more than one visit, except when hypertension is severe (e.g. grade 3 and especially in high-risk patients). At each visit, three BP measurements should be recorded, 1–2 min apart, and additional measurements should be performed if the first two readings differ by > 10 mmHg. The patient's BP is the average of the last two BP readings.	I	C
Or		
• Out-of-office BP measurement with ABPM and/or HBPM, provided that these measurements are logistically and economically feasible.	I	C

ESC European Society of Cardiology

Williams, Mancia et al., J Hypertens 2018;36:1953-2041 and Eur Heart J 2018;39:3021-3104

European Society of Hypertension

5-Step Approach- DR. ETC

1. **D**iagnose.
2. **R**isk Stratify.
3. **E**ducate.
4. **T**reat to Target.
5. **C**linic Follow up.

Our Experience- Coronary

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- The predominant procedures
  - 233 (51.3%) diagnostic coronar
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STEP 2. Risk Stratification?

2A. Why Investigate?

1. Find and alleviate Target Organ Damage/Hypertension Mediated Organ Damage- **HMOD** *(Hypertension Mediated Organ Dysfunction).*
   - *ECG, Echocardiography, Kidney Function, Lipids, Glycemic Profile, Uric Acid, History, Examination*
   - *Confirm/Exclude Established Cardiovascular Disease and Secondary Causes.*
2. **Risk stratification**
3. Identify other cardiovascular risk factors
4. Exclude secondary hypertension
5. Compelling Indications for certain drug therapy

2B. How to Investigate?

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First Line (FOR ALL)

- Urinalysis
- Serum Creatinine, Urea & Electrolytes, Uric Acid
- FBS, and/or HbA1C
- Lipid profile
- PCV or Full Blood count
- ECG- Electrocardiography
- Echocardiography and/or CXR
- Body Mass index

Second Line (FOR SOME)

- Renal Artery Doppler +/- abdominal ultrasound
- Uric Acid
- Renin Levels
- 24hr Ambulatory Blood Pressure
- Thyroid function tests
- Urine microscopy
- Cortisol Screening

Peripheral Angioplasty and Intervention

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Modern Treatment Under One Roof

For Peripheral Arterial Disease- to reduce tissue loss and gangrene especially lower limb

Stenting, Balloon Angioplasty, Thrombosuction, Catheter-Directed Thrombolytic Therapy (CDTT)

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2C. Risk Assessment

Elevated Blood Pressure confirmed (2 office readings with standard approach)
+/- Ambulatory Blood Pressure in high normal or suspected Masked HTN or Control of Very High Risk on Meds

ASCVD Score + Hypertension Mediated/Associated Organ Dysfunction (HMOD) Surveillance
ECG, Echocardiography, Kidney Function, Lipids, Glycemic Profile, Uric Acid, Confirm/Exclude Established Cardiovascular Disease and Secondary Causes.

EDUCATION, LIFESTYLE TREATMENT AND RISK MODIFICATION FOR ALL!
Diet, Weight Control, Salt Reduction, Exercise, Stop Smoking/Excessive Alcohol, Follow up adherence, Treat Co-Morbidities

	Other Risk Factors or HMOD	High Normal Blood Pressure	Grade 1	Grade 2	Grade 3
Stage 1 (No HMOD)	*No other risk factor*	Low	Low	Moderate	High
	1 or 2 risk factors	Low	Moderate	Moderate-to-High	High
	3 or more risk factors	Low –to-Moderate Treat Risk	Moderate-to-High	High	High
Stage 2 (Asymptomatic)	*HMOD, CKD Grade 3, or DM without Organ Damage*	Moderate-to-High	High	High	High-to-Very High
Stage 3 (Established)	*Established CVD, CKD > Grade 4, or DM with*	Very High	Very High	Very High	Very High

2D. Hypertension Mediated Organ Damage (HMOD)

- Left Ventricular Hypertrophy- ECG/ECHO
- Microalbuminuria
- Proteinuria
- eGFR 30-59 ml/min
- Radiologic or Ultrasound evidence of atherosclerotic plaques
- Retinal Hemorrhages or exudates by fundoscopy

RISK STRATIFICATION CASE STUDY EXERCISE

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- 49year old man presented in OPD with no complains. Had cough and went to a pharmacy were is BP was checked and told it was 170/100mmhg. Not a known hypertensive or diabetic. Has a family history of hypertension in both parents
- O/E Obese, not pale, anicteric, acyanosed, nil pedal oedema
- CVS PR 84bpm, normal vol, regular
- BP 150/90mmhg
- HS S1S2
- IVS- Urinalysis +pr
- E,U,Cr normal

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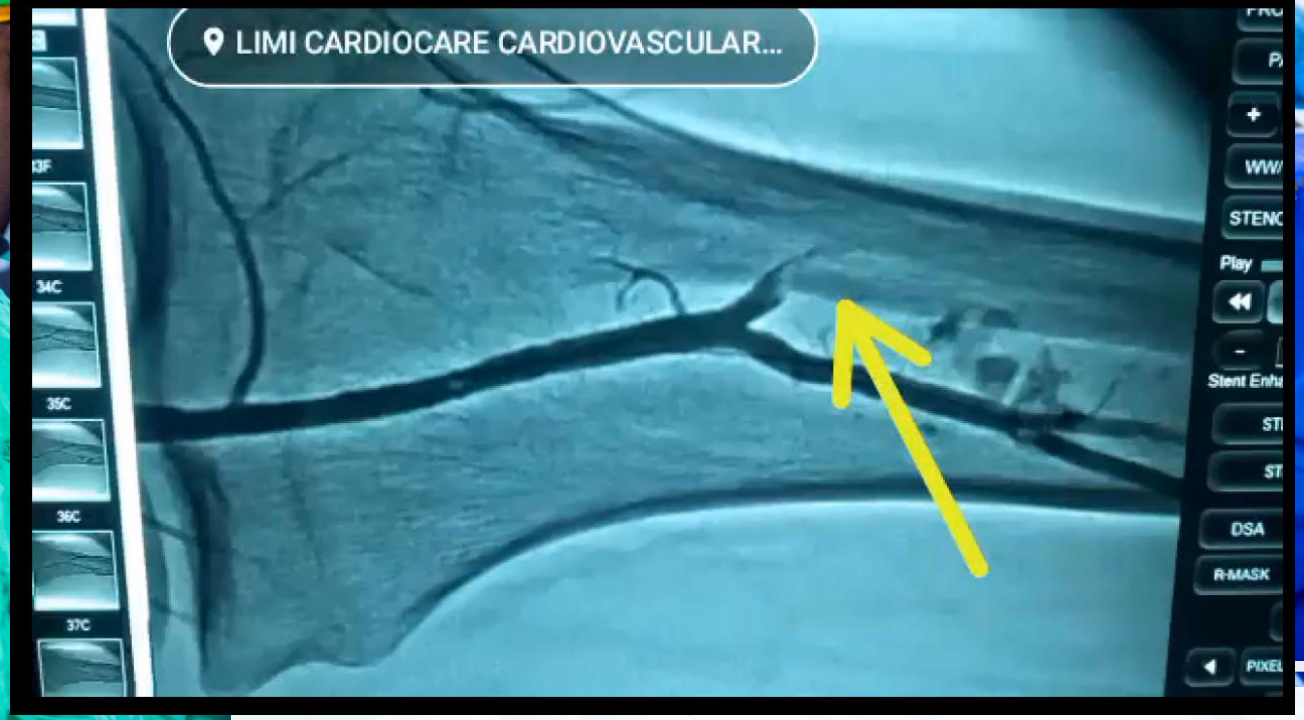

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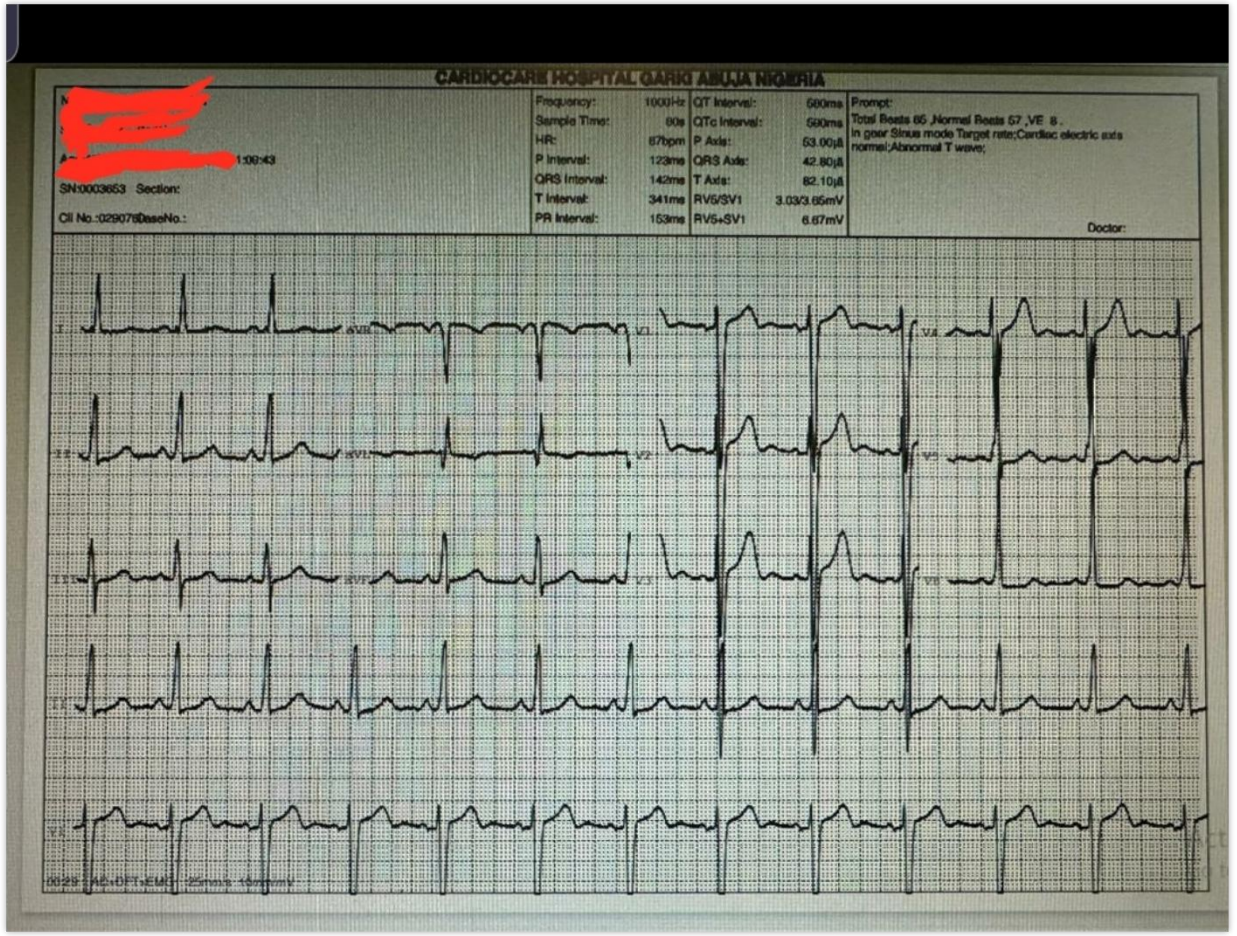
CARDIOCARE HOSPITAL GARKI ABUJA NIGERIA
Frequency: 1000Hz
Sample Time: 80s
HR: 87bpm
P Interval: 123ms
QRS Interval: 142ms
T Interval: 341ms
PR Interval: 153ms
QT Interval: 580ms
QTc Interval: 590ms
P Axis: 53.00°
QRS Axis: 42.80°
T Axis: 82.10°
RV5/SV1 3.03/3.65mV
RV5+SV1 6.67mV
Prompt:
Doctor:

- How do we do next?
- A) Lifestyle modification
- B) Cardiovascular profile and ABPM
- C) Give Aldomet and Metoprolol
- D) Start ACEi/ARBs
- E) weight loss and repeat BP in 4/52

5-Step Approach- DR. ETC

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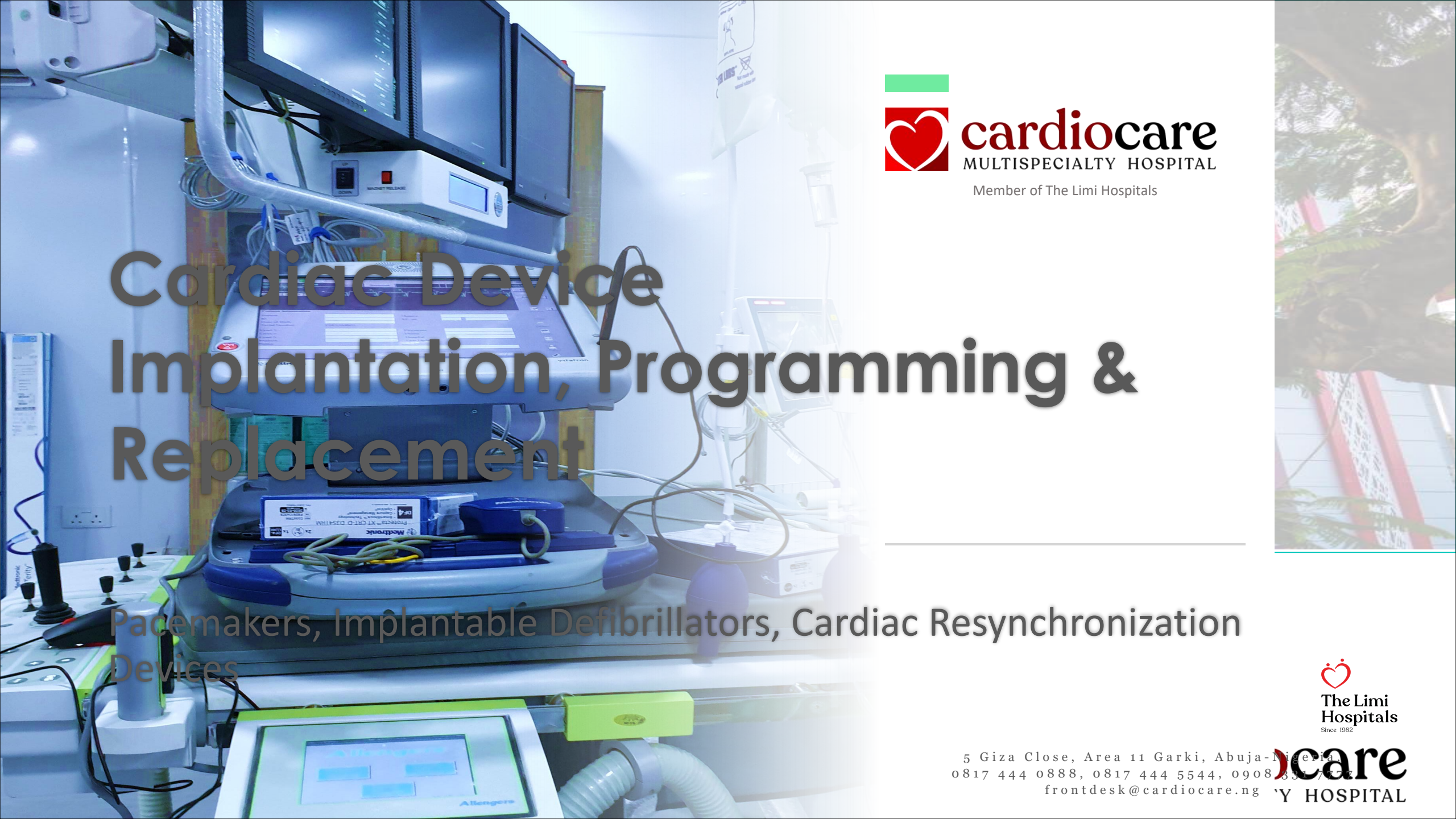
1. **D**iagnose.
2. **R**isk Stratify.
3. **E**ducate.
4. **T**reat to Target.
5. **C**linic Follow up.



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Cardiac Device Implantation, Programming & Replacement

Pacemakers, Implantable Defibrillators, Cardiac Resynchronization Devices

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STEP 3. Education

The Most Important Component and Bedrock of Hypertension Treatment in Nigeria is _____

EDUCATION, EDUCATION, EDUCATION!!!

3. Education

- Disease nature
- Cardiovascular Disease
- Risk Profile
- Investigations
- Hypertension-Mediated/Associated Organ Damager (HMOD)
- Diet
- Salt Intake
- Lifestyle Modifications

5-Step Approach- DR. ETC

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1. **D**iagnose.
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Our Experience- Cardiac Devices

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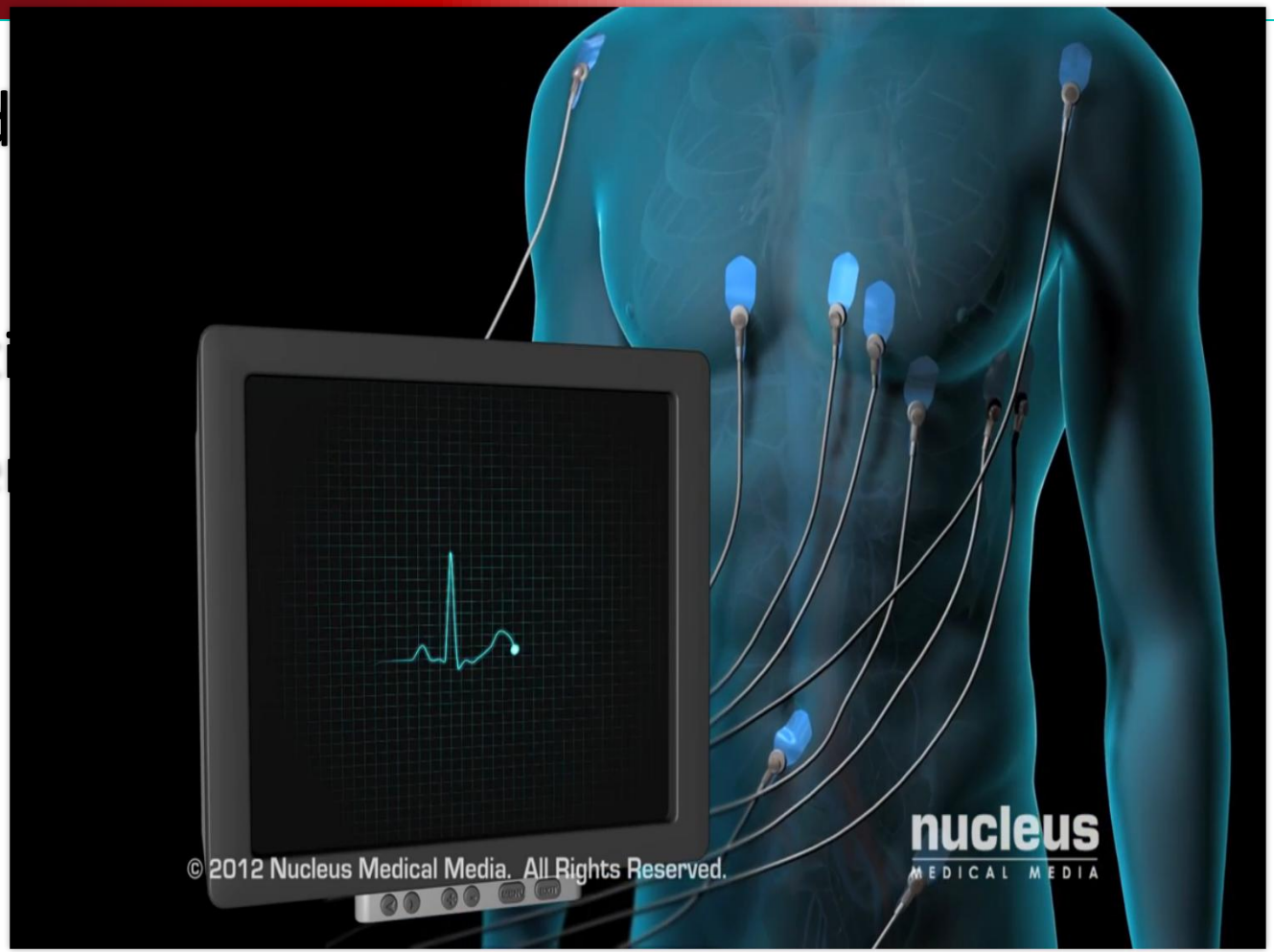

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STEP 4. Treat to Target

Don't Just Treat

4. Treat to Target- Don't just Treat!

Age group	Office SBP treatment target ranges (mmHg)					Office DBP treatment target range (mmHg)
	Hypertension	+ Diabetes	+ CKD	+ CAD	+ Stroke[a]/TIA	
18 - 65 years	**Target to 130** *or lower if tolerated* Not <120	**Target to 130** *or lower if tolerated* Not <120	**Target to <140 to 130** *if tolerated*	**Target to 130** *or lower if tolerated* Not <120	**Target to 130** *or lower if tolerated* Not <120	70–79
65 - 79 years[b]	**Target to 130-139** *if tolerated*	**Target to 130-139** *if tolerated*	**Target to 130-139** *if tolerated*	**Target to 130-139** *if tolerated*	**Target to 130-139** *if tolerated*	70–79
≥80 years[b]	**Target to 130-139** *if tolerated*	**Target to 130-139** *if tolerated*	**Target to 130-139** *if tolerated*	**Target to 130-139** *if tolerated*	**Target to 130-139** *if tolerated*	70–79
Office DBP treatment target range (mmHg)	70–79	70–79	70–79	70–79	70–79	

CAD = coronary artery disease; CKD = chronic kidney disease (includes diabetic and non-diabetic CKD); DBP = diastolic blood pressure; SBP = systolic blood pressure; TIA = transient ischaemic attack.

[a]Refers to patients with previous stroke and does not refer to blood pressure targets immediately after acute stroke.

[b]Treatment decisions and blood pressure targets may need to be modified in older patients who are frail and independent.

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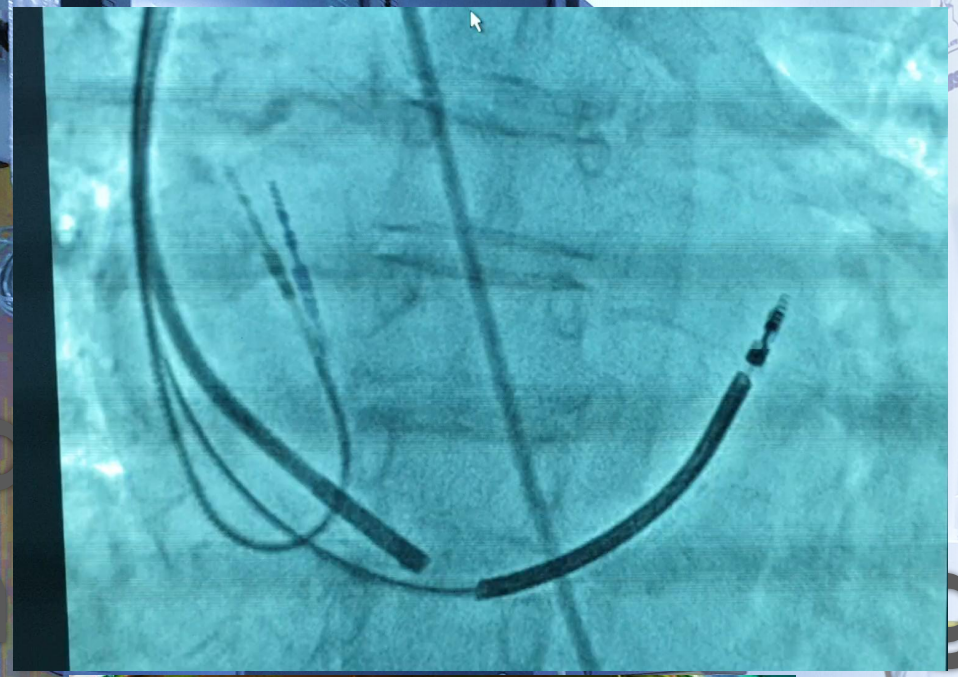

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4.1 Lifestyle modification

- Lifestyle changes is still the *cc*
- Low sodium diet
- Weight loss
- Healthy eating
- Exercise
- Alcohol/ Smoking

- Reducing salt intake (to less than 5g daily).
- Eating more fruit and vegetables.
- Being physically active on a regular basis.
- Avoiding use of tobacco.
- Reducing alcohol consumption.
- Limiting the intake of foods high in saturated fats.
- Eliminating/reducing trans fats in diet.

4.2 Starting Pharmacologic Treatment?

	HIGH NORMAL (130-139/85-89)	GRADE 1 WITH LOW TO MODERATE RISK (140-159/90-99)	GRADE 1 WITH HIGH OR VERY HIGH RISK (140-159/90-99)	GRADE 2 HYPERTENSION (160-179/100-109)	GRADE 3 HYPERTENSION (≥180/110)
LIFESTYLE TREATMENT	YES				
DRUG THERAPY	NOT YET EXCEPT IN VERY HIGH RISK WITH CVD ESP CAD	DRUG TREATMENT IF NO CONTROL AFTER 3-6MONTHS OF LIFESTLYE	DRUG TREATMENT ESP IF CVD, RENAL DISEASE OR HMOD	IMMEDIATE DRUG TREATMENT IN ALL PATIENTS	
TARGET BLOOD PRESSURE	AIM FOR <130/70-79 systolic within 3 months Consider ABPM in high and very risk patients				

ESC European Society of Cardiology

Williams, Mancia et al., J Hypertens 2018;36:1953-2041 and Eur Heart J 2018;39:3021-3104

ESH European Society of Hypertension

4.3 Preferred/Compelling Drug Choice in Hypertension

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Cardiac Disease	
Left Ventricular Hypertrophy/Dysfunction	ACEI, ARB, β -blocker
Heart Failure	ACEI, ARB, β –blocker, MRA
Angina/Ischaemic Heart Disease	β –blocker, CCB
Stroke	CCB, diuretic, ACEI.
Nephropathy	ACEI, ARB, diuretic
Diabetes	ACEI, ARB, thiazide-like diuretic, CCB.
Elderly	Diuretic, CCB.
Pregnancy	a-methyldopa, CCB(Nifedipine), Labetalol, hydralazine

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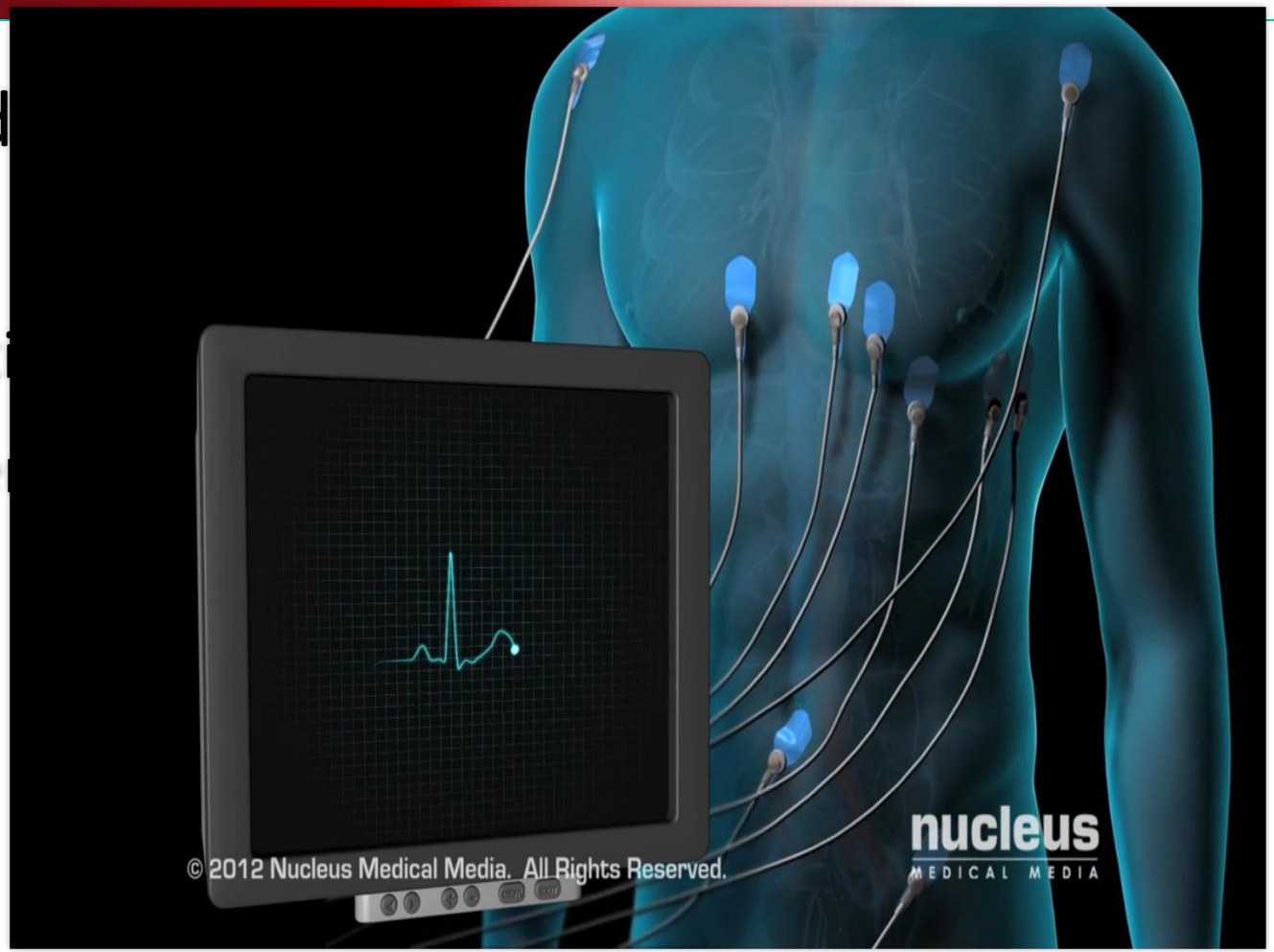

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Compelling and possible contraindications to the use of specific antihypertensive drugs

Drug	Contraindications	
	Compelling	Possible
Diuretics (thiazides/thiazide-type, e.g. chlorthalidone and indapamide)	• Gout	• Metabolic syndrome • Glucose intolerance • Pregnancy • Hypercalcemia • Hypokalemia
Beta-blockers	• Asthma • Any high-grade sino-atrial or atrioventricular block • Bradycardia (heart rate < 60 beats per min)	• Metabolic syndrome • Glucose intolerance • Athletes and physically active patients
Calcium antagonists (dihydropyridines)		• Tachyarrhythmia • Heart failure (HFrEF, class III or IV) • Pre-existing severe leg oedema
Calcium antagonists (verapamil, diltiazem)	• Any high-grade sino-atrial or AV block • Severe LV dysfunction (LV EF < 40%) • Bradycardia (heart rate < 60 beats per min)	• Constipation
ACE inhibitors	• Pregnancy • Previous angioneurotic oedema • Hyperkalemia (potassium > 5.5 mmol/L) • Bilateral renal artery stenosis	• Women of child-bearing potential without reliable contraception
ARBs	• Pregnancy • Hyperkalemia (potassium > 5.5 mmol/L) • Bilateral renal artery stenosis	• Women of child-bearing potential without reliable contraception

4.4 Escalation of Drugs

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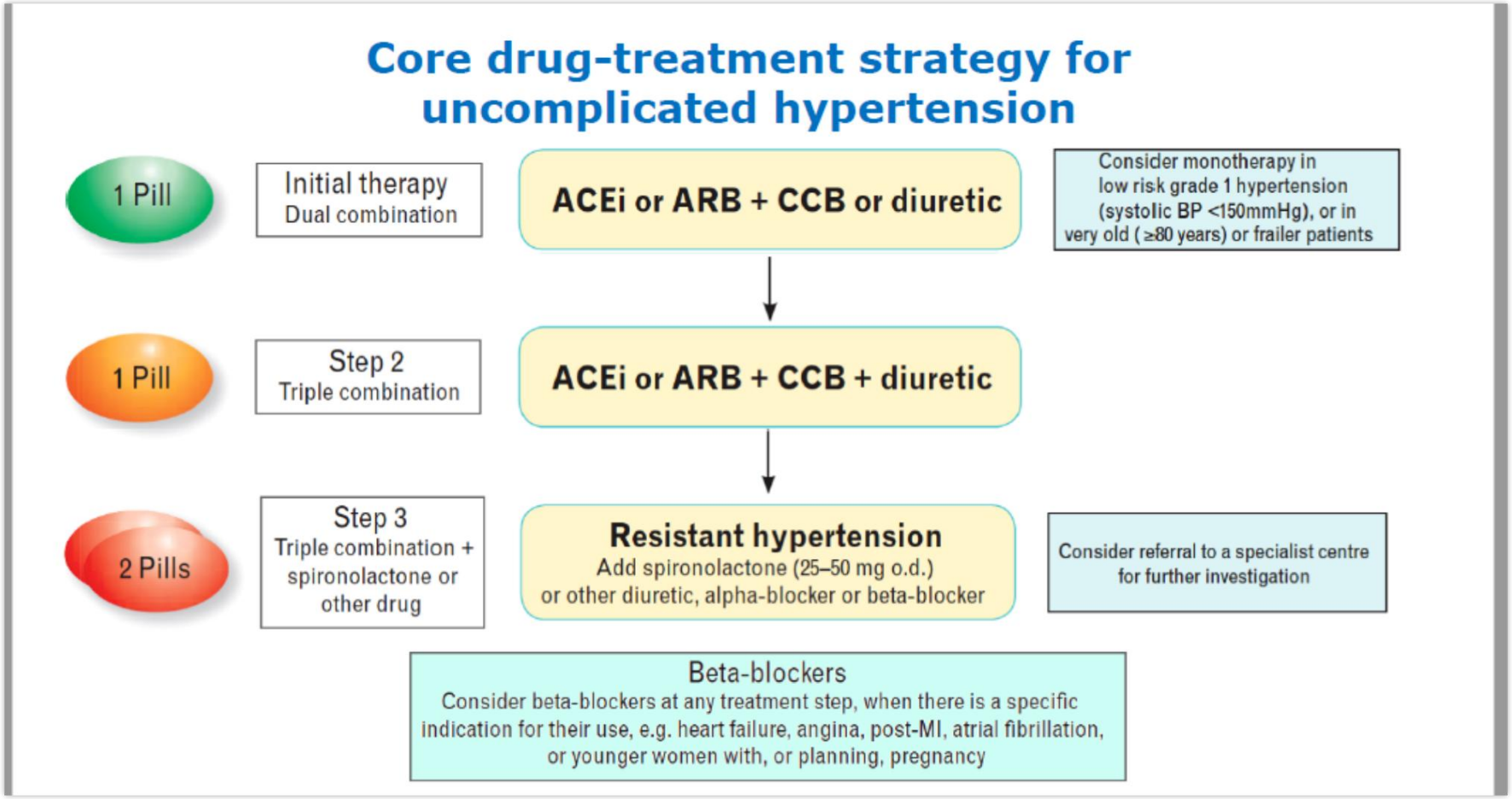

4.3 Escalation of Drugs in Hypertension:

Start Low, Combine, then Increase till Target

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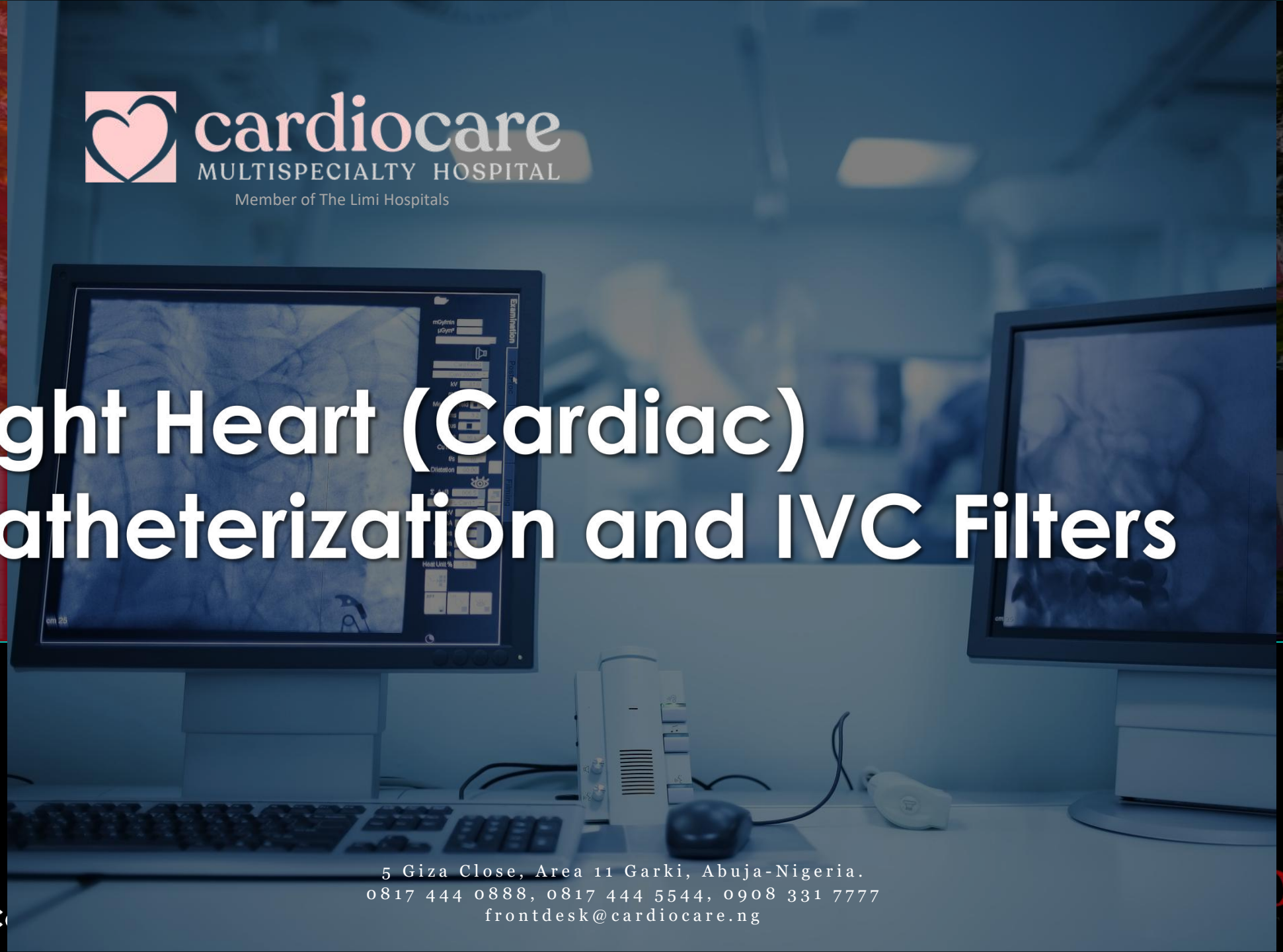
STEP 1 <160/100	A	B	C	D
STEP 2 >160/100	A + C	A + D	A + B	
STEP 3		A + C + D		
STEP 4		A + C + D + X		

- **A**= ACEi OR ARB
- **B**= BETA BLOCKERS
- **C**= CALCIUM CHANNEL
- **D**= DIURETICS
- **X**= FURTHER DIURETICS, ALDOSTERONE ANTAGONISTS or ALPHA BLOCKER



Right Heart (Cardiac) Catheterization and IVC Filters

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4.8 Escalation of Drugs in Hypertension:

Start Low dose, Combine and then Increase Dose

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- **Step 1:**
  - People aged <55: initial therapy with an ACE-I/ARB. Or CCB+ACEIARB combination
  - People aged >55: initial therapy with a CCB.
  - *Black patients (any age): CCB or Thiazide-like Diuretic is preferred*
  - And Follow Compelling Indication
- **Step 2:**
  - Add ACE-I (or low-cost ARB) to CCB (or vice versa) or *Thiazide-like* Diuretics.
- **Step 3:**
  - Before considering step 3 treatment, ensure step 2 treatment is at optimal, or best tolerated dose.
  - Add Other agents including aldosterone antagonists
  - Look for uncontrolled risk and precipitators

4.7 Aspirin and statins

- Consider prescribing other drugs that modify CV risk.
- **Aspirin 75mg od:**
  - Reserved for ONLY secondary prevention of CV disease.
  - BUT Occasionally, primary prevention in hypertensives with 10-year CV risk > 20% and BP <150/90mmHg, with no contraindication.
- **Statin therapy:**
  - primary prevention in hypertensives with 1
  - secondary prevention in all with overt CV di
    cholesterol or LDL.
  - Targets (whichever is the greatest reductior
    - reduction in total cholesterol by 25% or
    - LDL cholesterol by 30%, or

Recommendations	Class	Level
Antiplatelet therapy, in particular low-dose aspirin, is recommended for secondary prevention in hypertensive patients.	I	A
Aspirin is not recommended for primary prevention in hypertensive patients without CVD.	III	A

5-Step Approach- DR. ETC

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Indications for permanent pacing

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- In bradycardia caused by reversible etiologies, permanent pacing is not warranted.
- The **indication for pacing is based on the severity of bradycardia** rather than its etiology.
- Symptomatic sinus bradycardia as a result of medical therapy is an indication for permanent pacing if there are no alternative treatment options.
- Typically from:
  1. Sinus Node Dysfunction
  2. AV Block

Step 5. Clinic Follow Up

5.1 Follow up

1. **Follow Up for Life**
2. **Home BP Monitoring**
3. **Yearly Organ Function (HMOD) Survey**
4. **Low CV Risk may be managed in primary care settings**
5. **Intervals**
   - 1-4 weekly follow up till target is reached
   - 3-4 monthly follow up once target is reached .

5.2 What to Do at Follow Up

- Re-education
- Review of adherence & possible side effects
- Surveillance for Established Cardiovascular Disease Complications
  - Edema, Chest Pain, TIA, Claudication, etc
- Review of other CV risk-
  - DM, Uric Acid, Peripheral Artery Disease, Lipids, Proteinuria, etc.
- Review of HMOD once yearly
- Adjust of medications to target

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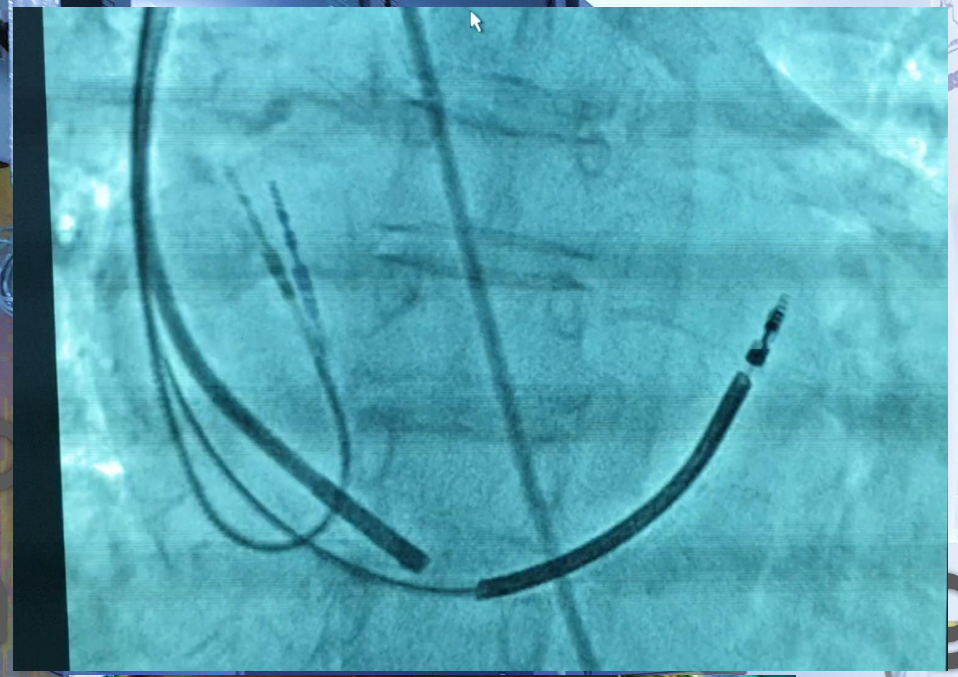

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5.3 General Follow Up Targets

1. **BMI**
   - <30
2. **Blood Pressure**
   - <125/75 if DM + Proteinuria
   - <130/80 if other HMOD
   - <140/90 if no HMOD or other risk factor
3. **Pulse**
   - 60-90 typically
   - 55-70 if Heart Failure or Ischemic Heart Disease , CVD, Investigations as appropriate

HYPERTENSION IN SPECIAL SITUATIONS

6. Hypertensive Crises

Our Experience- Cardiac Devices

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Reversing Medical Tourism

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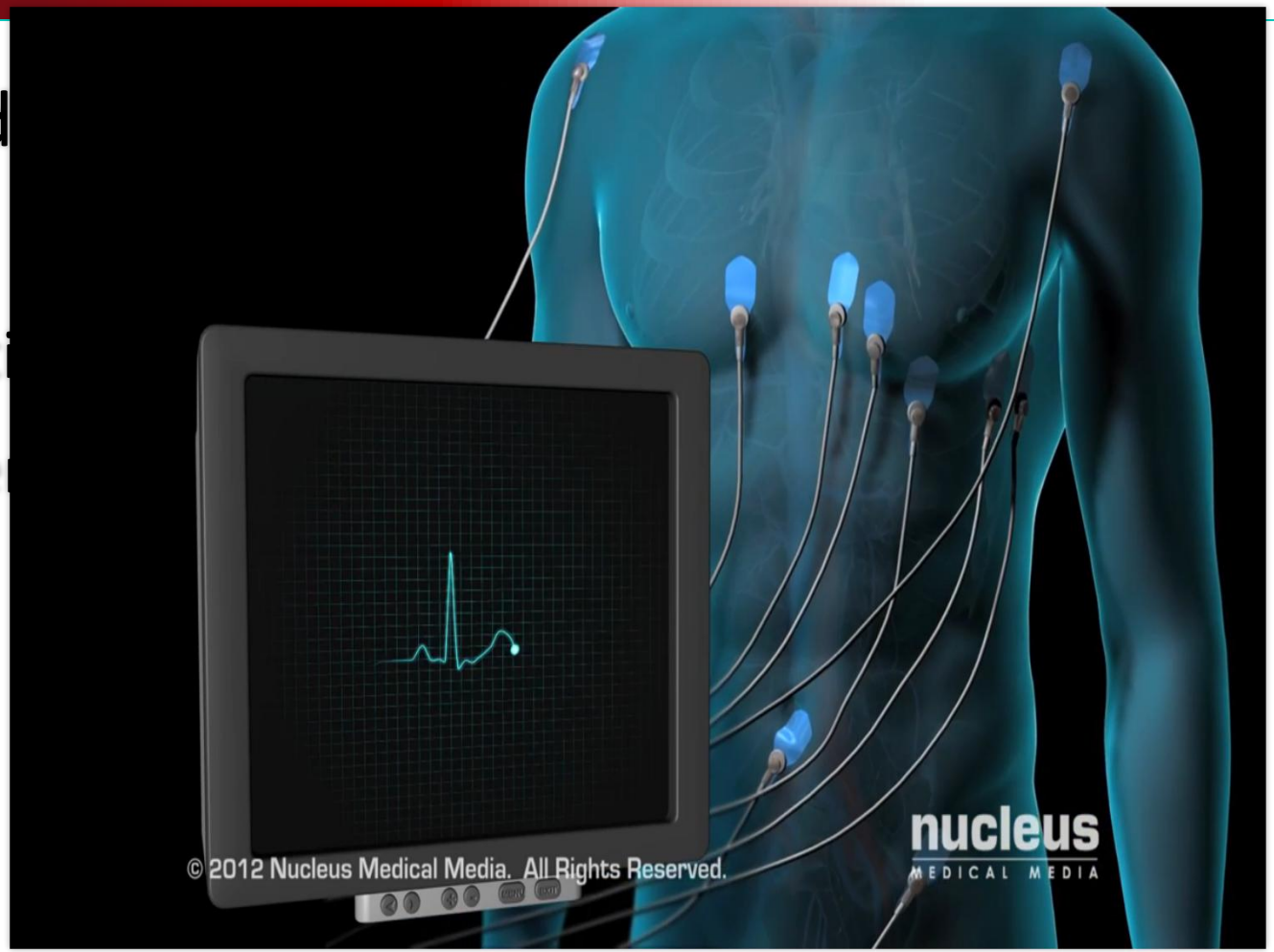

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6.1 HYPERTENSIVE CRISIS

- Hypertensive crises are **ACUTE, SEVERE ELEVATIONS IN BLOOD PRESSURE** typically above 180/110 mmHg
  - +/- acute/new, on-going, hypertension-mediated, target-organ damage target-organ dysfunction.

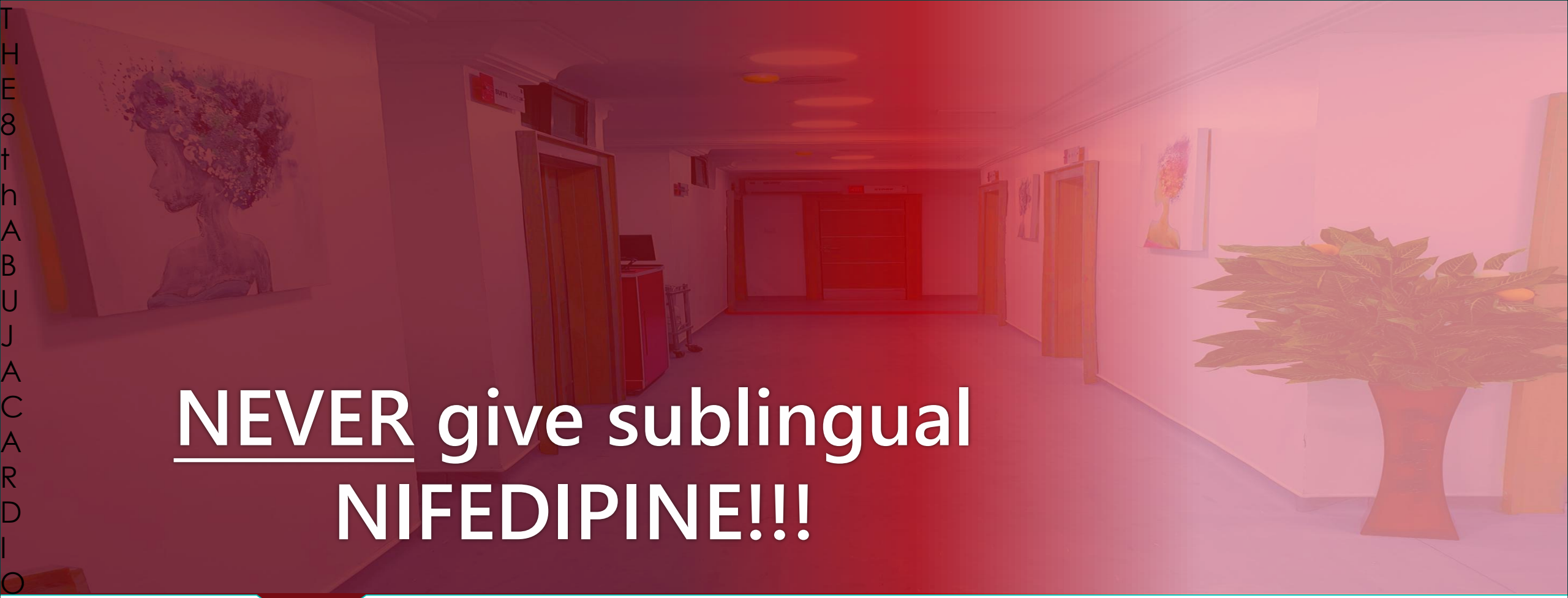
A. HYPERTENSIVE URGENCY:

- ABSENCE OF acute/new, on-going, hypertension-mediated, target-organ damage target-organ dysfunction

B. HYPERTENSIVE EMERGENCY:

- PRESENCE OF acute/new, on-going, hypertension-mediated, target-organ damage target-organ dysfunction

- *Hypertensive urgency is two to three times more common than hypertensive emergency*



NEVER give sublingual NIFEDIPINE!!!

INSTANTLY CRASHING DOWN BLOOD PRESSURE THAT WAS VERY HIGH IS ALMOST ALWAYS A BAD IDEA!!!

EXCEPT IN VERY FEW CIRCUMSTANCES

Hypertensive crisis

Are there findings of acute target organ damage?

- **Brain (Stroke, ICH)**
- **Retina (Hemorrhages, papilledema)**
- **Heart (ACS-chest pain & ADHF or Pul Edema)**
- **Kidneys (AKI)**

No

Confirm persistent elevation despite 20 – 30mins of rest

Symptoms attributable to high blood pressure?

No

Urgency

- **Adjust long-acting medication.**
- **Follow-up in 1-7 days**

Yes

Urgency

- **TREAT any pain or full bladder**
- **Give "rapid" oral agent**
- **Adjust long-acting medications**
- **Discharge when symptoms have improved and blood pressure is <180/110mm Hg**
- **Follow-up in 1-7days**

Yes

Emergency

- Admit to ICU
- Start IV treatment immediately
- Select drug according to indication
- Lower blood pressure according to pattern of organ injury
- STart or resume long acting medication during first 6-12 hrs of treatment
- Reach target by 48 hrs

Our Experience- Cardiac Devices

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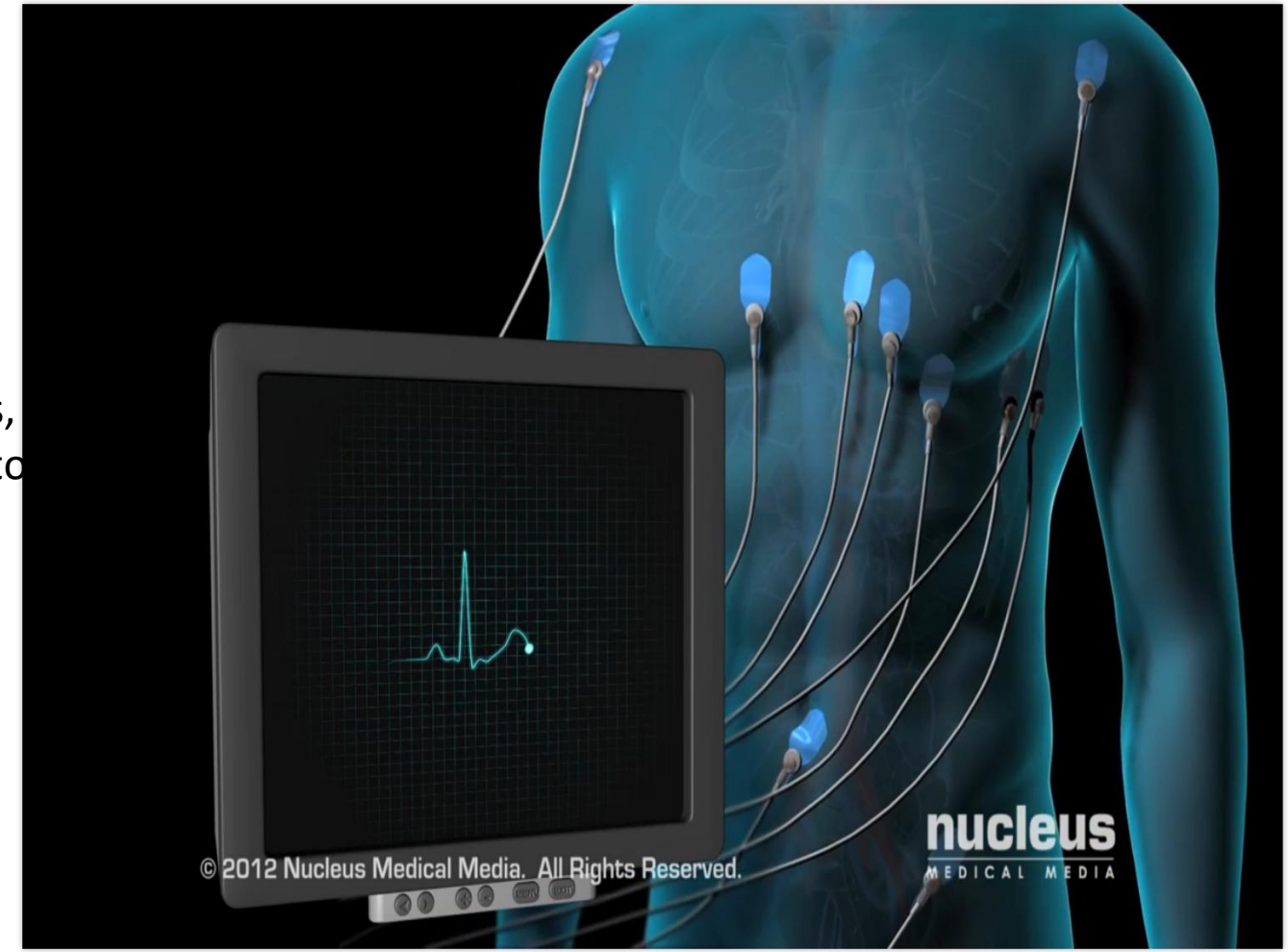
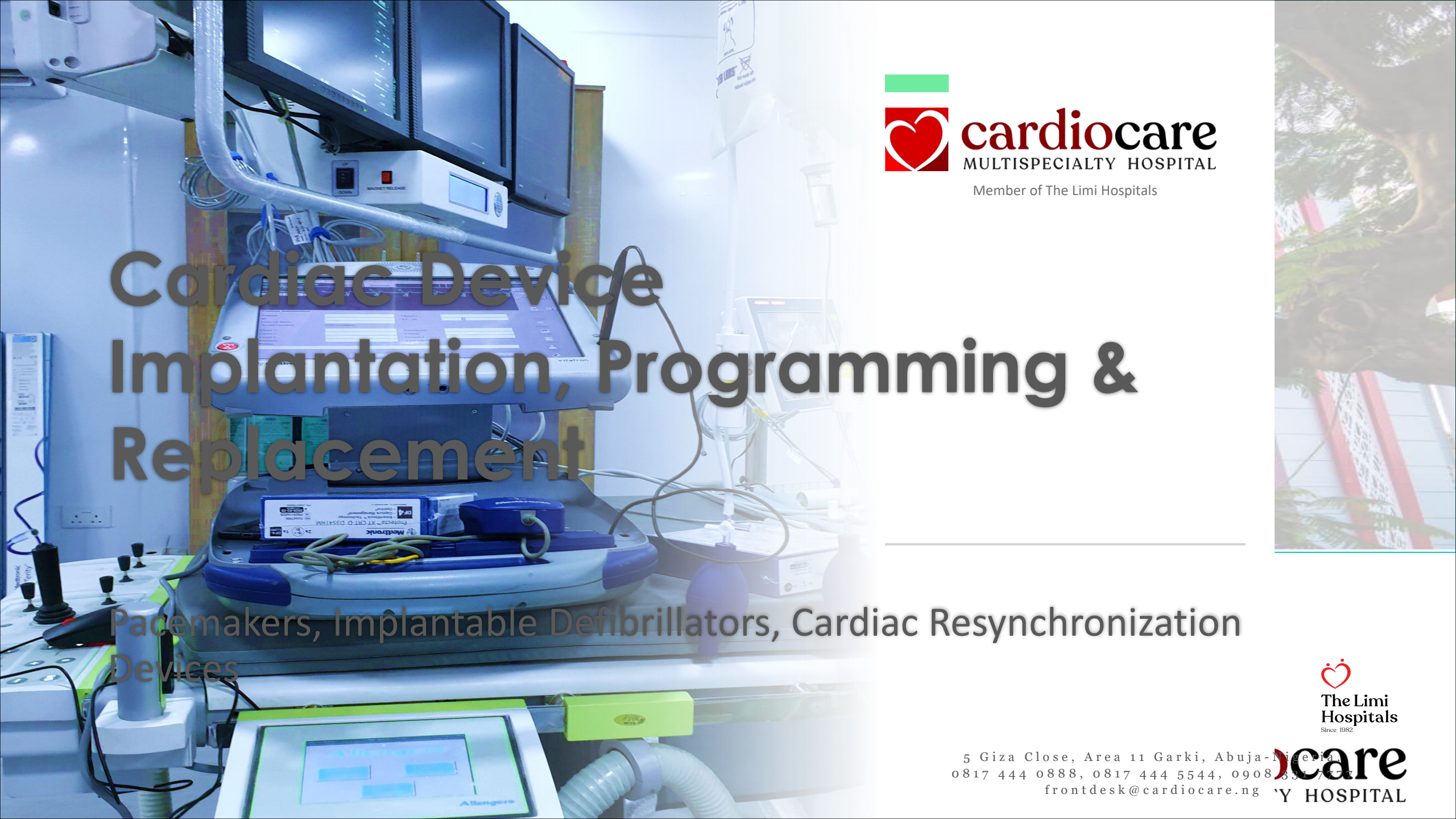


6.2 BP Treatment Goals for Hypertensive Emergency

Goal Time[a]	BP Target
First hour	Reduce MAP by 25% (while maintaining goal DBP ≥ 100 mm Hg)
Hours 2–6	SBP 160 mm Hg and/or DBP 100–110 mm Hg
Hours 6–24	Maintain goal for hours 2–6 during first 24 hr
24–48 hr	Outpatient BP goals according to the 2017 Guidelines for Management of High Blood Pressure in Adults

6.3 Ideal drugs for Emergencies

- Rapid onset
- Short acting
- Predictable BP lowering effect- no precipitous fall in BP



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6.4 Hypertensive Emergency Drug Treatments-1

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Emergency	First Line	AVOID!!!	***Caveat***
Hypertensive Encephalopathy	• Nitroprusside 0.25-10 ug/kg/min • Labetalol 20-80mg IV bolus every 10mins, 0.5-2 mg/min • Nicardipine 5-15 mg/hr	• Clonidine • Trimetophan • **NSAIDs**	• **MUST rule out Strokes**

Cerebral Infarction or Hemorrhage (Stroke)	• Labetalol 20-80mg IV bolus every 10mins, 0.5-2 mg/min
	• Nitroprusside 0.25-10 ug/kg/min
	• Nicardipine 5-15 mg/hr
		• **Avoid Hydralazine**	• Don't treat to Normal
			• Avoid Decreased Cerebral Perfusion
			• Treat Cerebral Edema first
			• Then Treat ONLY if BP:
			  • >220/120 (no thrombolytics)
			  • >185/110 (thrombolytics)

Eclampsia	• Labetalol 20-80mg IV bolus every 10mins, 0.5-2 mg/min • Nicardipine 5-15 mg/hr • Magnesium 6g loading dose, then 2g/hr	• **Avoid Enalaprilat** • **Avoid Nitroprusside**	• Consider Emergent delivery

6.4 Hypertensive Emergency Drug Treatments-2

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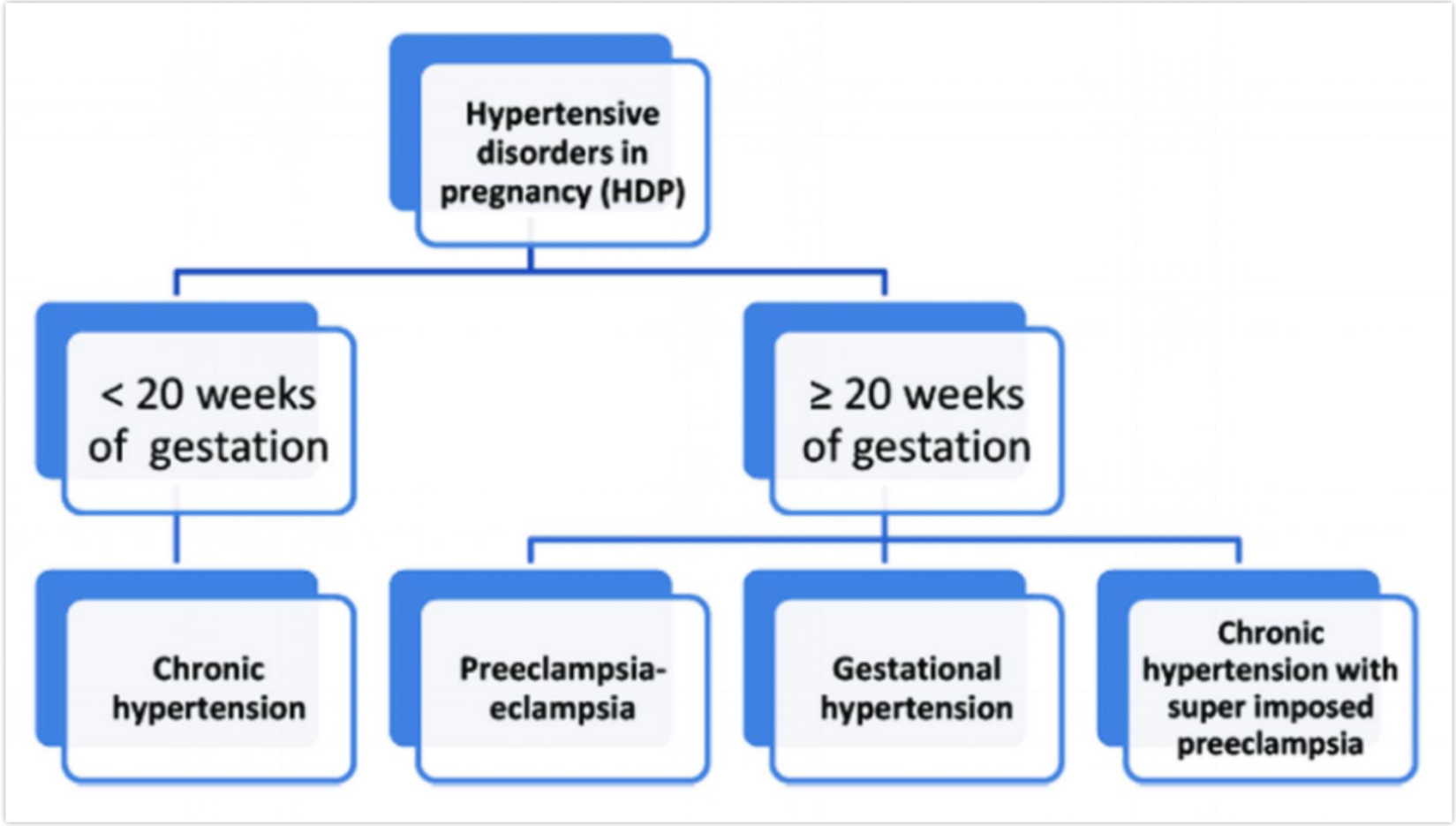
Emergency	First Line	AVOID!!!	***Caveat***
Acute Myocardial Infarction	• Nitroglycerin 5-100 ug/min • Labetalol 20-80mg IV bolus every 10mins, 0.5-2 mg/min • Nitroprusside 0.25-10 ug/kg/min	• **AVOID Hydralazine**	• Increase coronary perfusion • Decrease afterload
Acute Left Ventricular Failure/Pulmonary Edema	• Nitroglycerin 5-100 ug/min • Nitroprusside 0.25-10 ug/kg/min • Enaprilat 1.25-5mg every 6hours • (+ Diuresis)	• **AVOID Labetalol**	• Decrease Afterload
Aortic Dissection	• Labetalol 20-80mg IV bolus every 10mins, 0.5-2 mg/min • Nitroprusside 0.25-10 ug/kg/min	• **Avoid Hydralazine**	• Decrease dP/dT shearing forces
Catecholamine Excess	• Phentolamine 5-10mg/min • Labetalol 20-80mg IV bolus every 10mins, 0.5-2 mg/min • Nitroprusside 0.25-10 ug/kg/min		• Avoid unopposed Beta Blocker • Consider benzodiazepines for cocaine toxicity

7. Hypertension in Pregnancy

7.1 Classification of Hypertensive Disorders In Pregnancy



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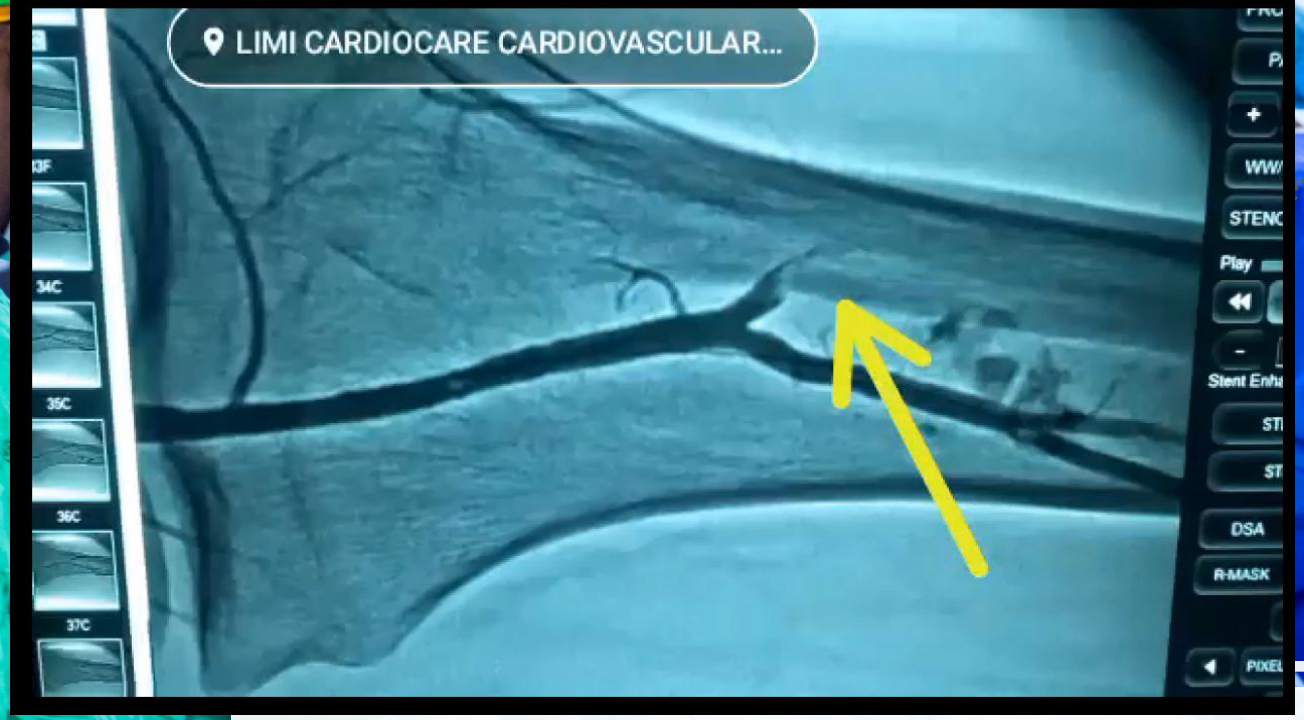

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7.2 Hypertension in Pregnancy: Treatment cut-off

- Regardless of the hypertensive disorder of pregnancy, BPs consistently at or >140/90 mm Hg in clinic or office (or ≥135/85 mm Hg at home) should be treated
- BP requires urgent treatment in a monitored setting when severe (>160/110 mm Hg);

7.3 Safe medications in Pregnancy

- Methyldopa
- Labetalol
- Nifedipine
- Second- or third-line agents include Hydralazine and Prazosin

Emergency

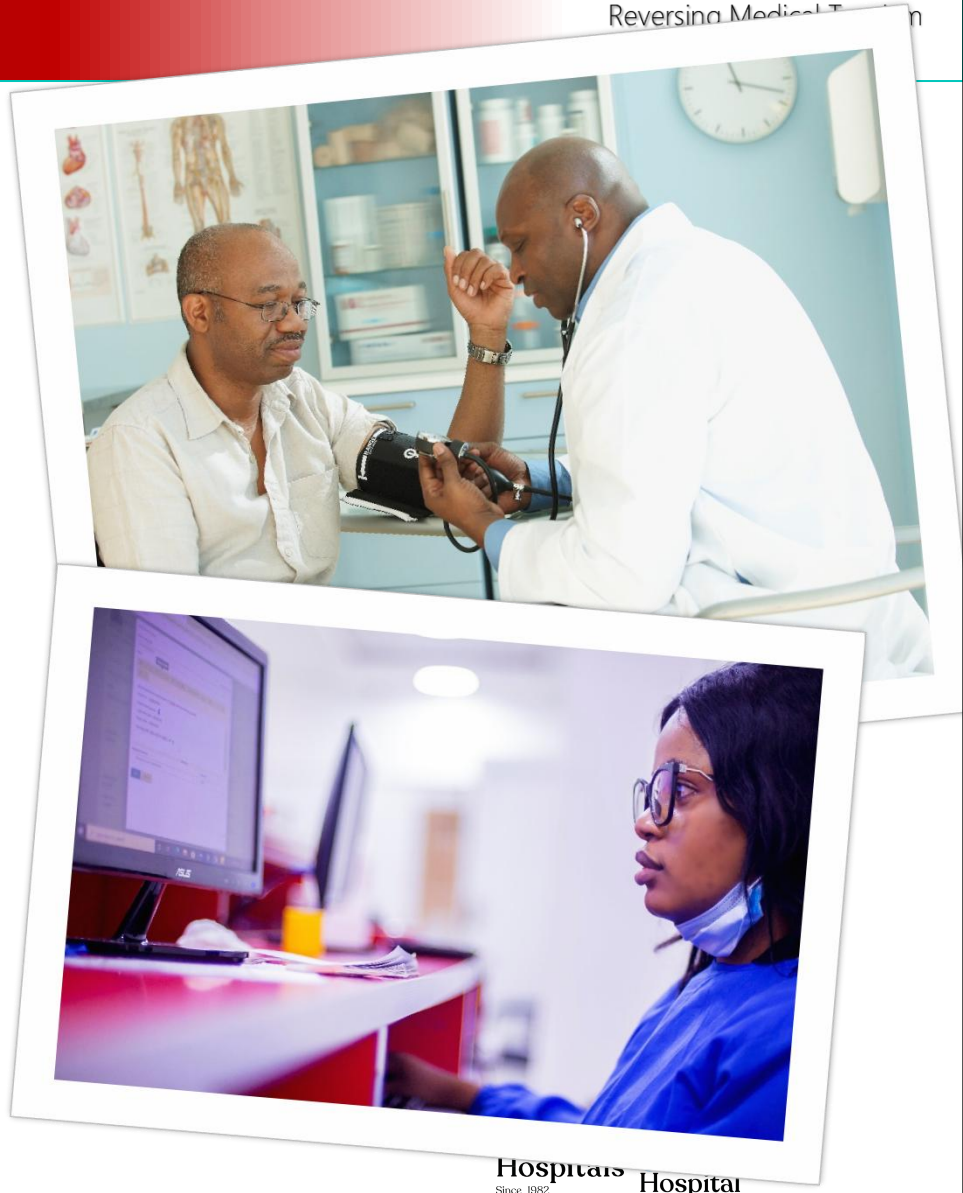
- IV Labetalol
- IV Hydralazine *(may raise intracranial pressure so should be hardly used without specialist input)*
- *Blood pressure drop must be cautious so as not to reduce fetal and placental blood supply*

Management of Severe Hypertension in Pregnancy

- BP requires urgent treatment in a monitored setting when severe (>160/110 mm Hg);
- Acceptable agents for this include oral Nifedipine or intravenous Labetalol (or even Hydralazine).
  - Oral Labetalol may be used if these treatments are unavailable.

How to refer patients to Consider Cardiocare Multispecialty Hospital?

1. Give a standard referral letter & preferably attach any available results
2. **Call:** 0908-331-7777, 0817 444 0888
3. **WhatsApp**: 0908-331-7777
4. **Email**: frontdesk@cardiocare.ng
5. **Visit**: 5, Giza Close Area 11, Garki (off Dunukofia Street-near FCDA) Abuja-FCT.
6. Kindly indicate Doctor's name, & email/phone number especially if you wish to receive a medical report afterwards.



8. Resistant Hypertension

slido

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What is resistant hypertension?

ⓘ Start presenting to display the poll results on this slide.

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- ✓ **Neurology**
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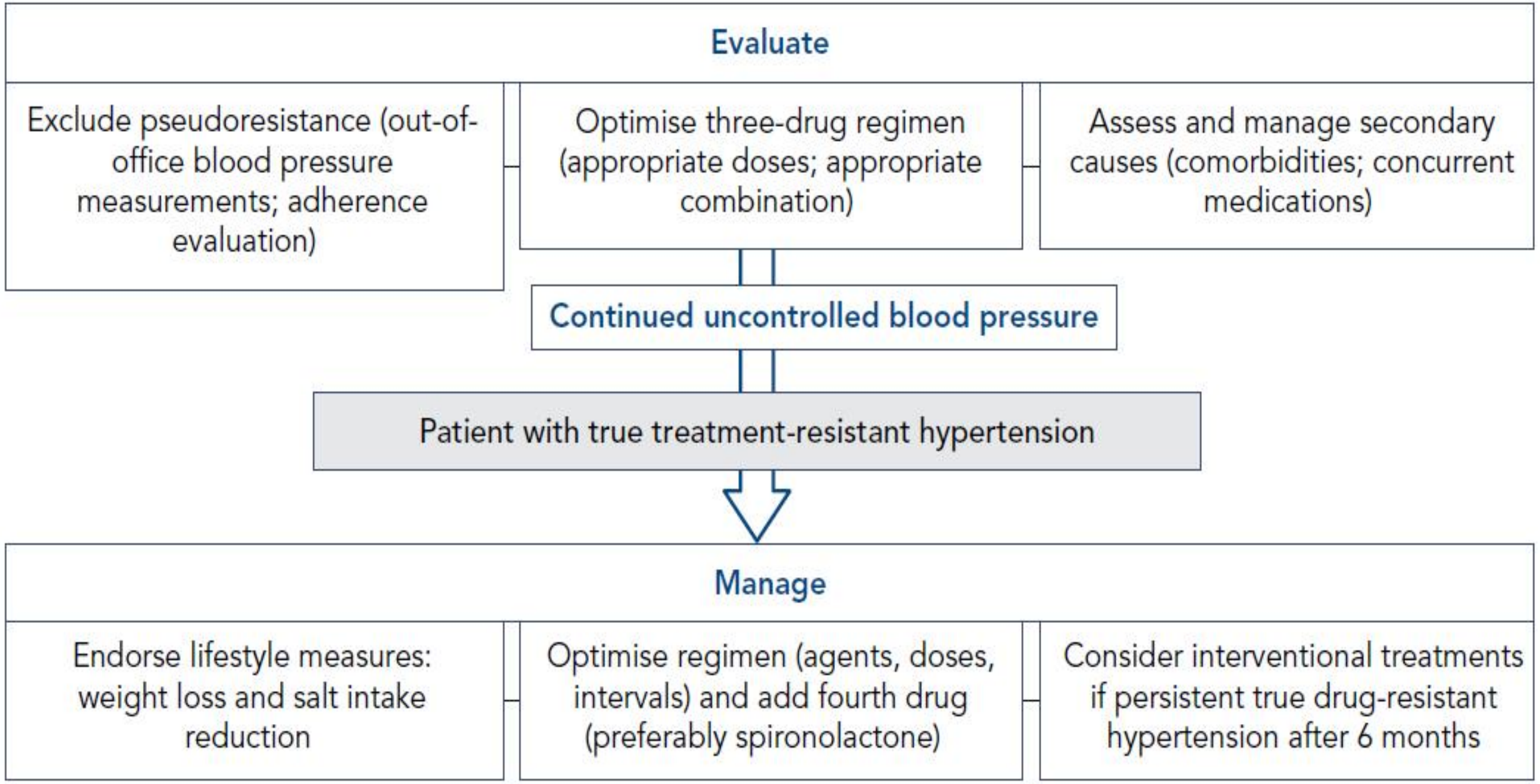
Definition

- ***Resistant hypertension is defined as failure to achieve a blood pressure of 140/90 mm Hg despite the use of a rational triple-drug regimen in optimal doses, including an oral diuretic.***

Resistant hypertension characteristics, secondary causes, and contributing factors

Characteristics of patients with resistant hypertension	Causes of secondary resistant hypertension	Drugs and substances that may cause raised BP
Demographics • Older age (especially > 75 years) • Obesity • More common in black people • Excess dietary sodium intake • High baseline BP and chronicity of uncontrolled hypertension	**More common causes** • Primary hyperaldosteronism • Atherosclerotic renovascular disease • Sleep apnoea • CKD	**Prescribed drugs** • Oral contraceptives • Sympathomimetic agents (e.g. decongestants in proprietary cold remedies) • Non-steroidal anti-inflammatory drugs • Cyclosporin • Erythropoietin • Steroids (e.g. prednisolone, hydrocortisone) • Some cancer therapies
Concomitant disease • HMOD: LVH and/or CKD • Diabetes • Atherosclerotic vascular disease • Aortic stiffening and isolated systolic hypertension	**Uncommon causes** • Phaeochromocytoma • Fibromuscular dysplasia • Aortic coarctation • Cushing's disease • Hyperparathyroidism	**Non-prescription drugs** • Recreational drugs (e.g. cocaine, amphetamines, anabolic steroids) • Excess liquorice ingestion • Herbal remedies (e.g. ephedra, ma huang)



Therapy often requires the use of MRA, centrally acting medicines, direct acting vasodilators and alpha receptor blockers.

9. When to Refer

Suggested indications for specialist referral

- Urgent treatment need: accelerated HTN, severe hypertension, hypertensive emergency, ACS, Stroke etc
- Possible secondary HTN
- Resistant HTN
- Multiple drug intolerance
- Difficult patient
- Unclear Clinical Situation
- Other situations: Unusual BP variability, possible white coat effect, HTN in pregnancy
- End organ damage

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Coronary Angiography

& Percutaneous Coronary Intervention

For Heart Attacks/Myocardial Infarction, Angina, Ischemic Heart Disease/Failure-
Stents, Balloon Angioplasty, & Chronic Total Occlusions (CTO) of Heart Vessels

CONCLUSIONS

- HTN is a preventable major cause of global mortality and morbidity
- The biggest socio-economic impact is on LMICs like Nigeria
- Accurate BP measurement is central to diagnosis and treatment
- Treatment of HTN should be guideline-based and targeted at holistic CV risk reduction
- Adherence has a huge effect on cardiovascular outcomes in HTN

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1. Team of consultants & residents
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3. Opportunity to **discuss & collaborate** with team on referred cases
4. **24/7 emergencies** and **same-day/next-day appointments**
5. Over **400 successful cathlab cases** for:
   - Pacemakers, CRTs, Coronary & Peripheral revascularization with stents, IVC filters, etc. while awake with no scars for vascular interventions.
6. **Ultramodern world-class equipment** & fully computerized systems

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How to refer patients to Consider Cardiocare Multispecialty Hospital?

1. Give a standard referral letter & preferably attach any available results
2. **Call:** 0908-331-7777, 0817 444 0888
3. **WhatsApp**: 0908-331-7777
4. **Email**: frontdesk@cardiocare.ng
5. **Visit**: 5, Giza Close Area 11, Garki (off Dunukofia Street-near FCDA) Abuja-FCT.
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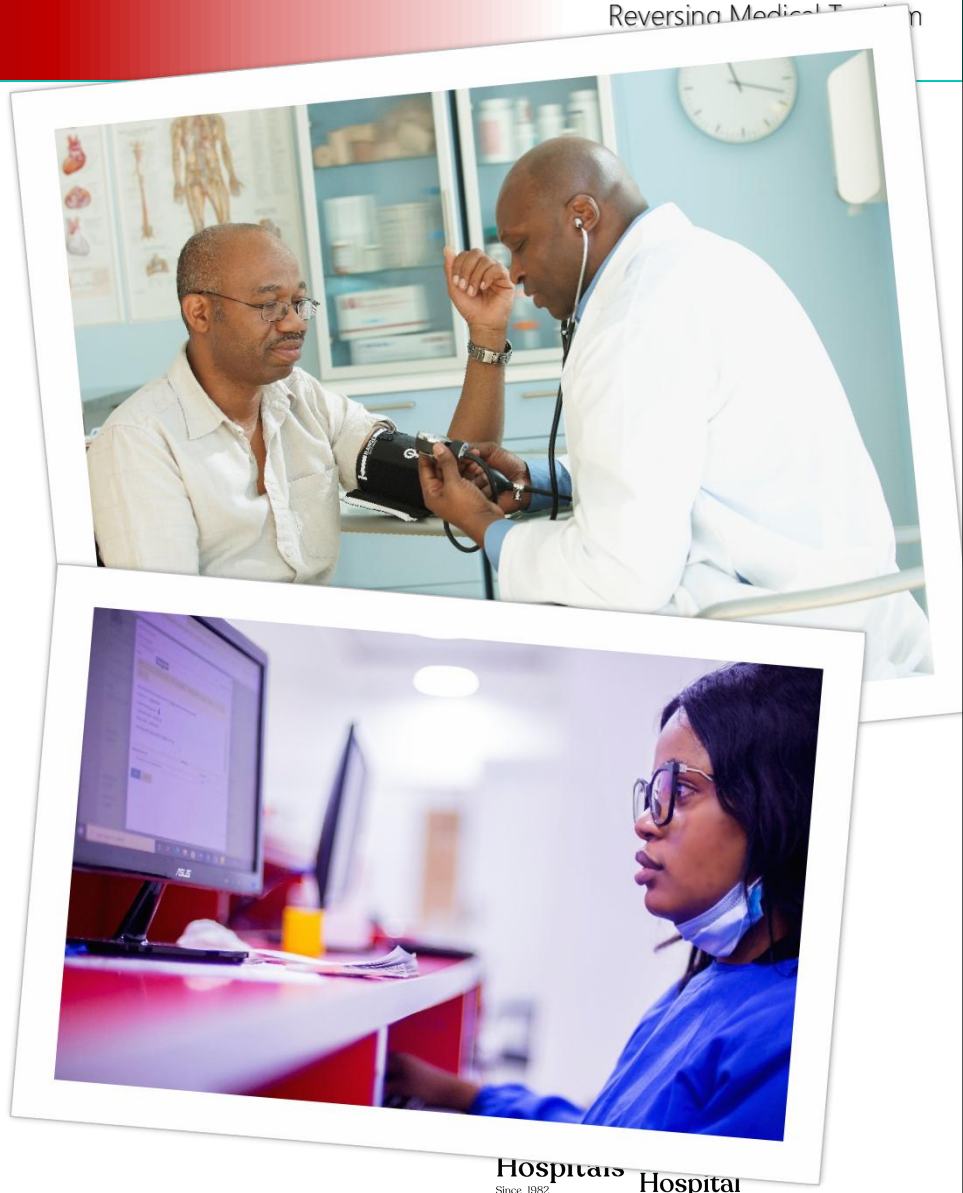

THANK YOU

How can you Partner and Refer?

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Under the auspices/system of the **>40yr old Limi Hospitals** founded in 1982.

Received Multiple **Awards for Excellence in Service.**

We aim to **Transform the practice of Internal Medicine & Related Fields** in Nigeria through a system for **service, training, and research**.

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