

Cardiocare
SPECIALTY HOSPITAL

Pregnancy-related Cardiovascular diseases

8th Annual Cardiovascular Symposium

5th - 6th December 2024

Cardiocare Multispecialty Hospital

Abuja

Dr. Olugbenga Abiodun

Consultant Cardiologist & Head of Internal Medicine

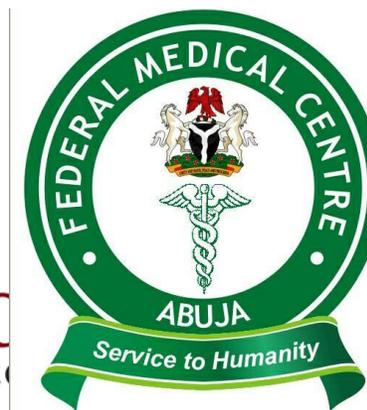
Federal Medical Centre

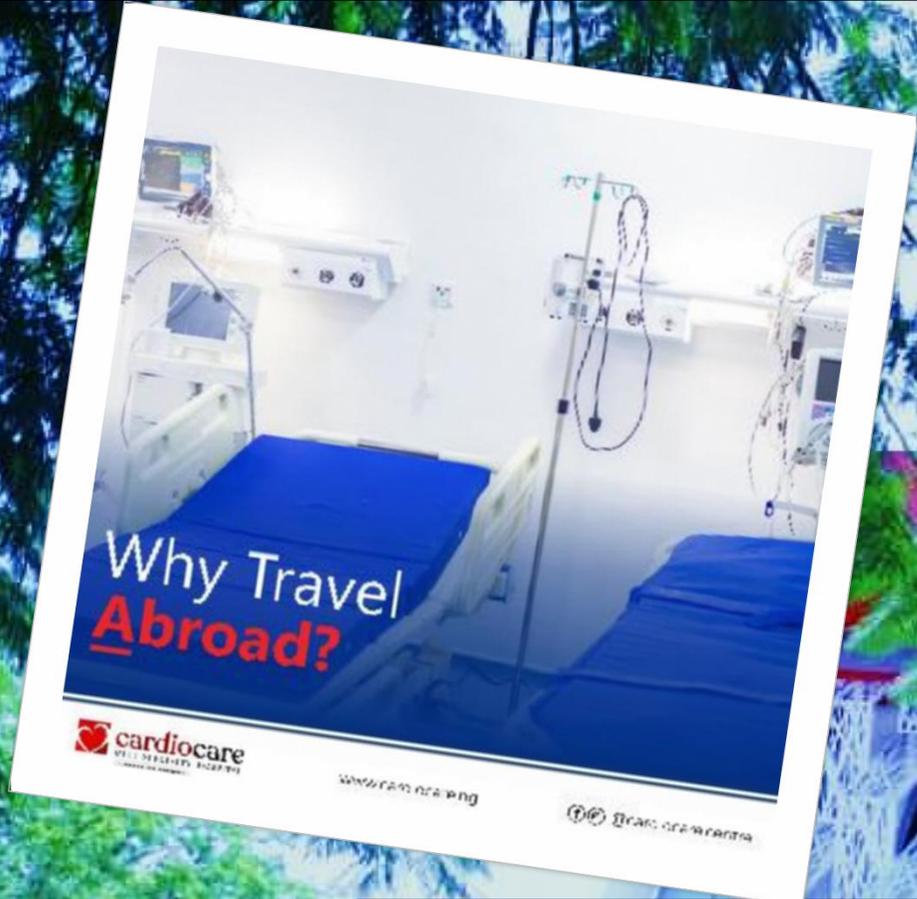
Abuja

8th Abuja Cardiovascular Symposium 2024



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•Clinical & Interventional Cardiology •Endocrinology & Diabetology •Neurology •Nephrology and Dialysis •Hepatology •Critical and Intensive Care •Internal Medicine

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frontdesk@cardiocare.ng

Disclosures

- None for this lecture



 **The Limi Hospital**
Since 1982

 Plot 1487, Off Constitution Avenue, behind ICPC/NDIC, CBD, Abuja.

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 08174440888, 08174445544, 09083317777

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Founded since 1982 to Support and Serve

Outline



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Reversing Medical Tourism

- Introduction
- Epidemiology
- Spectrum of pregnancy-related CVDs
- Risk factors
- Haemodynamic changes in pregnancy
- Clinical presentation
- Spectrum types & management

Introduction



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Reversing Medical Tourism

- *Cardiovascular disease is the leading cause of maternal mortality.*
- *Increased prevalence of cardiovascular disease (CVD) in women of childbearing age.*
- *Up to 4% of pregnancies may have cardiovascular complications despite no known prior disease.*
- **The spectrum of CVD in pregnancy is changing and differs between countries.**



Cardiac Device Implantation, Programming & Replacement

Pacemakers, Implantable Defibrillators, Cardiac Resynchronization
Devices



- Hypertensive disorders are the most frequent CVD during pregnancy, occurring in 6–8% of all pregnancies.
- In the western world, congenital heart disease is the most frequent.
- Rheumatic valvular disease dominates in non-western countries.
- Nigeria has the highest burden of peripartum cardiomyopathy (PPCM) in the world, with an incidence as high as 1:96 deliveries and mortality of 47.4% at 1 year.

Introduction

- 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**.

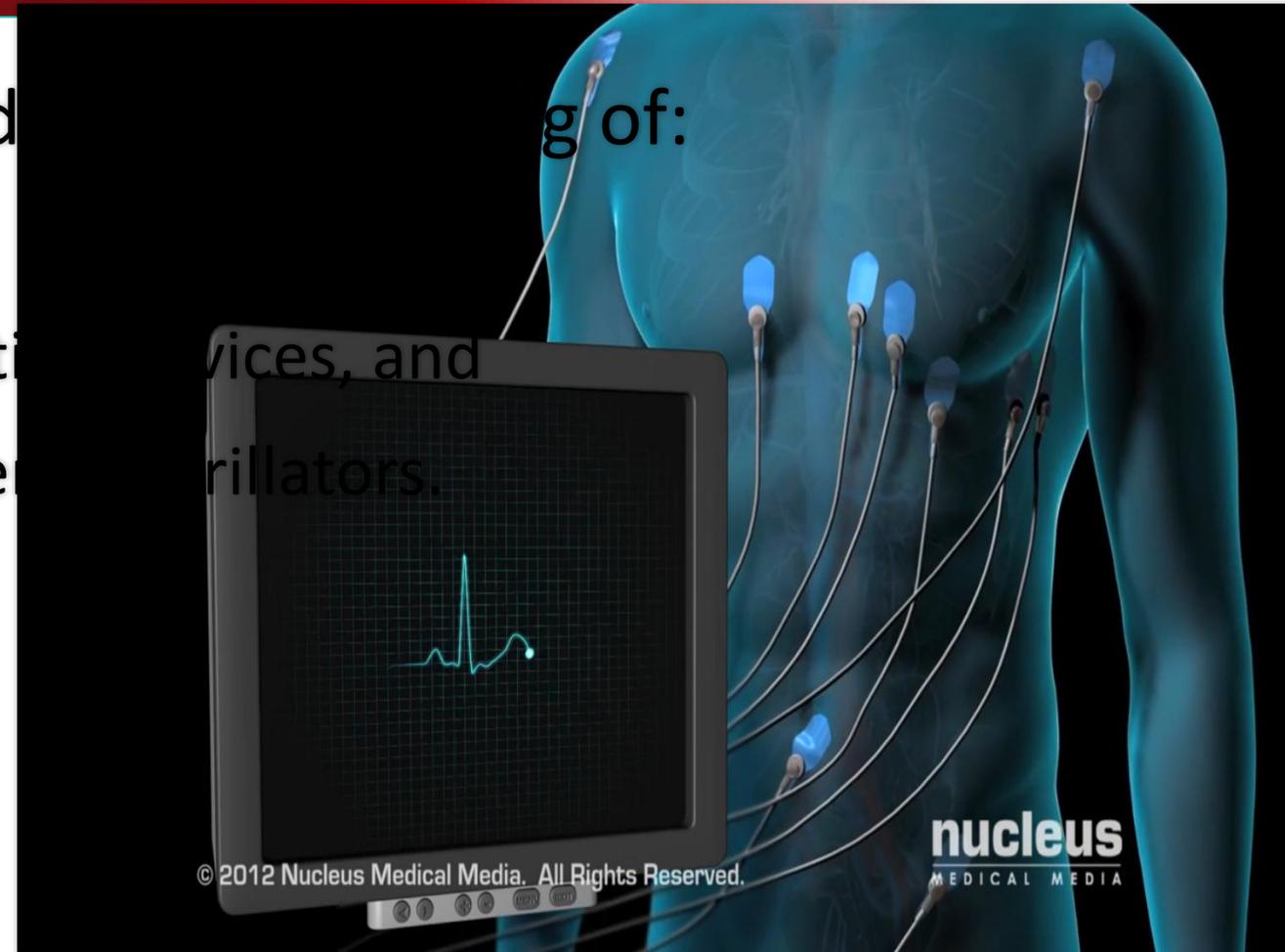
Our Experience- Cardiac Devices



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- 43 (9.5%) permanent cardiac devices
 - 20 (4.4%) Pacemakers,
 - 14 (3.1%) Cardiac resynchronization devices, and
 - 9 (2.0%) implantable cardioverter defibrillators.



Spectrum of CVD in pregnancy



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- Hypertensive disorders
- Peripartum cardiomyopathy
- Congenital heart disease
- Valvular heart disease- rheumatic and non-rheumatic
- Coronary heart disease
- Pulmonary embolism
- Arrhythmias- supraventricular tachycardia, atrial fibrillation
- Stroke

Risk factors

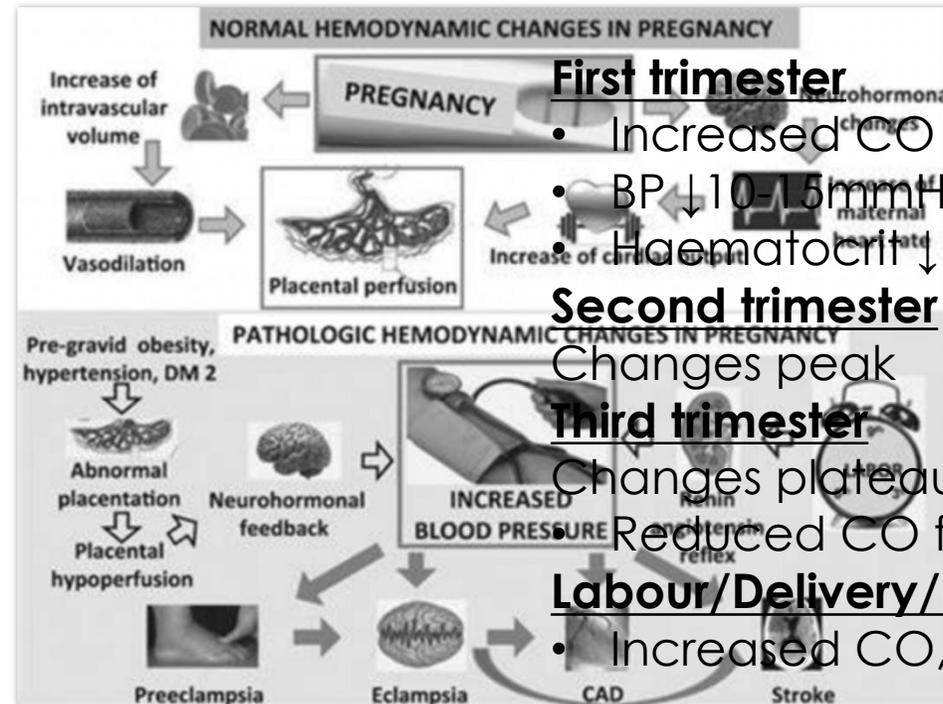


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- Increasing age at first pregnancy
- Cardiovascular risk factors- diabetes, hypertension, and obesity
- Improved treatment of congenital heart disease
- Autoimmune diseases- systemic lupus erythematosus, antiphospholipid syndrome
- Nulliparity/Multiparity/Multifetal pregnancies
- Long inter-pregnancy interval
- Assisted Reproductive Technology

Physiologic & Haemodynamic changes in pregnancy



First trimester

- Increased CO by 30-50% (HR ↑10-15bpm & blood volume ↑)
- BP ↓10-15mmHg (↓SVR from low resistance placental circulation)
- Haematocrit ↓

Second trimester

Changes peak

Third trimester

Changes plateau

• Reduced CO from vena cava compression

Labour/Delivery/Postpartum

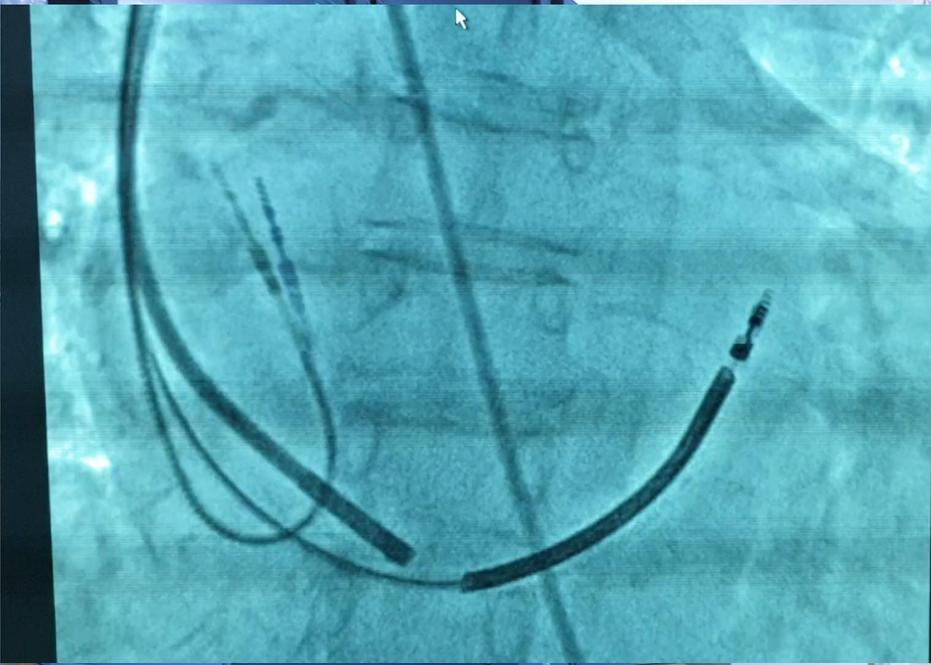
- Increased CO, BP, HR, SVR



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Programming &



Brillators, Cardiac Resynchronization

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Clinical presentation



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- Physiological changes that occur during pregnancy can mimic CVD.
- Careful history and a thorough physical examination is important.
- BP should be measured.
- Listen for pathological murmurs- physiologic murmurs are usually soft, mid-systolic and along the left sternal edge.
- Urinalysis for proteinuria.

- **Pre-pregnancy counselling-** for women with known cardiac or aortic disease who wish to embark on pregnancy.
 - Risk of pregnancy (maternal and fetal risks),
 - Long-term prognosis
 - Fertility and miscarriage rates
 - Risk of recurrence of CHD
 - Plans for pregnancy care and delivery
- **Risk assessment of maternal risk-** with the modified World Health Organization (mWHO), the most accurate risk assessment system.

Specialist evaluation



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- **ECG**- basic screening to identify the need for further study.
- **Echocardiography**- preferred imaging modality in pregnancy.
- **Exercise testing**- a favourable outcome with pregnancy exercise capacity of >80%.
- **Chest radiography/Cardiac CT/Cardiac MRI**
- **Genetic testing and counselling**- heritability of 3-50% in parents with heart disease and 1% risk of inheriting a cardiac defect in those without heart disease.
- **Pre-natal diagnosis**- pre-natal genetic testing, nuchal fold thickness, fetal echocardiography.



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Right Heart (Cardiac) Catheterization and IVC Filters

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Maternal cardiovascular risk assessment



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Table 3 Modified World Health Organization classification of maternal cardiovascular risk

	mWHO I	mWHO II	mWHO II–III	mWHO III	mWHO IV
Diagnosis (if otherwise well and uncomplicated)	Small or mild – pulmonary stenosis – patent ductus arteriosus – mitral valve prolapse Successfully repaired simple lesions (atrial or ventricular septal defect, patent ductus arteriosus, anomalous pulmonary venous drainage) Atrial or ventricular ectopic beats, isolated	Unoperated atrial or ventricular septal defect Repaired tetralogy of Fallot Most arrhythmias (supraventricular arrhythmias) Turner syndrome without aortic dilatation	Mild left ventricular impairment (EF >45%) Hypertrophic cardiomyopathy Native or tissue valve disease not considered WHO I or IV (mild mitral stenosis, moderate aortic stenosis) Marfan or other HTAD syndrome without aortic dilatation Aorta <45 mm in bicuspid aortic valve pathology Repaired coarctation Atrioventricular septal defect	Moderate left ventricular impairment (EF 30–45%) Previous peripartum cardiomyopathy without any residual left ventricular impairment Mechanical valve Systemic right ventricle with good or mildly decreased ventricular function Fontan circulation. If otherwise the patient is well and the cardiac condition uncomplicated Unrepaired cyanotic heart disease Other complex heart disease	Pulmonary arterial hypertension Severe systemic ventricular dysfunction (EF <30% or NYHA class III–IV) Previous peripartum cardiomyopathy with any residual left ventricular impairment Severe mitral stenosis Severe symptomatic aortic stenosis Systemic right ventricle with moderate or severely decreased ventricular function

In women with a moderate or high-risk of complications during pregnancy (mWHO II–III, III, and IV), pre-pregnancy and management during pregnancy and around delivery should be conducted in an expert centre by the p

Maternal cardiovascular risk assessment



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Risk	No detectable increased risk of maternal mortality and no/mild increased risk in morbidity	Small increased risk of maternal mortality or moderate increase in morbidity	Intermediate increased risk of maternal mortality or moderate to severe increase in morbidity	Significantly increased risk of maternal mortality or severe morbidity	Extremely high risk of maternal mortality or severe morbidity
Maternal cardiac event rate	2.5–5%	5.7–10.5%	10–19%	19–27%	40–100%
Counselling	Yes	Yes	Yes	Yes: expert counselling required	Yes: pregnancy contraindicated: if pregnancy occurs, termination should be discussed
Care during pregnancy	Local hospital	Local hospital	Referral hospital	Expert centre for pregnancy and cardiac disease	Expert centre for pregnancy and cardiac disease
Minimal follow-up visits during pregnancy	Once or twice	Once per trimester	Bimonthly	Monthly or bimonthly	Monthly
Location of delivery	Local hospital	Local hospital	Referral hospital	Expert centre for pregnancy and cardiac disease	Expert centre for pregnancy and cardiac disease

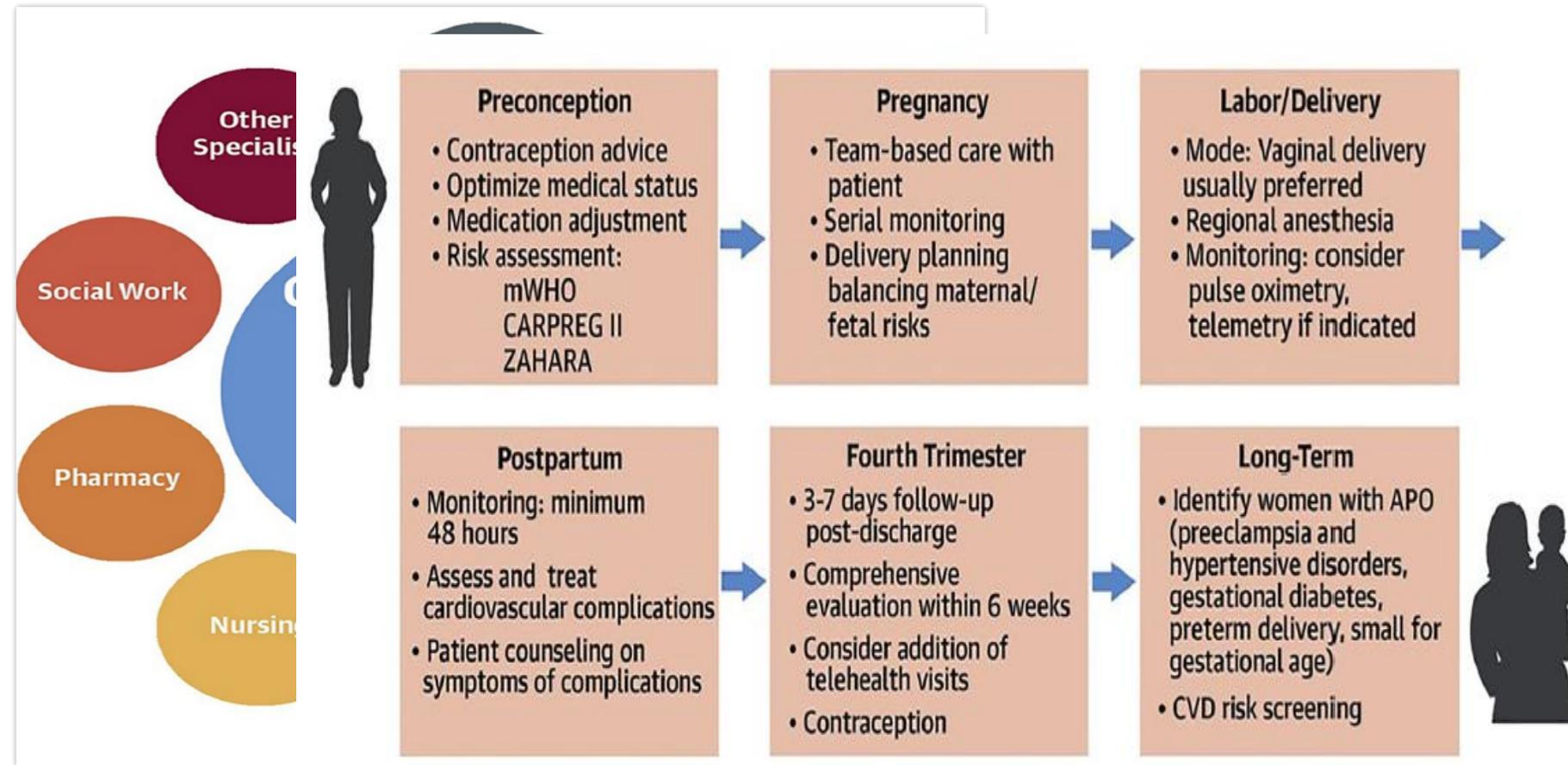
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Cardio-Obstetrics model



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HEART PREGNANCY TEAM





Peripheral Artery and Intervention



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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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WHEN TO REFER- suspicion (unexplained or new CV symptoms and signs) or presence of CV disease

- Heart failure
- Valvular heart disease
- Stroke/TIA
- Aortic disease
- Arrhythmias
- Pulmonary arterial hypertension
- Pericardial disease
- Diabetes mellitus
- Uncontrolled hypertension
- Suspected pulmonary embolism

Hypertensive disorders



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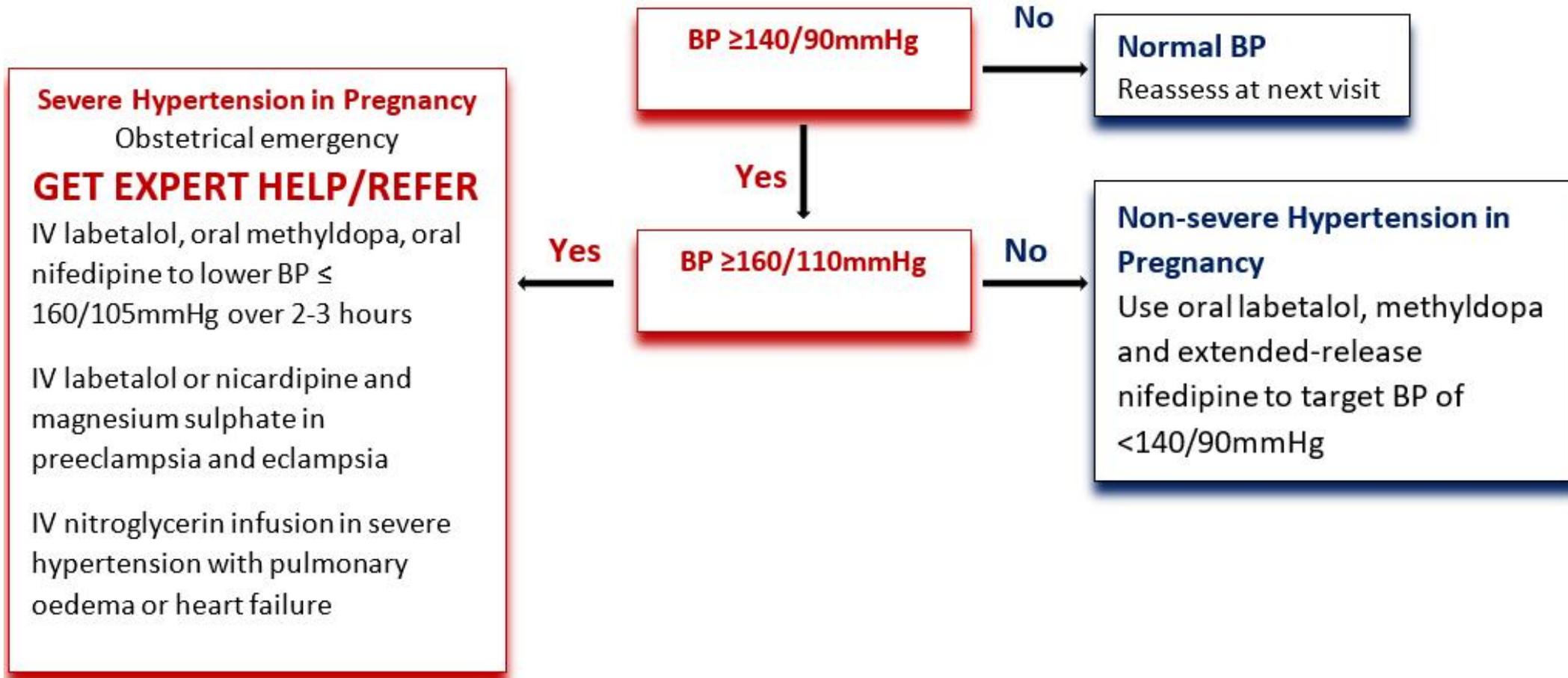
- Hypertension in pregnancy is persistent elevated BP \geq 140/90mmHg.
- Severe hypertension \geq 160/110mmHg
- Hypertensive emergency \geq 170/110mmHg
 - *Chronic hypertension*
 - *Gestational hypertension*
 - *Preeclampsia- proteinuria and maternal organ dysfunction*
 - *Transient hypertension*
 - *Chronic hypertension with superimposed gestational hypertension*

Management of Hypertension in Pregnancy



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Why Consider Cardiocare Multispecialty Hospital?

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



How to refer patients to Consider Cardiocare

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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.



Heart failure- risk factors/causes



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- Hypertension
- Peripartum cardiomyopathy
- Rheumatic valvular heart disease
- Pulmonary hypertension
- Coronary artery disease
- Congenital heart disease
- Pulmonary embolism

Heart failure

- Women with pre-existing HF have a higher risk of pregnancy-related CV complications including HF decompensation.
- Assessment of patients with HF in pre-pregnancy or at presentation with a new pregnancy should include a clinical assessment, ECG echocardiography and maternal and fetal risk assessments.
- Many patients present with HF in the postpartum period

Heart failure

- 32-year-old hypertensive presented to the GP with difficulty with breathing 7/52 following a CS.
- ECHO- showed dilated LV, EF of 45% & grade 3 LVDD.
- NTproBNP- 1400pg/ml
- GP treatment- frusemide 20mg od and spironolactone 25mg od.
- Referred to the Cardiologist 6/12 afterwards and was placed on bisoprolol 2.5mg od, enalapril 10mg od, amlodipine 10mg, spironolactone 25mg od, frusemide 40mg od and to have SGLT2 Inhibitors after completing breastfeeding.
- **NO PREGNANCY** for at least 3 years in the first instance.



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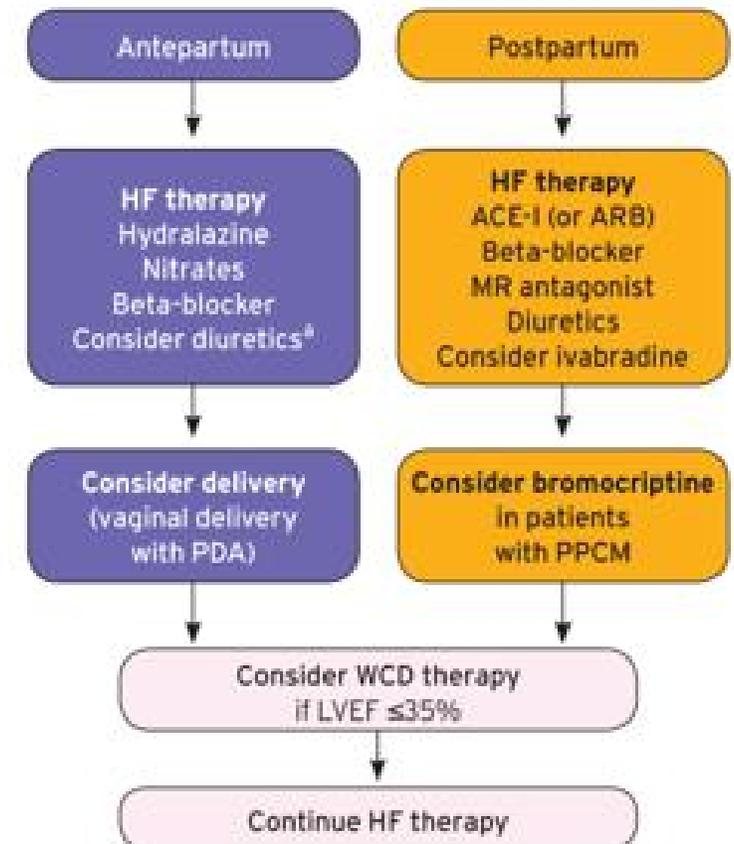
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Coronary Angiography & Percutaneous Coronary Intervention

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

Heart failure

- Refer patients with suspected or established HF whether in the ante-partum or post-partum period to a specialist.



Native valvular disease/Prosthetic valves



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- Manage pregnancy in women with mechanical valves in a centre with a pregnancy heart team.
- Medical therapy is recommended in pregnant women (diuretics/b-blockers)
- Intervention is recommended before pregnancy in patients with severe MS, severe AS with symptoms or EF<50%, severe AR/MR with reduced EF and Marfan with AOD of >45mm.
- A bio-prostheses should be considered in young women contemplating pregnancy.

Stroke- risk factors



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- Dilated Cardiomyopathy- peripartum cardiomyopathy
- Rheumatic valvular heart disease
- Prosthetic valves- suboptimal anticoagulation
- Arrhythmias- Atrial fibrillation
- Sickle cell disease
- Hypertension
- Diabetes mellitus



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Fixing Heart Diseases without Open Surgery while awake.



Stroke

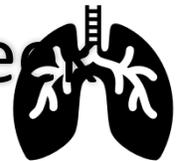
- 33-year-old G4P3 at EGA 5/52
- Had MV replacement in 2015
- Was on warfarin 6mg od, INR of 2.6
- Warfarin replaced with enoxaparin
- Presented 4/52 later with sudden onset weakness of the left side of the body and slurred speech
- Brain CT showed infarct in the internal capsule
- Enoxaparin 40mg bd (Preg. Heart Team)
- Made fully recovery

- The preferred agents for anticoagulation to treat conditions that may lead to stroke or primary prevention of stroke are unfractionated heparin or LMWH.
- Vitamin K antagonists should be avoided in the first trimester and from week 36 onwards.
- Direct oral anticoagulants are not recommended during pregnancy due to safety concerns.

Thromboembolic disease- DVT & PE

- 38-yr-old seizure disorder patient with fracture of the left leg at EGA 16 weeks
- ✓ Declined anticoagulation at the GP
- ✓ Presented to the ER 1/52 later with severe hypoxia

- 41-yr-old physician and asthmatic with IVF multiple gestation with chest tightness of about 1 week
- ✓ Thought it was asthma exacerbation
- ✓ Slumped and died
- ✓ Autopsy confirmed PE



Abuja Cardiovascular Symposia- Five (8) so far.



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- Over 750 participants from over 30 states
- Trained in **PRIMARY CARDIOVASCULAR SKILLS-** mainly
 - ECG interpretation,
 - Basic Management of Diabetes, Hypertension, Acute coronary syndromes, etc
 - Basic Life Support
- **10 CME points & Certificate**



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Arrhythmias- SVT and AFib

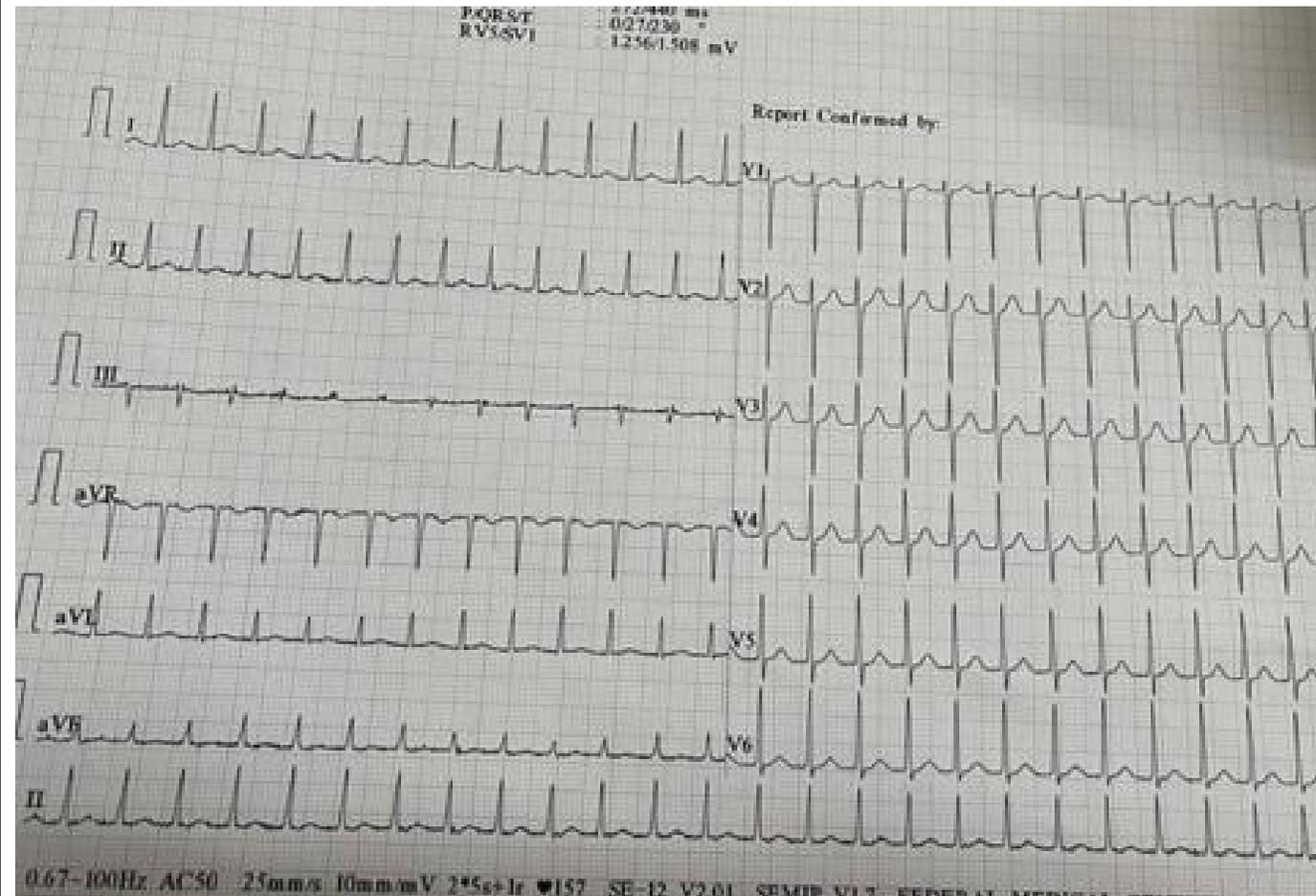


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- Atrial fibrillation and SVTs are one of the most common arrhythmias during pregnancy.
- Rapid atrioventricular conduction of these arrhythmias may have serious haemodynamic consequences for the mother and foetus.
- AF during pregnancy is associated with an increased risk of death.

Arrhythmias- SVT and Afib



Palpitations, chest pain, chest discomfort, dizziness, syncope

Examination and basic investigations-
FBC, TFT, Ca

Abnormal resting ECG

Yes

Supraventricular tachycardia and Atrial fibrillation
GET EXPERT HELP/REFER

Vagal maneuvers for SVT, and if they fail, adenosine recommended for acute SVT

IV beta-1-blockers are first line (metoprolol) followed by digoxin, then verapamil.

DC cardioversion indicated for hemodynamically unstable patients with tachycardia

Unfractionated heparin or LWMH for anticoagulation

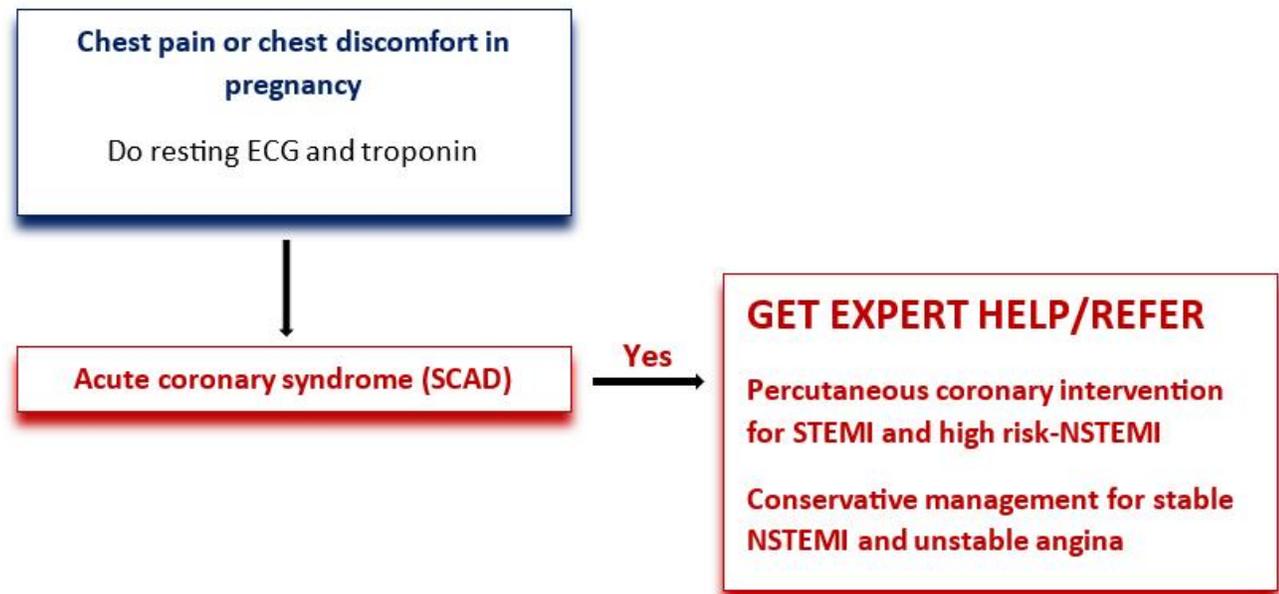
Coronary artery disease/Acute coronary syndrome



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- Will be common as maternal age for pregnancy increases
- Cause different from those of the general population
- Treatment of acute MI similar to that of the general population.



Who is Cardiocare Multispecialty Hospital?



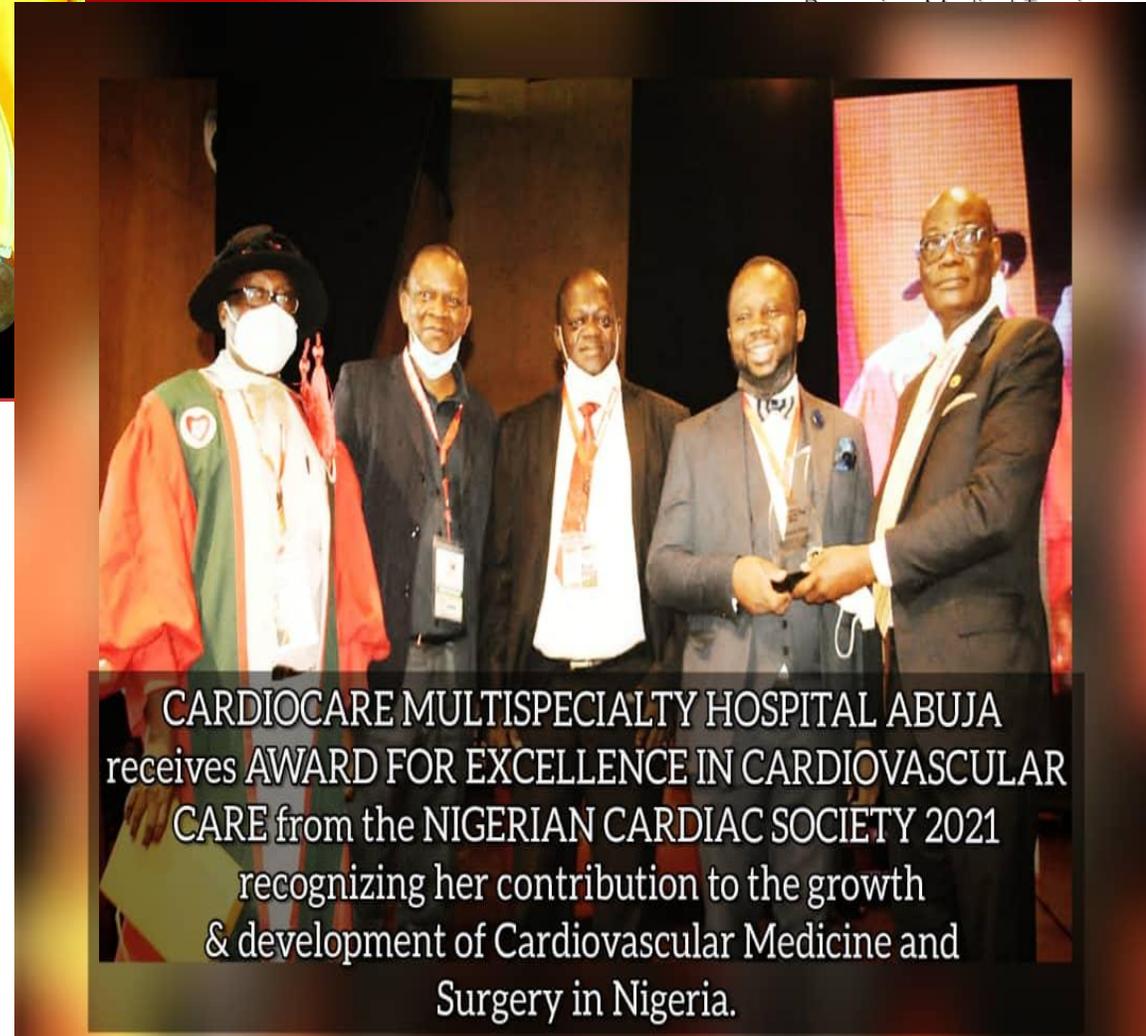
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Pulmonary hypertension and Eisenmenger syndrome



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- PH is an elevation in mean pulmonary arterial pressure (PAP) ≥ 20 mmHg at right heart catheterisation.
- Eisenmenger syndrome- irreversible PH
- Pregnancy should be discouraged in severe PH and should be discussed in pregnant patients.

Recommendations for pregnancy and pulmonary arterial hypertension

Recommendations	Class ^a	Level ^b
Right heart catheterization is recommended to confirm the diagnosis of PAH (group 1). This can be performed during pregnancy but with very strict indications. ¹⁰	I	C
Treatment dose LMWH is recommended in pregnant patients with chronic thromboembolic pulmonary hypertension.	I	C

Labour/Delivery and Breast feeding



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- Vaginal delivery is preferred for most pregnancy-related CVDs with some exceptions
- CS is indicated for obstetric reasons mostly
- Before pharmacological treatment in pregnancy is started, it is recommended to check for clinical safety data.

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Summary

- Pre-pregnancy counselling is recommended for all pregnant women with CVDs.
- Prompt referral of patients with CVDs in pregnancy is essential.
- CVDs in pregnancy should be managed in centres with multispecialty pregnancy heart teams.
- Pregnancy is discouraged in high-risk CVDs.

