MEDICAL DISORDERS IN PREGNANCY

Themba Hospital DipObs Tutorials

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Introduction

- Medical disorders in pregnancy require careful attention to clinical management protocols.
- Women with medical disorders are at higher risk of experiencing mental health difficulties.
- At the same time, women with mental health difficulties have a greater chance of experiencing medical disorders.
- They may face greater challenges in adhering to treatment protocols.
- Thus, for optimal outcomes for mother, fetus and infant, ensure compassionate, respectful care for all women with medical disorders

ANAEMIA

- All pregnant women should have a haemoglobin (Hb) measurement at the first antenatal visit.
- If ≥10g/dL it should be repeated between 28 and 32 weeks and again at 36 weeks.
- Any Hb level of <10 g/dL should be followed up with more frequent Hb measurements after initiating treatment.
- A haemoglobin meter should be used, so that the result is available at

ANAEMIA

Risk Factors

- Poor diet and/or food insecurity related to poverty, Eating disorders - pica
- Parasitic infections such as hookworm and bilharzia,
- Anaemia of chronic disease,
- Short inter-pregnancy interval, Grand-multiparity, Multiple gestations
- History of heavy menses,
- Gastro-intestinal tract disease affecting absorption,
- Malaria

ANAEMIA

PREVENTION

- Give all women with Hb ≥ 10g/dL ferrous sulphate 200 mg oral daily and folic acid 5mg oral daily for the duration of the pregnancy, continue supplementation during lactation.
- Combined iron and folic acid preparations do not usually contain an adequate folic acid dose, so folic acid should be given separately
- Give advice on a balanced diet to prevent nutritional deficiency.

Steps to be taken to improve compliance with and absorption of oral iron tablets:

- Encourage compliance with medication
- Discourage consumption of soil, charcoal, etc.
- Iron supplementation should preferably be taken on an empty stomach

MANAGEMENT OF ANAEMIA

- Look for an underlying cause, and address where possible – iron deficiency is the most common cause
- Take a full history with emphasis on diet, blood loss (menstruation) and obstetric history (number of pregnancies)
- Referral criteria: Refer from a primary health clinic/ community health centre as follows:

Hb <6.0 g/dL	Urgent transfer to hospital the same day.
Hb 6.0-7.9 g/dL	Urgent transfer to a hospital if symptomatic (dizziness, tachycardia, shortness of breath at rest). If not symptomatic, refer to the next high-risk clinic within one week.

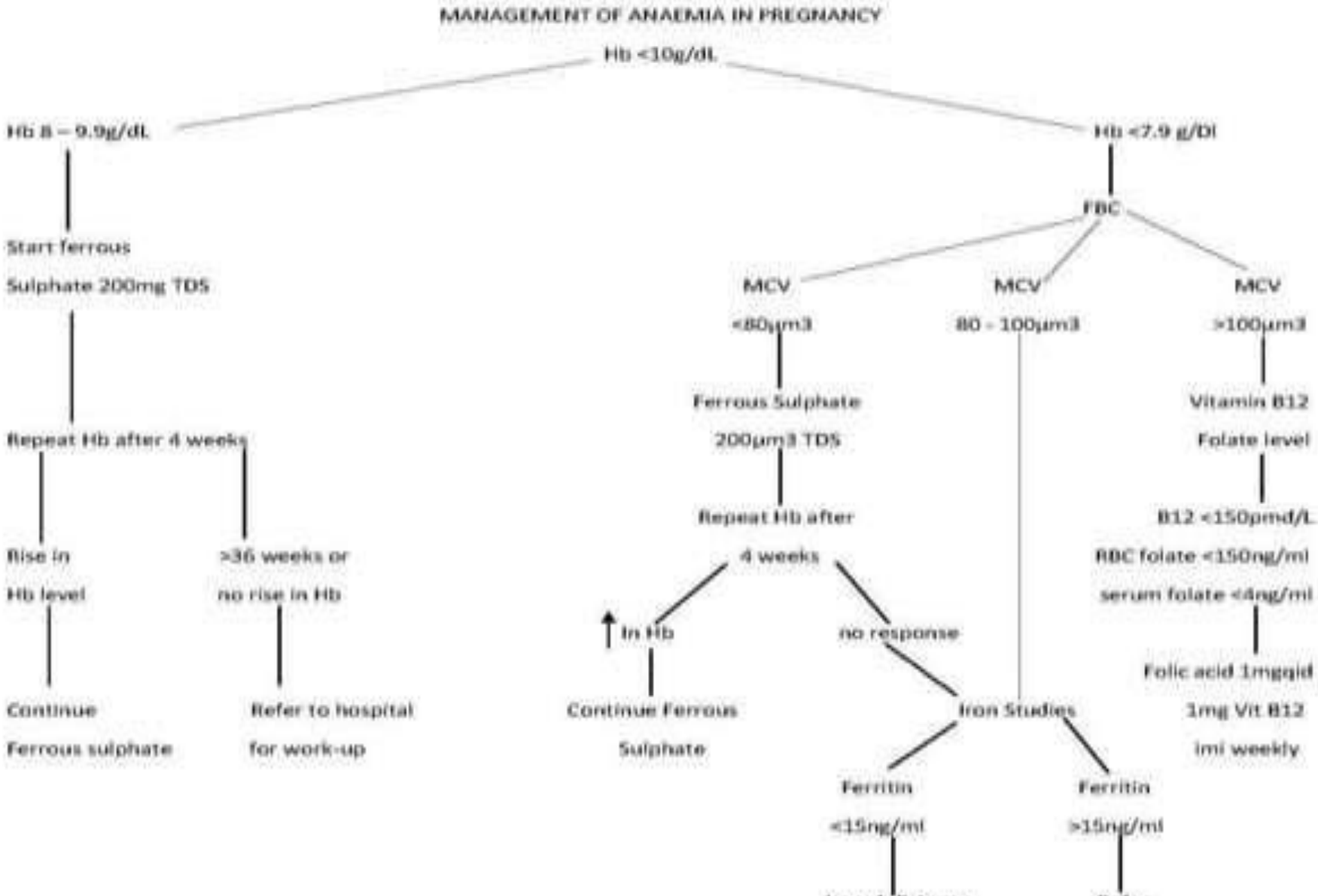
Management of mild anaemia
Hb 8-9.9 g/dL

- Increase ferrous sulphate 200 mg to orally 3 times daily and continue with folic acid 5 mg orally daily.
- Follow up all women < 36 weeks pregnant with mild anaemia with a repeat Hb after four weeks.
- If there is no response to oral iron/folate treatment or if ≥ 36 weeks, refer to the district hospital for further investigation.
- If no response to oral iron treatment or if ≥ 36 weeks, and if iron deficiency confirmed (minimum investigation: full blood count and smear), consider intravenous iron therapy (in hospitals only).
- Intravenous iron will raise the Hb faster than oral iron.

Management of moderate to severe anaemia (Hb ≤7.9 g/dL)

Investigate the anaemia at the hospital/high risk clinic and look for underlying causes:

- Take blood for a full blood count (FBC): the mean cell volume (MCV) indicates the probable cause of anaemia:
- MCV < 80um3 suggests iron deficiency anaemia (microcytic)
- MCV (80-100um3) suggests anaemia of chronic disease (normocytic)
- MCV (>100um3) suggests folate or vitamin B12 deficiency anaemia (macrocytic)
- If the FBC shows a microcytic picture, it is reasonable to initially treat as iron-deficiency anaemia
- if the FBC shows a normocytic or macrocytic picture, do further tests: iron studies, red cell folate and vitamin B12 levels to identify the cause
- Send urine away for microscopy and culture, and a stool sample for occult blood and parasites.
- Do a malaria smear, where relevant
- Start treatment for anaemia with ferrous sulphate 200 mg oral 3 times daily, and continue with folic acid 5mg orally daily
- If the Hb is <6.0 g/dL or if the patient is symptomatic (dizziness, tachycardia, shortness of breath at


MANAGEMENT OF ANAEMIA IN PREGNANCY
Hb <10g/dL
Hb 8 – 9.9g/dL
Hb <7.9 g/Dl
Start ferrous
Sulphate 200mg TDS
FBC
MCV
<80µm3
MCV
80 - 100µm3
MCV
>100µm3
Ferrous Sulphate
200µm3 TDS
Vitamin B12
Folate level
Repeat Hb after 4 weeks
Repeat Hb after
4 weeks
B12 <150pmd/L
RBC folate <150ng/ml
serum folate <4ng/ml
Rise in
Hb level
>36 weeks or
no rise in Hb
In Hb
no response
Folic acid 1mgqid
1mg Vit B12
imi weekly
Continue
Ferrous sulphate
Refer to hospital
for work-up
Continue Ferrous
Sulphate
Iron Studies
Ferritin
<15ng/ml
Ferritin
>15ng/ml

ANAEMIA

- If there is a failure to respond to oral iron therapy, compliance with the supplements should be considered and the results of iron studies, red cell folate and vitamin B12 levels should be checked and treated accordingly.
- If there is no response to oral iron treatment or if ≥36 weeks, and if iron deficiency confirmed, consider administering parenteral iron therapy (in hospitals only).
- Women on oral iron therapy should continue treatment for a further 3 months after normalisation of haemoglobin levels so that iron stores are replenished.

BLOOD TRANSFUSION FOR ANAEMIA

As a guideline, an anaemic patient should be transfused at least one unit of packed red cells if:

- Hb <8.0 g/dL and the woman is going for an emergency caesarean delivery
- Hb <6.0 g/dL and the woman is in labour (vaginal delivery anticipated)
- Patients booked for elective caesarean section should have their anaemia corrected, preferably by means other than transfusion, before

DIABETES MELLITUS

PREGESTATIONAL DIABETES MELLITUS

- This is diabetes that has been present before the current pregnancy.
- These women require tight control of their blood glucose levels and should book for antenatal care as soon as pregnancy is confirmed.
- Ideally, women known to have diabetes should plan their pregnancy, and attend a specialist clinic to optimise control of their diabetes (HbA1c <6.7%), before they get pregnant.
- Diabetic women who get pregnant should be referred to a specialist health facility/clinic.
- Follow-up care may be continued at a district hospital, in accordance with instructions from the specialist clinic.
- Stop sulphonyl ureas, statins and ACE-inhibitors.
- Metformin is safe in pregnancy and should not be stopped. {If a woman presents before 16 weeks gestation start on Aspirin 75mg nocte orally}.
- Ideally, all pregnant women with pre-gestational diabetes should be referred for a first and

DIAGNOSIS OF OVERT DIABETES MELLITUS IN PREGNANCY

If a pregnant woman meets any of the criteria for overt diabetes mellitus, she can be diagnosed as an overt diabetic:

- Random glucose ≥11.1mmol/l
- Fasting glucose ≥7mmol/l
- HbA1c >6.5%
- She does not require an OGTT.
- 2-hour glucose on 75g-2h-OGTT ≥11.1mmol/l

GESTATIONAL DIABETES MELLITUS

- This is diabetes that develops during pregnancy or is diagnosed for the first time during the current pregnancy and resolves within 6-weeks post-partum.

Screening and diagnosis

- All pregnant women with risk factors for diabetes in pregnancy should be screened at the first antenatal visit and again at 24 – 28 weeks if the initial screen was negative.
- All women with no risk factors should be screened for gestational diabetes at 24 – 28 weeks gestation

Risk factors for gestational diabetes

Underlying patient factors	Patient from an ethnic group with high prevalence of diabetes (e.g. Indian)
	Obesity (patient BMI ≥35)
	Age ≥40 years
Previous history	Previous history of gestational diabetes (diabetes in a previous pregnancy)
	First degree relative with diabetes
	Previous unexplained intrauterine fetal death
	Previous baby with congenital abnormalities
	Previous macrosomic baby (birth weight ≥4 kg)
Current pregnancy	Polyhydramnios
	Fetus large for gestational age
	Glycosuria (glucose 1+ or more on urine dipstick)

GESTATIONAL DIABETES MELLITUS

Screening method

- There is a lack of consensus regarding the best screening method for gestational diabetes.
- Different screening methods may be used depending on the preference at the local specialist referral centre.
- Laboratory glucose measurements are the gold standard for the diagnosis of gestational diabetes.
- Point-of-care glucometer tests can be used.

Example of a diagnostic test

- The patient must be fasting (drink only water from 22:00 the night before).
- Testing should be performed first thing in the morning.
- Take a fasting glucose test, and then give oral glucose 75 g dissolved in 250-300 mL water and take blood for glucose level one hour and two hours after giving glucose.
- Either the NICE or WHO 2015 diagnostic criteria should be used.
- NICE criteria "A fasting blood glucose level of ≥5.6mmol/l or a two hour value of ≥7.8 mmol/L indicates diabetes and the woman should be managed as a gestational diabetic."

MANAGEMENT OF DIABETES MELLITUS

Initial management

,Advise the woman to start with lifestyle modifications (stop smoking, stop alcohol, moderate exercise), dietary advice immediately and refer to a dietician

- Call the woman back to the high-risk clinic two weeks later; advise her to come "fasted" in the morning, carrying her breakfast with her.
- Check fasting blood glucose level (glucometer) on arrival and then two hours after breakfast (post-prandial).
- If fasting blood sugar <5.3 mmol/L, post-prandial <7 mmol/L, it is appropriate to continue with dietary management.
- Recheck fasting and post-prandial blood glucose every two weeks.

Management of Infant of Diabetic Mother (IDM) Before delivery:

- Anticipate need for resuscitation based on expected birthweight, gestational age, known anomalies, labour complications and mode of delivery.
- After delivery: Rapid assessment and resuscitation as needed.
- Examination to identify congenital anomalies.
- Feed within 30 minutes, feeds 2-3 hourly.
- Monitor blood glucose: 30 minutes after 1st feed, and 2-3 hourly pre-feed thereafter; may stop monitoring once three consecutive normal blood glucose readings pre-feed, baby is feeding well and asymptomatic.
- Maintain blood glucose ≥ 2.6 mmol/ℓ.

Signs of Hypoglycaemia:

- Irritability
- Jitteriness
- Exaggerated Moro reflex
- High pitched cry, seizures
- Lethargy
- Hypotonia
- Hypothermia
- Apnoeas
- Cyanosis
- Poor feeding
- *Babies may be asymptomatic

CARDIAC DISEASE

- Women with heart disease should ideally have a planned pregnancy managed by a multi-disciplinary team consisting of a maternal-foetal specialist, a cardiologist, a paediatrician and an anaesthetist.
- Pre-pregnancy counselling allows the patient to make an informed decision prior to embarking on a pregnancy.
- At the first antenatal visit, all women should be asked about a history of heart disease (including heart operations and attendance at cardiac clinics), and about current symptoms of heart disease.
- Clinical examination of the cardiovascular system should include auscultation of the heart.
- As a minimum the blood pressure must be checked and the pulse rate checked separately (manually).

CARDIAC DISEASE

The following are symptoms and signs suggestive of cardiac disease in pregnancy:

- Shortness of breath at rest or with mild exercise
- Shortness of breath when lying flat
- Haemoptysis
- Palpitations
- Chest pain
- Tachycardia at rest (≥100/min) or irregular heart rate
- Loud heart murmurs

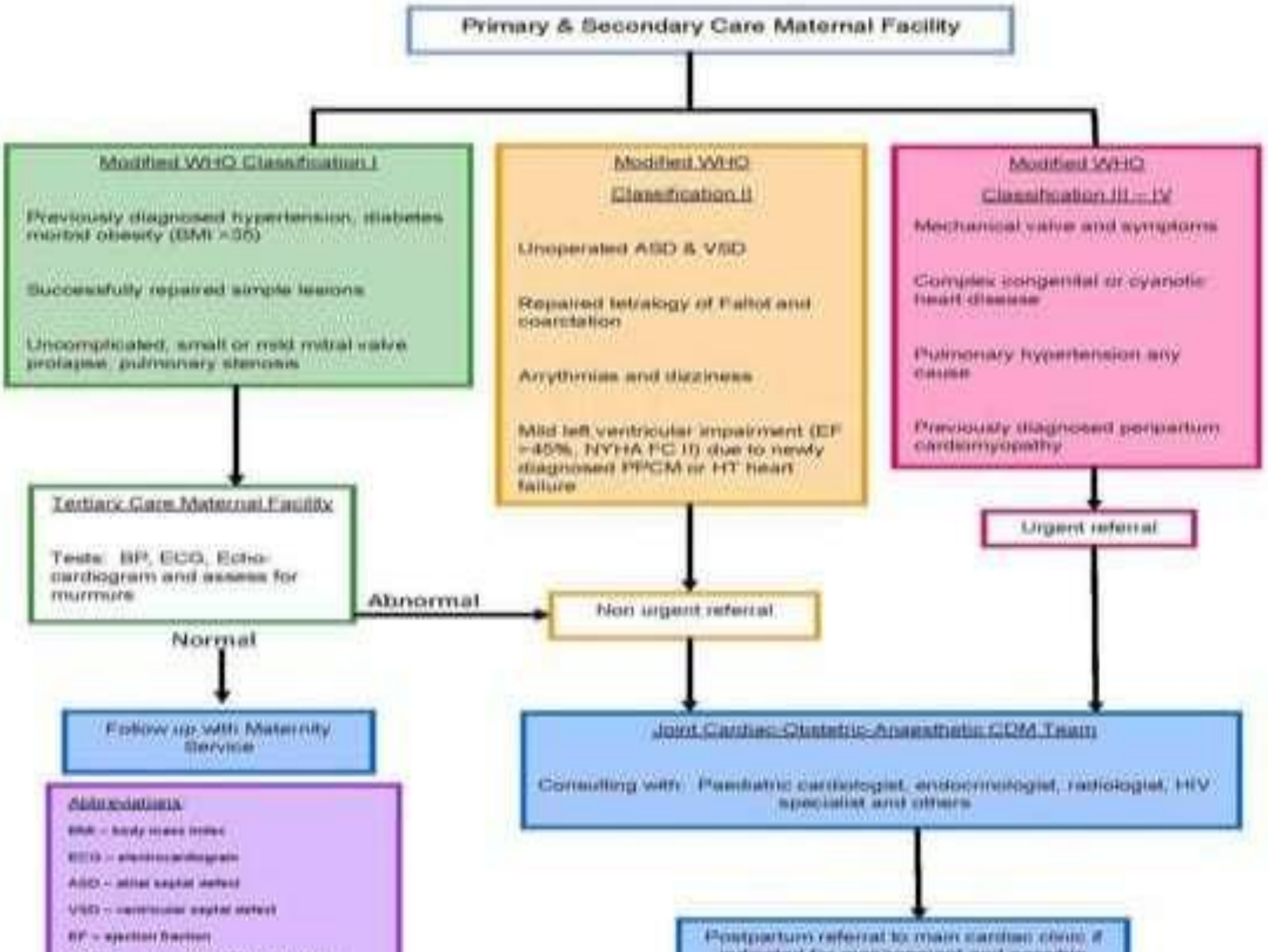
New York Heart classification (NYHA) for heart failure

Class 1	No limitation of physical activity. Ordinary physical activities does not cause undue fatigue, palpitations, shortness of breath, chest pain
Class 2	Ordinary physical activities does cause undue fatigue, palpitations, shortness of breath, chest pain
Class 3	Less than ordinary physical activities does cause undue fatigue, palpitations, shortness of breath, chest pain
Class 4	Symptoms at rest. Fatigue, palpitations, shortness of breath, chest pain occurs at rest

CARDIAC DISEASE

Referral of women with suspected or confirmed cardiac disease in pregnancy

- Women with suspected cardiac disease and who are in a stable condition should be referred to tertiary centre, within one week.
- Women presenting with difficulty in breathing, systolic blood pressure <100mmHg, heart rate > 120 bpm or appearing cyanotic need to be referred to a tertiary centre by ambulance within 24 hours.
- Women with NYHA class 2-4 need to be referred to tertiary centre by ambulance within 24 hours.
- In women with known cardiac disease in pregnancy, the following referral algorithm should be used to guide for referral to higher levels of care.


Primary & Secondary Care Maternal Facility
Modified WHO Classification I
Previously diagnosed hypertension, diabetes morbid obesity (BMI >35)
Successfully repaired simple lesions
Uncomplicated, small or mild mitral valve prolapse, pulmonary stenosis
Modified WHO Classification II
Unoperated ASD & VSD
Repaired tetralogy of Fallot and coarctation
Arrythmias and dizziness
Mild left ventricular impairment (EF >45%, NYHA FC II) due to newly diagnosed PPCM or HT heart failure
Modified WHO Classification III – IV
Mechanical valve and symptoms
Complex congenital or cyanotic heart disease
Pulmonary hypertension any cause
Previously diagnosed peripartum cardiomyopathy
Tertiary Care Maternal Facility
Tests: BP, ECG, Echo-cardiogram and assess for murmurs
Abnormal
Normal
Non urgent referral
Urgent referral
Follow up with Maternity Service
Joint Cardiac-Obstetric-Anaesthetic CDM Team
Consulting with: Paediatric cardiologist, endocrinologist, radiologist, HIV specialist and others
Abbreviations
BMI – body mass index
ECG – electrocardiogram
ASD – atrial septal defect
VSD – ventricular septal defect
EF – ejection fraction

MANAGEMENT DURING LABOUR

- Cardiac patients should deliver in a specialist health facility and can be referred there if in early labour.
- However, there may be occasions when a cardiac patient presents in advanced labour to the MOU/CHC or the district hospital and may deliver there before transfer can be arranged.

The following recommendations must be followed in such circumstances:

First stage of labour

- Her upper body raised to 45 degrees.
- Secure intravenous access (for drug administration), but avoid giving large amounts of intravenous fluids (use a 200 ml fluid bag and run slowly if at all). Oral fluids should be available to the patient whenever thirsty.
- Give adequate analgesia - Pethidine 100 mg IM with Promethazine 25 mg IM and/or nitrous oxide 50 per cent and oxygen 50 per cent (Entonox)
- Give Ampicillin 1 g IV six hourly and Gentamicin 240 mg IV as a single dose; or Vancomycin 1 g IV as a single dose (for women allergic to penicillin).
- Monitor intravascular fluids, pulse, respiratory rates and regular auscultation of maternal lung bases is required during labour.

Second and third stage of labour

- Spontaneous delivery is usually preferable to Caesarean delivery, unless there are obstetric reasons for surgery.
- Avoid the lithotomy position: the mother must remain upright or semi-upright when delivering, with her legs supported by two assistants below the level of her chest.
- Once the foetal head has engaged and the mother is bearing down, perform instrumental delivery unless delivery is rapid and easy.
- Local anaesthetics for episiotomy should not contain adrenaline. Episiotomy should not be done routinely.

MANAGEMENT DURING LABOUR

Fourth stage and puerperium

- The first 24 hours post-delivery is the most common time for the cardiac patient to decompensate and go into pulmonary oedema.
- Try to avoid intravenous fluids. If an oxytocin infusion is required to control or prevent PPH, it should be given in concentrated form (20 units in 200 mL, at 20 mL/hour).
- Observations in a high-care setting are required for at least 24 hours post-delivery.
- Thus, even after an uneventful delivery, transfer to a specialist hospital is recommended for observations and specialist assessment, and to arrange follow-up for the cardiac problem.
- Screen newborn for congenital heart disease in mothers with congenital heart disease.
- Offer contraceptive advice , Oestrogen containing oral contraceptives should be avoided
- Progesterone containing agents are safe and effective
- Tubal ligation, Vasectomy

MANAGEMENT OF PULMONARY OEDEMA

- Have a high index of suspicion
- Nurse the mother with her upper body raised to 45 degrees, Give oxygen by facemask.

ASTHMA

REFERRAL

- Pregnant women with an acute asthmatic attack must be referred as an emergency from a clinic / CHC to the district hospital.
- Women with a history of asthma (no current attack) should be referred to the next high-risk antenatal clinic.
- Women with recurrent severe attacks should be referred to a centre with specialist physicians/ pulmonologists.
- The aim of treatment is to achieve freedom from symptoms such that lifestyle is not affected.
- Management of asthma in pregnancy does not differ from that in non-pregnant women.
- Beta-2 stimulants (e.g. salbutamol), inhaled and systemic steroids, aminophylline and ipratroprium bromide are all safe in pregnancy.
- Manage labour and delivery according to normal obstetric principles.
- Women who are on chronic oral steroid treatment should receive hydrocortisone 100 mg IV six hourly during labour or at the time of caesarean section.

THROMBOEMBOLISM (VTE)

- Pregnancy is a hypercoagulable state
- Prevention of VTE in pregnancy
- Women are at increased risk of thromboembolism in pregnancy and in the puerperium.

Thromboprophylaxis may be required throughout pregnancy and the puerperium for the highest risk patients, including those with:

- A previous personal history of VTE
- Strong family history of VTE
- Patients with prolonged immobility (e.g. due to AIDS or paraplegia)
- Medical co-morbidities such as SLE, cancer, nephrotic syndrome
- Any surgical procedure in pregnancy
- Anti-phospholipid syndrome / recurrent miscarriage
- Dehydration / hyperemesis (transient risk factor)
- These patients should be discussed and managed in conjunction with a specialist

THROMBOEMBOLISM (VTE)

Diagnosis and initial management of VTE in pregnancy and post-partum

- Symptoms and signs of deep vein thrombosis
- Acute unilateral diffuse leg swelling (significant preponderance to L-sided DVT)
- Pain
- Redness
- Warm lower limb
- The diagnosis is confirmed using compression duplex ultrasound

Pulmonary embolus

- A high index of suspicion is needed. The clinical indications for imaging evaluation of suspected pulmonary embolus in pregnancy includes shortness of breath, pleuritic chest pain, hypoxemia, tachycardia and to a lesser extent tachpnoea, hemoptysis, syncope, cough, unexplained hypotension and chest pain

Diagnosis

- Arterial blood gas may re veal hypoxemia and hypocapnia
- Lung scan

MANAGEMENT OF VTE IN PREGNANCY

- If there is a strong suspicion of DVT or pulmonary embolus start treatment with low molecular weight heparin. e.g. enoxaparin 1mg/kg sub-cutaneous twice a day.

- Alternatively, use intravenous unfractionated heparin - initial bolus of 80units/kg, followed by a continuous infusion of 18 units/kg/hour.

- Arrange transfer to a specialist centre to confirm diagnosis.
- Warfarin therapy is only recommended in the post-partum period

SHORTNESS OF BREATH IN PREGNANCY

- Shortness of breath is common among healthy women with normal pregnancies and is considered a normal physiologic response to pregnancy.
- However, shortness of breath may also be the result of underlying heart or lung pathology.
- Women presenting with difficulty in breathing, systolic blood pressure of <100mmHg, heart rate >120 beats per minute or appearing cyanotic need to be transferred with an ambulance to a tertiary centre within 24 hours.
- Patients presenting with signs of fluid overload (pulmonary or pedal oedema or a raised JVP) should receive a bolus of lasix 40mg IVI and oxygen per face-mask prior to transfer.

Any red flags?

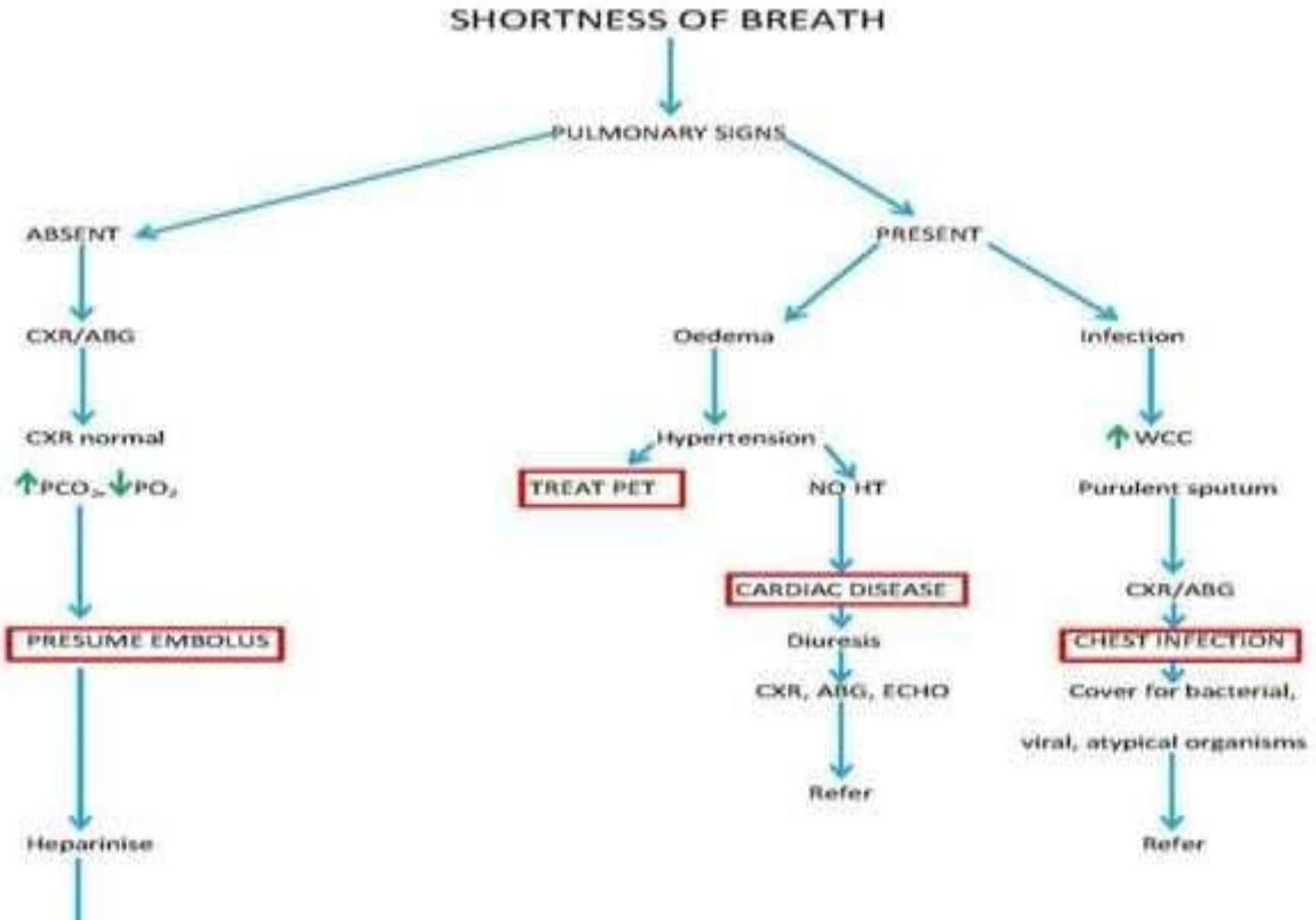
- Sat O2<95%
- HR>120bm
- RR>24bm
- Altered mental status
- Stridor

SHORTNESS OF BREATH IN PREGNANCY

- Clinicians should have a low threshold for investigating pregnant or recently delivered (up to 6 months postpartum) women, especially those with cardiovascular risk factors (hypertension, diabetes), suspected rheumatic heart disease or with symptoms such as shortness of breath or chest pain.

Appropriate investigations include:

- Blood tests: FBC, UKE, LFT, CRP, clotting profile, arterial blood gas
- Remember to exclude COVID-19 (COVID-19 swab)
- ECG, chest x-ray, echocardiogram and CT pulmonary angiography if indicated


SHORTNESS OF BREATH
PULMONARY SIGNS
ABSENT
PRESENT
CXR/ABG
Oedema
Infection
CXR normal
Hypertension
↑WCC
↑PCO2 ↓PO2
TREAT PET
NO HT
Purulent sputum
CARDIAC DISEASE
CXR/ABG
PRESUME EMBOLUS
Diuresis
CHEST INFECTION
CXR, ABG, ECHO
Cover for bacterial,
viral, atypical organisms
Refer
Heparinise
Refer

EPILEPSY

- Ideally, women with epilepsy should plan their pregnancy, and attend a specialist clinic to optimise the control of their disease and review the anti-epileptic drug regimen, before they get pregnant.

REFERRALS

- A pregnant woman with an acute epileptic seizure should be stabilised and referred from clinic/CHC to hospital for further treatment and observation.
- Mothers should be transported in a lateral semi-prone position to prevent injury.
- Secure airway breathing and circulation
- A pregnant woman with epilepsy or suspected epilepsy (no acute seizure) should be referred to the next high- risk antenatal clinic.
- A pregnant woman with recurrent seizures despite treatment should be referred to a

MANAGEMENT OF EPILEPSY IN PREGNANCY

- All women receiving anti-epileptic drugs should take 5mg folic acid daily from 12 weeks prior to conception.
- The anti-epileptic drug of choice in pregnancy is carbamazepine, lamotrigine or levetiracetam.
- Women receiving phenytoin or sodium valproate should be referred to a tertiary centre for counselling regarding effects of the drug in pregnancy.
- A baseline serum drug level is useful in early pregnancy to establish compliance and to inform future changes in drug levels. Use monotherapy with the lowest effective dose if possible.
- The dose of antiepileptic medication may need to be increased from the pre-pregnancy dose to maintain control during the pregnancy due to the increased volume of distribution.
- Prenatal fetal screening for congenital abnormalities is recommended in the first and second trimester.
- From 36 weeks add vitamin K 20 mg oral once daily (for all women on phenytoin).
- Always exclude other causes of seizures e.g. eclampsia or meningitis, even in a known epileptic.
- Treat status epilepticus as for non-pregnant women.
- Postpartum contraceptive choices must be carefully considered particularly for women on enzyme-inducing anti-epileptic drugs
- Obstetric care, labour and delivery are the same as for non-epileptic women.

THYROID DISEASE

- Women with known thyroid disease should be referred for specialist care during pregnancy
- The thyroid gland should be examined during the first booking visit;
- Women should be referred for an ultrasound examination and thyroid function tests if a goitre is suspected clinically
- Thyroid function testing is indicated for women with symptoms and signs of thyroid disease.
- These include:
- Clinical features of hyperthyroidism – heat intolerance, tachycardia, palpitations, palmar erythema, emotional lability, vomiting, goitre, weight loss, tremor, lid lag and exompthalmos
- Clinical features of hypothyroidism – weight gain, lethargy, tiredness, hair

THYROID DISEASE

Management of the neonate following delivery

- Clinical examination of the baby
- Cord blood for TSH and FT4
- If cord blood screening not performed, send formal thyroid function tests preferably after 48 hours of life (TSH and FT4).
- Discuss with specialist if abnormal.
- Hypothyroidism must be treated within the first 28 days of life due to the risk of mental impairment which is irreversible if treatment with thyroid hormones is delayed past one month

RENAL DISEASE

Acute cystitis

- Clinical features include urinary frequency, dysuria, haematuria, proteinuria and suprapubic pain
- The diagnosis is confirmed by the finding of significant bacteriuria following culture of a mid-stream urine specimen
- Antibiotic therapy is guided by the sensitivities of the organism.
- Antibiotics must be continued for 5-7 days

Acute pyelonephritis

- Clinical features include fever, loin and/or abdominal pain, vomiting, rigors, proteinuria, hematuria
- Investigations for women with fever include blood cultures, full blood count, renal function, liver function and C-reactive protein
- The diagnosis is confirmed by the finding of significant bacteriuria following culture of a mid-stream urine specimen
- Women should be admitted and treatment should start with intra-venous antibiotics, before awaiting the results of urine and blood culture or sensitivities.
- Intravenous penicillins or cephalosporins are usually the first choice.
- Antibiotics should be given intravenously for at least 24 hours, after which they may be changed to an appropriate oral formulation.
- Renal function must be checked regularly

Chronic kidney disease

- Women with known renal disease should be referred to a specialist to evaluate for the presence and severity of renal impairment, proteinuria and/or hypertension
- Women with hypertension and proteinuria prior to 20 weeks gestation should be referred for tertiary care for further work-up

Acute kidney injury

Causes

- Infection – septic abortion, puerperal sepsis
- Blood loss – postpartum haemorrhage, abruption
- Volume contraction – pre-eclampsia, hyperemesis gravidarum, diarrhoea

Management

- Treat the underlying cause. Accurate assessment of fluid balance is important.
- Fluid intake and output should be recorded hourly.
- Venous blood gas, lactate, serum creatinine and electrolytes should be measured at least twice daily.
- Treat any associated coagulopathy
- Women with deteriorating renal function or oliguria should be referred for

OBESITY IN PREGNANCY

- Women with a high BMI are at an increased risk for maternal and neonatal complications.
- The health risk is increased during antenatal, intrapartum and peripartum period.
- Assess for co-morbid conditions and look out for risk factors associated with obesity (cardiovascular disease, HDP, GDM).
- All pregnant women should have a weight, height and MUAC measurement at the first antenatal visit.

Definition

Obesity is a body mass index (BMI) ≥30kg/m2

- Class I obesity: BMI 30-34.9 kg/m2
- Class II obesity: BMI 35-39.9 kg/m2
- Class III obesity: BMI 40 and above (morbid obesity) kg/m2

Calculating the BMI

- BMI should be recorded on the antenatal card at the first visit using the pre-pregnancy weight
- If booked in the first trimester, use the first trimester weight to calculate the BMI.
- If booked in the second trimester, subtract 4kg from the weight and then calculate the BMI.

Management of obese pregnant women

Preconception

- Review history and chronic conditions, Counsel regarding pregnancy complications
- Evaluate health status, nutritional support needs, Glucose screen (pre-existing diabetes)

Antenatal

- Confirm pregnancy and gestational age, Book for detailed sonar at 20 weeks where available
- Do standard risk assessment, Screen for gestational diabetes – OGTT
- Identify women with pre-existing medical conditions, Identify women with previous adverse pregnancy outcomes
- Consider fetal growth ultrasound in third trimester - repeat as needed
- Nutritional support and counselling (refer to dietician, can be at local clinic if available)
- Management at BANC Plus and/or High Risk Clinic for BMI 40 kg/m2 and appropriate assessments should be done to decide on delivery site based on risk factors (at 36 weeks)
- Anaesthesia considerations in third trimester (anaesthetic consult prior to delivery in women with a BMI ≥ 45)

Intrapartum

- Allow for normal vaginal delivery if there are no contra-indications
- Induction of labour only for obstetric indications

Management of obese pregnant women

Postpartum

- Early mobilisation and hydration
- Graduated compression stockings if available and/or prophylactic heparin during prolonged bed rest
- Give thromboprophylaxis for women with BMI > 40 kg/m2 for up to 1 week after delivery
- Encourage breastfeeding
- Offer contraceptive advice

Antenatal care and referral routes

- BMI of < 35 kg/m2 can be managed at a MOU or BANC+ clinic if otherwise low risk.
- BMI of 35-39 kg/m2 should ideally be managed at a district hospital, or MOU if otherwise low risk.
- BMI of 40 kg/m2 or more should ideally be managed at a regional hospital or specialist outreach clinic, referred for specialist care where available.

BMI kg/m2 category	ANC site	Delivery site
BMI <35	Clinic, MOU	MOU
BMI 35-39	Clinic, MOU	MOU, District hospital
BMI 40-49	District/Regional hospital	District/Regional hospital
BMI 50+	Tertiary hospital	Tertiary hospital

SUBSTANCE ABUSE

- The antenatal period is a vital period for screening, diagnosis and treatment.
- Identify those affected and at risk and offer appropriate counselling.
- Antenatal contact must follow respectful care principles.
- Look out for multiple drug use, risk of domestic violence and other mental health concerns.
- Look out for associated maternal and neonatal adverse outcomes.
- Referral of women identified to higher level of care
- A pregnant woman with an acute overdose should be stabilised and referred from clinic/CHC to hospital for further treatment and observation.
- Mothers should be transported in a lateral semi-prone position to prevent injury.
- Secure airway breathing and circulation.
- A pregnant woman known with substance abuse should be referred to the next high-risk antenatal clinic for assessment and pregnancy review.

SUBSTANCE ABUSE

Management principles

- Counsel and educate women about risks associated with drugs/substance used
- Encourage women to decrease and ideally discontinue drug/substance
- Identify co-morbid conditions and treat sexually transmitted diseases
- Multidisciplinary team management
- Address psychosocial aspects: support systems, place of safety, look out for suicidal ideations
- Address nutrition: advise on the importance of good nutrition
- Monitor maternal and fetal status
- Pain management plan: they are more sensitive to pain, and may need high doses of analgesia
- Withdrawal symptoms: offer support care, nutrition, hydration, analgesia
- Inform paediatricians to look out for neonatal withdrawal
- Discuss risks and benefits of breastfeeding

Thank You