

# National Guideline on Antenatal and Postnatal Care in the Maldives



Ministry of Health  
Republic of Maldives



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Organization  
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# Disclaimer

The information contained in this guideline are for clinical purposes and setting a minimum standard of care. However, the ultimate judgment of any specific treatment must be made by the attending clinician in consultation with patient in light of all clinical circumstances presented with the known variability and behaviour of the disease condition.

This guideline reflects the best available data at the time the guideline was prepared. The result of future studies may require revisions to the recommendations in this guideline to reflect new data.



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# Foreword

Maldives has made progress in the establishment of health services and building a health system that yielded many successes. Based on the principles of Primary Health Care, Maldives has established a network of well-quipped hospitals on the islands, initiated key health services, and put in place policies that strive to deliver equitable, accessible and quality health care services for all its people.

Accessibility and quality of continuum of care towards mother and infant has resulted in increased health services utilization. Safe motherhood includes antenatal care, delivery care (including skilled assistance for delivery with appropriate referral for women with obstetric complications) and postnatal care, including care of the baby and breastfeeding support and their effective management leading to a remarkable reduction in the maternal and infant mortality rate.

I am confident that having guidelines and standard operating procedures and protocols developed for healthcare providers/ healthcare professionals who are directly involved in management of pregnancy, labour and birth and the postpartum period will not only strengthen the capacity building efforts, but will ensure consistency in service provision and provide mechanism for quality assurance of the services provided. In addition to this, these guidelines will improve overall outcome of maternal and child health by reducing errors through better case management and appropriate interventions, while maintaining safety, avoiding harm and ultimately build trust in delivery of maternal and childcare health services within the country further increasing the likelihood of women seeking timely care.

This national guideline and standards in the Management of pregnancy, labour and birth and the postpartum period was developed keeping in consideration the current good clinical practices, hence during the process national clinical expert advice and best practices were sought and combined with latest available scientific evidence from World Health Organization (WHO), International Federation of Gynecologist and Obstetricians (FIGO), and American College of Obstetrics and Gynecology (ACOG). This is intended for use only as a tool to assist a clinician/healthcare professional and should not be used to replace clinical judgment.

I believe this guideline and standards will help in the Management of pregnancy, labour and birth and the postpartum period and provides comprehensive evidence-based recommendations incorporating current information and practices for practitioners throughout the Health Care system. In addition, these standards and guidelines will be used for quality assessments, audits and during reviews in order to check for compliance and open opportunities for improvement.

I take this opportunity to call upon healthcare professionals to make full use of this guideline and standards as this will lead to improvement in quality and safety of healthcare provided to mother and baby throughout pregnancy, labour and birth, and the postpartum period across all health facilities in the Maldives. Furthermore, it is important for healthcare professionals to keep updating themselves with evidence-based practices and knowledge.

**Ms. Thasleema usman**  
Commissioner of Quality Assurance  
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Furthermore, acknowledge the significant role played by WHO in facilitating and assistance provided in developing and publishing the guidelines. The very initial drafts were by Health Protection Agency developed through WHO consultancy.

Additionally, the team at Quality Assurance and Regulation Division is continuously working towards improving quality and safety of healthcare provided by ensuring evidence based guidelines and standards are in place.

# List of Abbreviations

ACOG	American College of Obstetricians and Gynecology
AKI	Acute Kidney Injury
AMTSL	Active Management of Third Stage of Labour
ANC	Antenatal Care
APH	Antepartum Haemorrhage
ARM	Artificial Rupture of Membranes
BMI	Body Mass Index
CCT	Controlled Cord Traction
CFM	Continuous Fetal Monitoring
COC	Combined Oral Contraceptives
CPD	Cephalopelvic Disproportion
CRT	Cardiac Resynchronization Therapy
CS	Cesarean Section
CTG	Cardiotocograph
DFM	Decreased Fetal Movements
DV	Domestic Violence
ECV	External cephalic Version
EDD	Expected Date of Delivery
FGM	Female Genital Mutilation
FHS	Fetal Heart Sound
FIGO	International Federation of Gynecology and Obstetrics
GDM	Gestational Diabetes mellitus
GTD	Gestational Trophoblastic Disease
GWG	Gestational Weight Gain
HCG	Human Chorionic Gonadotrophin
HDU	High Dependency Unit
HELLP	Hemolysis, Elevated Liver Enzymes and Low Platelets
HELPER	Help Evaluate for episiotomy Legs (McRoberts Manoeuvre) Pressure (Suprapubic) Enter vagina (Internal maneuvers) Remove the posterior arm and Roll the patient into all fours
HIP	Hyperglycemia In Pregnancy
HIV	Human Immunodeficiency Virus

HPA	Health Protection Agency
HPE	Holoprosencephaly
ICT	Indirect Coombs Test
IOL	Induction of Labour
IUCD	Intra Uterine Contraceptive Device
IUFD	Intra Uterine Fetal Demise
IUGR	Intra Uterine Growth Restriction
IVF	Invitro Fertilization
KMC	Kangaroo Mother care
LBW	Low Birth Weight
LCG	Labour Care Guide
LMP	Last Menstrual Period
LMW	Low Molecular Weight heparin
LOT	Left Occiput Transverse
MDHS	Maldives Demographic Health Survey
MgSo <sub>4</sub>	Magnesium sulphate
MNC	Maternal Child Nutrition
NICU	Neonatal Intensive Care Unit
NIPT	Non-invasive Prenatal testing
NVP	Nausea and vomiting in pregnancy
OGTT	Oral Glucose Tolerance Test
OSA	Obstructive Sleep Apnea
PCOS	Polycystic Ovary Syndrome
PHU	Public Health Units
PID	Pelvic Inflammatory Disease
PNC	Postnatal Care
POC	Product of Conception
PPH	Postpartum Haemorrhage
PPROM	Preterm Premature Rupture of Membranes
PROM	Prelabour Rupture of Membranes
QARD	Quality Assurance and regulations Division
RHC	Reproductive Health Centre
ROT	Right Occiput Transverse
SGA	Small for Gestational Age
STI	Sexually Transmitted Infections



TORCH	Toxoplasmosis Other agents, Rubella, Cytomegalovirus, and Herpes simplex.
TTTS	Twin to Twin Transfusion Syndrome
USG	Ultrasonogram
VBAC	Vaginal Birth After Caesarean section
VTE	Venous Thrombo Embolism
WHO	World Health Organization

# CHAPTER 1

## ANTENATAL PERIOD

Topics in this chapter

- » Preconception care
- » ANC visit
- » Antenatal schedule
- » Nausea and vomiting in pregnancy



## 1.1 PRECONCEPTION

Preconception care is the provision of biomedical, behavioral and social health interventions to women and couples before conception to improve maternal and child health outcomes. According to WHO one out of three women report that their pregnancy is unplanned.

(Adapted from WHO preconception care package)

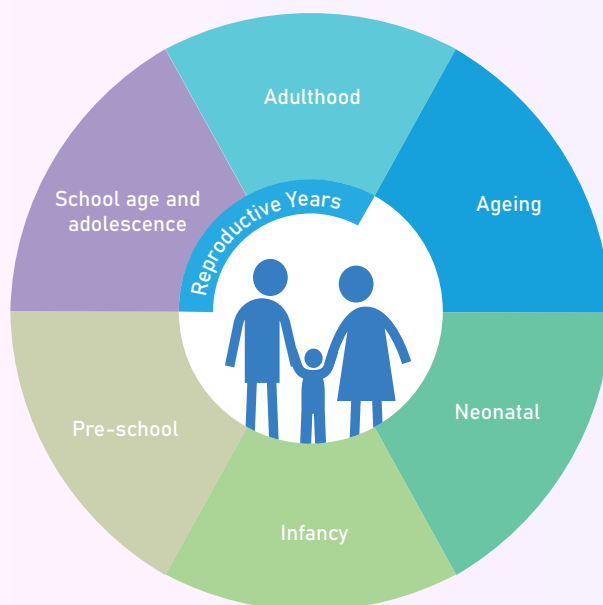


Figure 1: Preconception and pregnancy

## 1.2 AREAS TO BE ADDRESSED IN PRECONCEPTION CARE



## Nutritional condition

Information, education, and counselling



Well balanced nutritional diet



Iron and folic acid supplement



Screen for anemia and diabetes



Preconception counselling for women of reproductive age with diabetes mellitus



Promote exercise



Iodization of salt

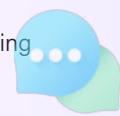


## Mental health

Assess psychosocial problems



Provide educational and psychosocial counselling before and during pregnancy



Counsel, treat, and manage depression in women planning pregnancy and other women of childbearing age



## Tobacco use

Screen women and girls for tobacco use (smoking and smokeless tobacco) at all clinical visits using "5 As" (ask, advise, assess, assist, arrange)



Provide brief tobacco cessation advice, pharmacotherapy (including nicotine replacement therapy, if available) and intensive behavioral counselling services



Screen all non-smokers (men and women) and advise about harm of second-hand smoke and harmful effects on pregnant women and unborn children



## Psychoactive substance use

Screen for substance use



Provide brief interventions and treatment when needed



Treat substance use disorders, including pharmacological and psychological interventions



Provide family planning assistance for families with substance use disorders (including postpartum and between pregnancies)



## Interpersonal violence

Recognizing signs of violence against women



Provide health care services (including post-rape care), referral and psychosocial support to victims of violence



## Genetic conditions

Take a thorough family history to identify risk factors for genetic conditions



Family planning



Genetic counselling



Carrier screening and testing



Appropriate treatment of genetic conditions



## Environmental health

Provide guidance and information on environmental hazards and prevention



Inform women of childbearing age about levels of methyl mercury in fish



## Infertility/subfertility

Create awareness and understanding of fertility and infertility and their preventable and unpreventable causes



Screen and diagnose couples attempting pregnancy, and management of underlying causes of infertility/sub-fertility, including past STIs



## Sexually Transmitted Infection (STI)

Provide age-appropriate comprehensive sexuality education and services



Promote safe sex practices through individual, group and community-level behavioural interventions



Promote condom use for dual protection against STIs and unwanted pregnancies



Screen for STIs



## Vaccine preventable diseases

Vaccination against rubella



Vaccination against tetanus and diphtheria



Vaccination against Hepatitis B



## Human Immunodeficiency Virus (HIV)

Family planning



Promote safe sex practices and dual method for birth control (with condoms) and STI control



Provider-initiated HIV counselling and testing, including male partner testing



## Female Genital Mutilation (FGM)

Screen women and girls for FGM to detect complications



Inform women and couples about complications of FGM and about access to treatment



## Guide and facilitate the woman for the following interventions

Regular consultation



Lifestyle modification



- Nutritional supplementation
- Iron supplementation
- Well-balanced nutritional diet
- Maintain normal BMI

Regular Exercise





### 1.3 ANC VISITS

Every  
4 weeks till 28 weeks

Every  
2 weeks till 36 weeks

Weekly  
after 36 weeks



## 1.4 ANTENATAL SCHEDULE

The purpose of antenatal care is to prevent or identify and treat conditions that may threaten the health of the fetus and the mother, and to help woman approach pregnancy and birth as positive experiences. The services women receive during antenatal period should include multiprofessionals so they can address both medical and social issues. Table 1 provides detailed information about the antenatal visits, investigations and treatment that the women should receive. All the pregnant mothers shall be given Antenatal Record book (see appendix 1 for Antenatal Record Book). Information on this book shall be obtained from the mother and documented in the relevant sections in each visit.

Table 1: Antenatal schedule

Contact	Gestational Age	Clinical examinations	Investigations	Medications/ advice	Follow up
1	(Missed periods to 8 weeks)  First contact after confirming pregnancy by UPT or serum bHCG	<ul style="list-style-type: none"> <li>» Fill ANC card in full detail completing medical surgical and obstetric history, psychosocial history</li> <li>» Initial comprehensive clinical assessment including pallor, BMI, vitals &amp; systemic examination.</li> <li>» Thalassaemia status of both partners</li> <li>» Smoking history</li> </ul>	<ul style="list-style-type: none"> <li>» Full Blood Count, platelet, RBS, urine RE and CS</li> <li>» Blood group and typing</li> <li>» G6PD</li> <li>» Screening for HIV, HbsAg, HCV, VDRL &amp; vitamin-D</li> <li>» USG for fetal viability and dating</li> <li>» If indicated TSH, fT3, fT4, OGTT &amp; HbA1C</li> </ul>	<ul style="list-style-type: none"> <li>» T. Folic acid 400 micrograms once daily</li> <li>» Consider iron calcium supplement</li> <li>» Health education on healthy eating and physical activity</li> </ul>	<ul style="list-style-type: none"> <li>» Follow up with reports</li> <li>» Next visit at 8-12 weeks</li> </ul>

Contact	Gestational Age	Clinical examinations	Investigations	Medications/ advice	Follow up
2	8-12 weeks	<ul style="list-style-type: none"> <li>» Confirmation of EDD by correlation with radiological expected date of delivery.</li> <li>» Urine dipstick – protein and glucose</li> <li>» Pallor, BP, Weight</li> <li>» Ask about fetal movement</li> <li>» Urine dipstick – urine for protein and glucose</li> </ul>	<ul style="list-style-type: none"> <li>» USG for early anomaly scan (between 11-14 weeks)</li> <li>» (NT and NB) and dating</li> <li>» Optional prenatal screening for chromosomal abnormalities (NIPT and double marker)</li> </ul>	<ul style="list-style-type: none"> <li>» T. Folic acid 400 micrograms OD</li> <li>» Start iron calcium supplement (after 12 weeks)</li> <li>» Health education</li> <li>» Healthy eating and physical activity</li> </ul>	<ul style="list-style-type: none"> <li>» Next ANC visit at 15-17 weeks.</li> <li>» Review previous investigation reports</li> </ul>
3	15-17 weeks	<ul style="list-style-type: none"> <li>» Pallor, BP, Weight</li> <li>» Fundal height</li> <li>» Ask about fetal movement</li> <li>» Urine dipstick – urine for protein and glucose</li> </ul>	<ul style="list-style-type: none"> <li>» Review for medical termination as per fatwa (IFA/2013/06).</li> </ul>	<ul style="list-style-type: none"> <li>» Continue iron and calcium supplement</li> </ul>	<ul style="list-style-type: none"> <li>» Next visit 18-24 weeks</li> </ul>
4	18-24 weeks	<ul style="list-style-type: none"> <li>» Pallor, BP, Weight, Fundal height, FHS</li> <li>» Ask about fetal movement</li> <li>» Urine dipstick – urine for protein and glucose</li> </ul>	<ul style="list-style-type: none"> <li>» Detailed anomaly scan for Structural abnormalities</li> <li>» OGTT (24-28weeks)</li> <li>» HbA1c</li> <li>» Full blood count</li> <li>» urine R/E and CS</li> <li>» ICT in Rh negative mothers</li> </ul>	<ul style="list-style-type: none"> <li>» T Iron (30-60mg elemental iron) once daily</li> <li>» T Calcium 1000mg once daily</li> <li>» Review tetanus toxoid immunization and offer booster dose</li> <li>» Consider Albendazole 400mg stat</li> </ul>	<ul style="list-style-type: none"> <li>» Next visit at 28weeks</li> </ul>

Contact	Gestational Age	Clinical examinations	Investigations	Medications/ advice	Follow up
5	28-32 weeks	<ul style="list-style-type: none"> <li>» Pallor, BP, Weight</li> <li>» Fundal height</li> <li>» FHS</li> <li>» Ask about fetal movement</li> <li>» Ask about fetal movement</li> <li>» Urine dipstick – urine for protein and glucose</li> </ul>	<ul style="list-style-type: none"> <li>» Review reports: OGTT, HbA1c</li> <li>» If ICT negative then Anti-D 1st dose at 28weeks (repeat at 34 weeks)</li> </ul>	<ul style="list-style-type: none"> <li>» T Iron (30 to 60mg elemental iron) once daily</li> <li>» T. Calcium 1000mg once daily</li> <li>» Review tetanus toxoid immunization and offer booster dose</li> </ul>	<ul style="list-style-type: none"> <li>» Next ANC visit at 32 to 34 weeks</li> </ul>
6	32-34 weeks	<ul style="list-style-type: none"> <li>» Pallor, BP, Weight</li> <li>» Fundal height</li> <li>» FHS</li> <li>» Ask about fetal movement</li> <li>» Ask about fetal movement</li> <li>» Urine dipstick – urine for protein and glucose</li> </ul>	<ul style="list-style-type: none"> <li>» Scan for growth and placental localization</li> </ul>	<ul style="list-style-type: none"> <li>» T. Iron (30-60mg elemental iron) once daily</li> <li>» T. Calcium 1000mg once daily</li> <li>» Anti-D prophylaxis second dose for Rh negative mothers</li> <li>» Educate mother to recognize change in fetal movements</li> </ul>	<ul style="list-style-type: none"> <li>» Next 34 weeks</li> </ul>
7	34-36 weeks	<ul style="list-style-type: none"> <li>» Pallor, BP, Weight</li> <li>» Fundal height</li> <li>» FHS</li> <li>» Ask about fetal movement</li> <li>» Urine dipstick – urine for protein and glucose</li> </ul>	<ul style="list-style-type: none"> <li>» Full blood count <ul style="list-style-type: none"> <li>◊ Fasting blood sugar</li> <li>◊ Post prandial blood sugar,</li> <li>◊ HbA1c and urine RE</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>» T.Iron (30-60mg elemental iron) once daily</li> <li>» T. Calcium 1000mg once daily</li> <li>» Educate mother to recognize change in fetal movements</li> </ul>	<ul style="list-style-type: none"> <li>» Next ANC visit at 37 weeks</li> </ul>

Contact	Gestational Age	Clinical examinations	Investigations	Medications/ advice	Follow up
8	37 weeks	<ul style="list-style-type: none"> <li>» Pallor, BP, Weight</li> <li>» Fundal height</li> <li>» FHS</li> <li>» Ask about fetal movement</li> <li>» Urine dipstick</li> <li>» protein and glucose</li> </ul>	<ul style="list-style-type: none"> <li>» Review reports:</li> <li>» USG for fetal well-being</li> </ul>	<ul style="list-style-type: none"> <li>» T Iron (30- 60mg elemental iron) once daily</li> <li>» T. Calcium 1000mg once daily</li> <li>» Fetal kick count charting at home</li> <li>» Explain danger signs</li> <li>» Birth preparedness</li> </ul>	<ul style="list-style-type: none"> <li>» Next ANC visit at 38 weeks with reports</li> </ul>
9	38 weeks	<ul style="list-style-type: none"> <li>» Pallor, BP, Weight</li> <li>» Fundal height</li> <li>» FHS</li> <li>» Ask about fetal movement</li> <li>» Urine dipstick – urine for protein and glucose</li> <li>» Pelvic assessment</li> </ul>	<ul style="list-style-type: none"> <li>» Review reports:</li> </ul>	<ul style="list-style-type: none"> <li>» T. Iron (30-60mg elemental iron) once daily</li> <li>» T. Calcium 1000mg once daily</li> <li>» Fetal kick count charting at home</li> <li>» Explain danger signs</li> <li>» Birth preparedness</li> </ul>	<ul style="list-style-type: none"> <li>» Next ANC visit at 39 weeks</li> </ul>
10	38 weeks	<ul style="list-style-type: none"> <li>» Pallor, BP, Weight</li> <li>» Fundal height</li> <li>» FHS</li> <li>» Ask about fetal movement</li> <li>» Urine dipstick – urine for protein and glucose</li> </ul>	<ul style="list-style-type: none"> <li>» Review reports:</li> </ul>	<ul style="list-style-type: none"> <li>» T Iron (30-60mg elemental iron) once daily</li> <li>» T. Calcium 1000mg once daily</li> <li>» Fetal kick count charting at home</li> <li>» Explain danger signs</li> <li>» Birth preparedness</li> </ul>	<ul style="list-style-type: none"> <li>» Next ANC visit at 40 weeks</li> <li>» Delivery plan</li> </ul>

Contact	Gestational Age	Clinical examinations	Investigations	Medications/ advice	Follow up
11	40 weeks	<ul style="list-style-type: none"> <li>» Pallor, BP, Weight</li> <li>» Fundal height</li> <li>» FHS</li> <li>» Ask about fetal movement</li> <li>» Urine dipstick – urine for protein and glucose</li> <li>» Pelvic assessment</li> </ul>	<ul style="list-style-type: none"> <li>» Review reports:</li> </ul>	<ul style="list-style-type: none"> <li>» T. Iron (30-60mg elemental iron) once daily</li> <li>» T. Calcium 1000mg once daily</li> <li>» Fetal kick count charting at home</li> <li>» Explain danger signs</li> <li>» Birth preparedness</li> </ul>	<ul style="list-style-type: none"> <li>» Delivery plan</li> </ul>

### Delivery at 41 weeks if not given birth

#### HIGHLY RECOMMENDED

The following are highly recommended assessments that the clinicians should be inquiring about while treating pregnant women.



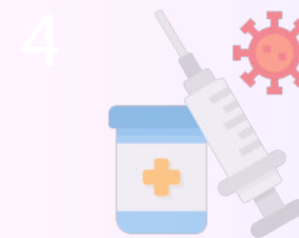
1  
Clinical inquiry about the possibility of intimate partner violence/DV/substance abuse (violence can be in the form of physical, sexual, emotional, Psychological and financial)



2  
Smoking history and counseling on smoking cessation including partner



3  
Prenatal diagnosis for fetus affected by thalassaemia major and medical termination of pregnancy before 120 days of pregnancy (as per Fatwa IFA/2013/06).



4  
Influenza vaccine (strongly recommended)



## 1.5 NAUSEA AND VOMITING IN PREGNANCY (NVP)

Nausea and vomiting affects majority of pregnant women. This mostly starts at 6th to 8th weeks of pregnancy and in most women nausea and vomiting stop by 2nd trimester. Women should be reassured that this is not associated with a poor pregnancy outcome.

Hyperemesis gravidarum is prolonged nausea and vomiting leading to dehydration, ketosis, electrolyte derangement and in severe cases weight loss.

NVP should only be diagnosed when onset is in the first trimester of pregnancy and other causes of nausea and vomiting have been excluded.



### 1.5.1 Pregnancy related causes of excessive vomiting

Can occur in normal pregnancy



Multiple pregnancy



Molar pregnancy



### 1.5.2 Investigations

Urine for Ketone bodies



Full blood count



Blood for urea and electrolytes



Thyroid function test



Urine for RE and culture



Liver function test



obstetric ultra sound



*Note: Special investigations for mild nausea and vomiting in pregnancy are not required.*

1

### Neurologic complications

- Wernicke's encephalopathy due to thiamine deficiency
- Pontine myelinolysis
- Peripheral neuritis
- Korsakoff's psychosis

2

Stress ulcer in stomach

3

Oesophageal tear (Mallory-Weiss syndrome)

4

Jaundice

5

Convulsions

6

Renal failure

7

Coma

## 1.5.3 Management



Exclude other causes of vomiting



Ginger, chamomile, vitamin B6 and acupuncture are recommended for the relief of nausea and vomiting in early pregnancy

### In Hyperemesis Gravidarum

- » Fluid replacement
- » Nil Orally
- » Correct dehydration with isotonic fluids ((Normal Saline 0.9% and Ringer lactate/AVOID dextrose containing fluids)
- » Correct electrolyte imbalance cautiously
- » Thiamine supplementation
- » Antiemetics



### Recommended antiemetic therapies and dosages

- » Doxinate 1 tab 8hourly PO
- » Promethazine 12.5-25mg 8 hourly for PO/IM/IV
- » Metoclopramide 10mg 8 hourly (maximum 5days duration)
- » Domperidone 10mg 8 hourly
- » Ondansetron 4mg 6-8hourly PO, 8mg over 15minutes 12 hourly IV
- » Corticosteroids: Hydrocortisone 100mg twice daily IV and once clinical improvement occurs convert to Prednisolone 40-50mg daily PO with the dose gradually taper



*Note: Clinicians should use Antiemetics which they are familiar with, in the minimum effective dose*

### 1.5.4 Counselling and support

- » Avoid empty stomach
- » Specific diet advice is given based on patient's ability to tolerate food prepared at home
- » Avoid odors and food that trigger nausea and vomiting
- » Avoid deep fried food and eat small regular meals when vomiting is severe (include bland dry carbohydrates like toast and crackers)
- » Take solid food rather than taking liquid in early morning
- » Reassurance and psychological support from family and health professionals to the pregnant woman that this phase will improve often alleviates anxiety

## CHAPTER 2

# MEDICAL CONDITIONS IN PREGNANCY

Topics in this chapter

- » Pyrexia in pregnancy
- » Anaemia
- » Obesity
- » Hypertensive disorders in pregnancy
- » Hyperglycemia in pregnancy
- » Cardiac disease in pregnancy



## 2.1 PYREXIA IN PREGNANCY

Fever is defined as temperature 38°C or more during pregnancy or labour.



### 2.1.1 Clinical manifestation and management of pyrexia in pregnancy

Table 2: Signs and symptoms of pyrexia in pregnancy

Sign and symptoms	Cause	Investigations	Management
<ul style="list-style-type: none"><li>» Dysuria</li><li>» Increased frequency and urgency of urination</li></ul>	Cystitis	Urine microscopy (Showing white cells in clumps, bacteria and RBCs) and culture sensitivity if available	<ul style="list-style-type: none"><li>- Symptomatic management (e.g. use of urinary alkalisers)</li><li>- Safe use of oral antibiotics as per culture report</li></ul>
<ul style="list-style-type: none"><li>» Dysuria</li><li>» Spiking fever/chills</li><li>» Increased frequency and urgency of urination</li><li>» Abdominal pain</li></ul>	Acute pyelonephritis	Urine microscopy (Showing white cells in clumps, bacteria and RBCs) and culture sensitivity if available	<ul style="list-style-type: none"><li>- Start antibiotic. without waiting for culture report. Ampicillin 2gm IV stat and 1 gm 6 hourly</li><li>- Ensure adequate hydration</li><li>- Give Paracetamol 500mg orally as needed for pain and to lower temperature</li><li>- Refer to a specialist</li></ul>

Sign and symptoms	Cause	Investigations	Management
<ul style="list-style-type: none"> <li>» Foul-smelling vaginal discharge in first 22 weeks</li> <li>» Fever and Tender uterus</li> </ul>	Septic abortion		Refer to specialist
<ul style="list-style-type: none"> <li>» fever, sore throat, cold, cough, runny nose, nasal congestion</li> </ul>	URTI	Chest X-ray (with abdominal shield)	<ul style="list-style-type: none"> <li>- Symptomatic management</li> <li>- Hydration</li> <li>- Antihistamines (Cetirizine and Fexofenadine)</li> <li>- Paracetamol</li> </ul>
<ul style="list-style-type: none"> <li>» Fever</li> <li>» Difficulty in breathing</li> <li>» Cough with expectoration</li> <li>» Chest pain</li> </ul>	Pneumonia	CXR (with abdominal shield)	<ul style="list-style-type: none"> <li>Iv antibiotics</li> <li>Steam inhalation</li> <li>Refer to specialist</li> </ul>
<ul style="list-style-type: none"> <li>» Sudden high-grade fever</li> <li>» Facial flushing</li> <li>» Skin erythema</li> <li>» Generalized body ache</li> <li>» Myalgia, arthralgia</li> <li>» Headache</li> </ul>	Dengue	<ul style="list-style-type: none"> <li>- Full Blood count, LFT, Electrolytes,</li> <li>- NS1 Antigen,</li> <li>- Dengue IgG and IgM</li> </ul>	<ul style="list-style-type: none"> <li>- Adequate hydration</li> <li>- Multidisciplinary care</li> <li>- Monitor for warning signs</li> </ul>
<ul style="list-style-type: none"> <li>» Fever</li> <li>» Malaise</li> <li>» Anorexia</li> <li>» Nausea</li> <li>» Dark urine and pale stool</li> <li>» Yellow skin and sclera</li> </ul>	Hepatitis	LFT Hepatitis virus panel	Refer to specialist

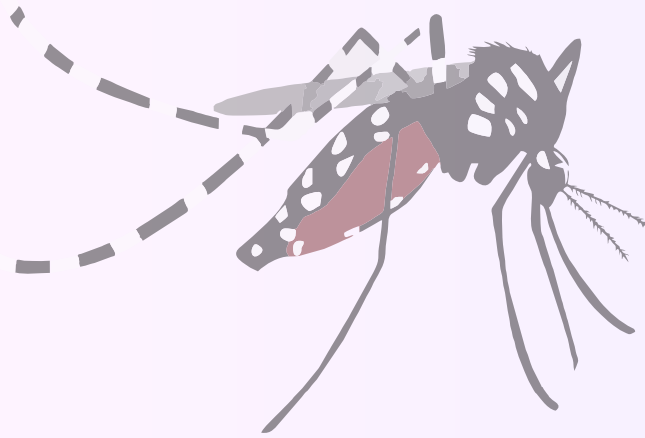


*Flu vaccination against influenza is recommended during pregnancy regardless of gestational age depending on availability of vaccine.*

## 2.1.2 Dengue fever

### *Effects of dengue fever on pregnancy and delivery*

- » Based on the severity of the disease, intrauterine fetal death can occur.
- » If infection occurs before delivery, there can be vertical transmission and baby may have symptoms of thrombocytopenia, fever, hepatomegaly and circulatory disorders.
- » At the time of delivery, bleeding can occur due to thrombocytopenia
- » Refer to figure 2 and 3 for classification and management of dengue fever in pregnancy



### 2.1.2.1 Diagnosis and classification

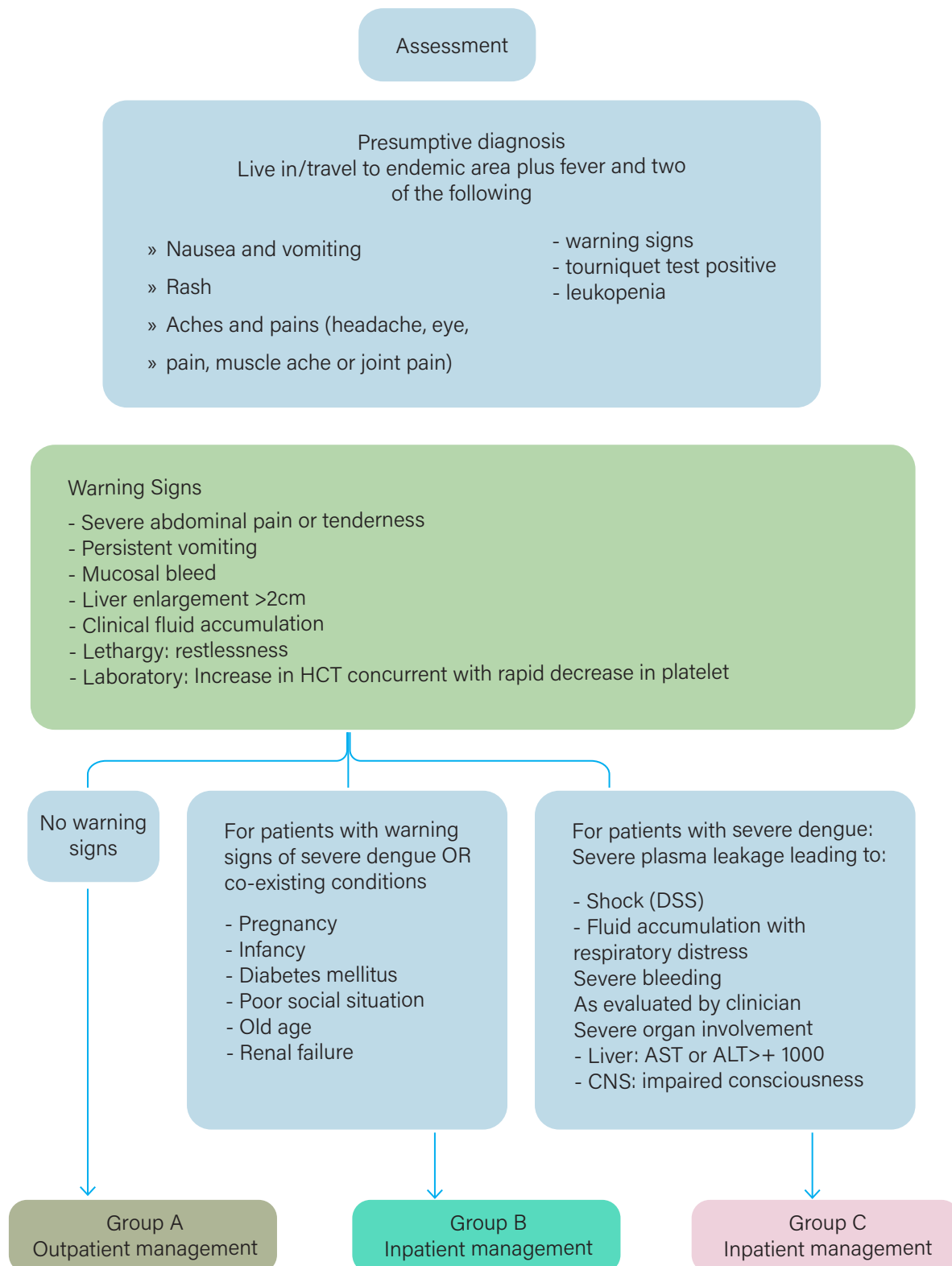


Figure 2: Diagnosis of dengue fever. Adapted from CDC guideline Dengue case management



## Group B- Inpatient management for dengue patients with WARNING SIGNS

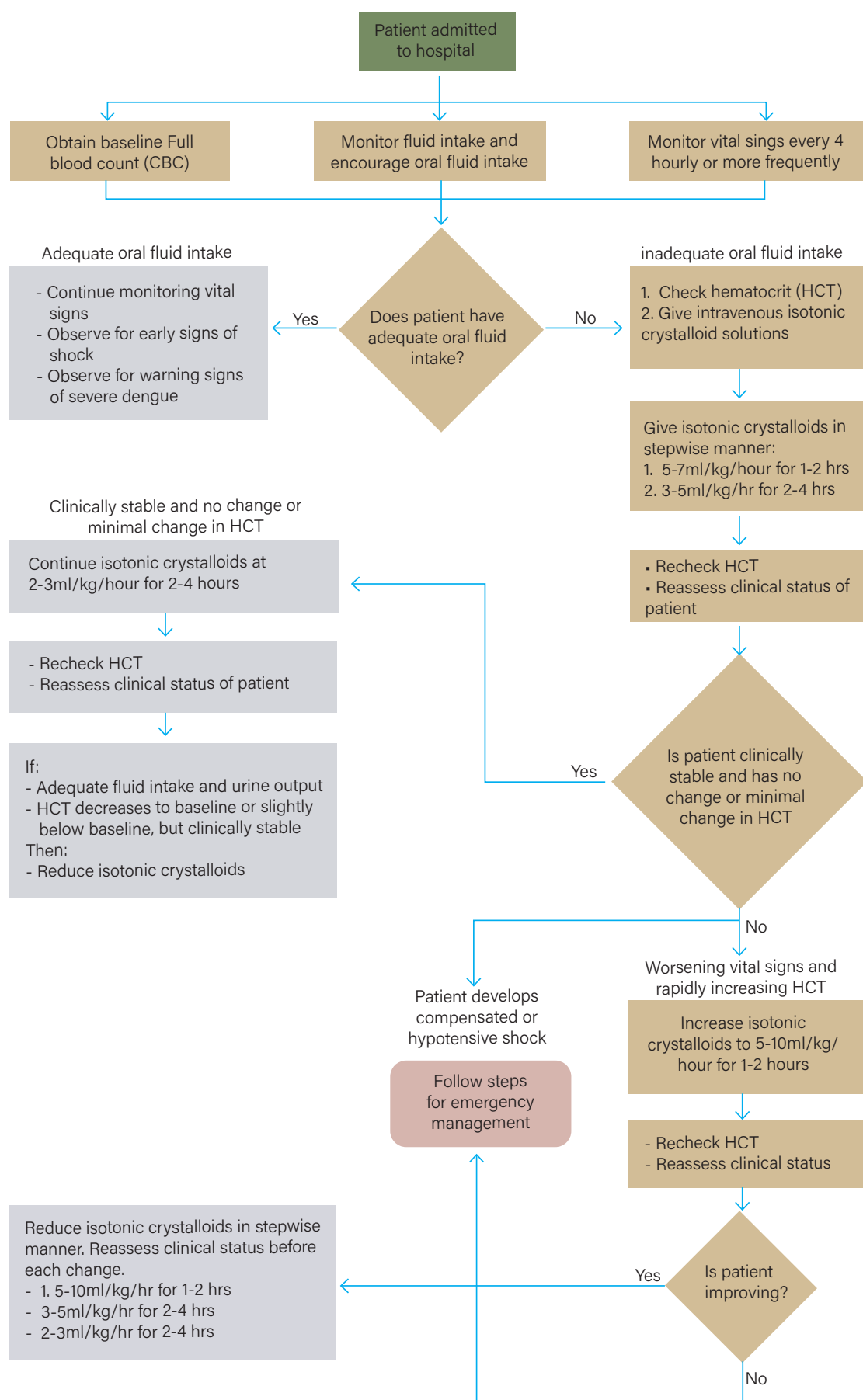
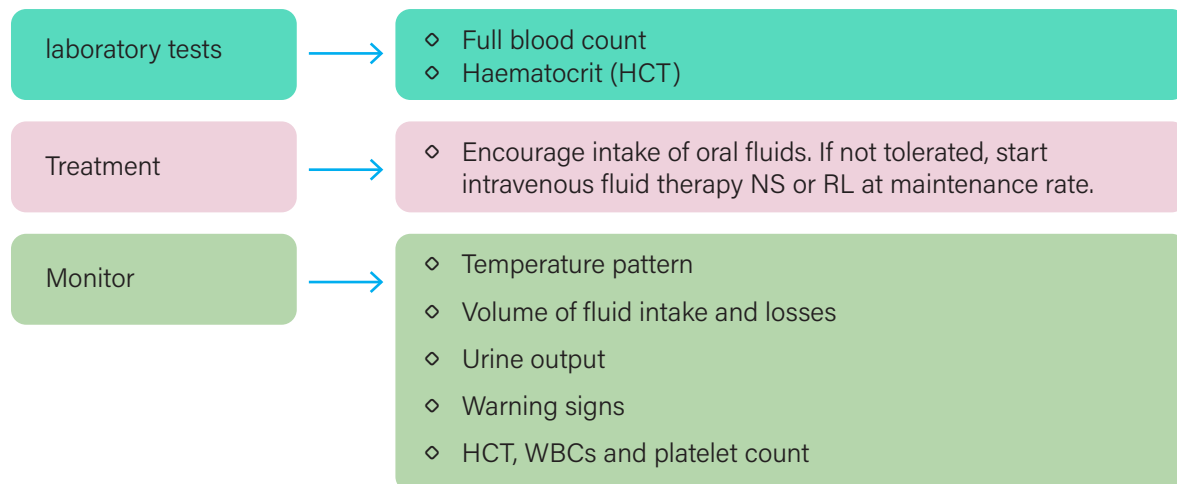


Figure 3: management of dengue patient with warning

### 2.1.2.2 Management during delivery

- » Avoid delivery during the critical phase, if possible
- » Monitor carefully.



#### Severe dengue (requiring emergency treatment)

##### Features:

- » Severe plasma leakage with shock and/ or fluid accumulation with respiratory distress
- » Severe bleeding
- » Severe organ impairment
- » Laboratory tests:
  - » Complete blood counts
  - » Haematocrit
  - » Other organ function tests as indicated

#### **Treatment of compensated shock:**

- » Start IV fluid resuscitation with isotonic crystalloid solutions at 5-10 ml/kg/hour over 1 hour.
- » Reassess patient's condition:
  - ◇ If patient improves, IV fluids should be reduced gradually and maintained for up to 24-48 hours
  - ◇ If patient is still unstable:
  - ◇ Check HCT after first bolus
  - ◇ If HCT increases/ still high(>50%)- repeat a second bolus of crystalloid solution - If there is improvement- reduce rate of IV fluids
  - ◇ If HCT decreases, this indicates bleeding – transfuse blood

#### **Treatment of hypotensive shock:**

- » Initiate IV fluid resuscitation with crystalloid or colloid solution
- » Reduce fluids gradually if patient improves
- » If patient remains unstable:
  - ◇ Review the HCT- if low – transfuse; if high- change to colloids
- » Treatment of haemorrhagic complications:
  - ◇ Give 5-10ml/kg of fresh packed red cells or 10-20ml/kg of fresh whole blood

- » If possible, deliver vaginally. Patients who will undergo delivery usually require platelet transfusions to improve platelet counts to at least 50,000/mm<sup>3</sup>
- » If a Caesarean section is required, give platelet concentrates pre-operatively, perioperatively, as well as post-operatively, if necessary. Keep platelet count above 75,000/mm<sup>3</sup>
- » Prior to surgery, perform consultations with a team of anaesthesiologist, neonatologist and cardiologist.

### **2.1.3 Communicable disease notification**

When diagnosis is confirmed, all communicable disease should be notified to Health Protection Agency (HPA). See form in appendix 2.

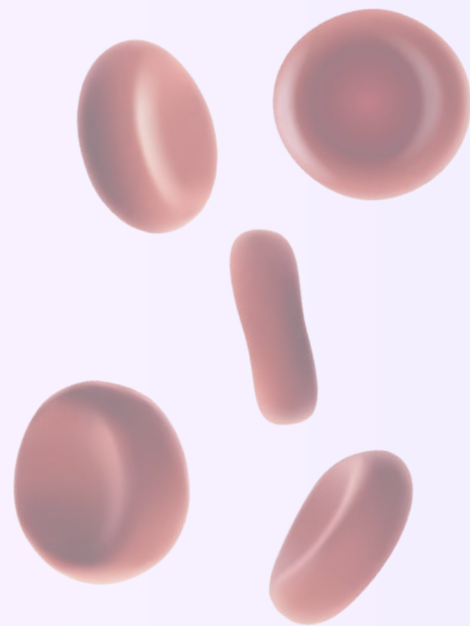
## 2.2 ANAEMIA IN PREGNANCY

Anemia is defined as Hb less than 2 standard deviations below the mean for a healthy matched population. The World Health Organization reference is Hemoglobin concentration of <11g/dl. Maldives Demographic and Health Survey (MDHS) 2016-2017 showed that almost two in three women, aged 15-49 (63%) were anemic. There is also a high prevalence of Thalassemia in Maldives.

Women with mild or moderate anemia often tend to be asymptomatic and anemia is detected on screening alone. Early diagnosis and treatment reduces symptoms and the need for blood transfusion.

### 2.2.1 Causes

- » Nutritional - Iron, Folate, Vit B12 deficiencies
- » Hemoglobinopathies – Thalassemia, Sickle cell disease
- » Malabsorption of iron
- » Acute or chronic blood loss (H/O heavy menses, Gastrointestinal bleeding)
- » Infections – worm infestation
- » Chronic diseases
- » Hemolytic anemia



### 2.2.2 Signs and symptoms

- » Exhaustion or weakness
- » Anorexia and indigestion
- » Palpitation
- » Pruritis (iron deficiency anaemia)
- » Dyspnea on exertion
- » Giddiness
- » Swelling of legs
- » Systolic murmurs



### 2.2.3 Investigations

- » FBC
- » Peripheral blood smear
- » Iron profile
- » Stool routine and occult blood



### 2.2.4 Classification of anaemia

Table 3: classification of anemia

<b>Category 1</b> Severity of Anemia <b>Mild</b> Hemoglobin Level g/dl 9.5-10.5	<b>Category 2</b> Severity of Anemia <b>Moderate</b> Hemoglobin Level g/dl 8.0-9.4	<b>Category 3</b> Severity of Anemia <b>Severe</b> Hemoglobin Level g/dl 6.9-7.9	<b>Category 4</b> Severity of Anemia <b>Very severe</b> Hemoglobin Level g/dl <6.9
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### 2.2.5 Management

#### Antenatal

- » FBC at booking visit, 20 weeks, 28 weeks and at term
- » Patient with anemia may require more frequent reviews
- » Growth of the fetus should be monitored for Small for Gestational Age (SGA) babies
- » Dietary advice
- » Encourage to include rich sources of iron include heme iron and non-heme iron.
- » Heme iron (meat, tuna and egg yolk)
- » Non-heme iron (Dry fruits, dark green leafy vegetables and iron fortified cereals, spinach, beans, "Massaagu fai", drumstick leaves, legumes and lentils)
- » Encourage intake of iron with Vitamin C (orange, lemon juice) to improve its absorption
- » Foods that inhibit iron absorption including tannins in tea, coffee, bran, calcium foods should not be taken with iron rich foods.
- » Consider Anthelminthic (T. Albendazole orally at 18-24 weeks)



### Intrapartum

- » Crossmatch blood in patients with moderate or severe anemia
- » Close monitoring of blood pressure, pulse rate, pulse oximetry
- » Active management of 3rd stage of labour
- » Prevention of PPH



### Postpartum

- » Continue iron supplementation
- » Maintain postpartum Hb at 10g/dl
- » Contraception and spacing before subsequent pregnancy



## 2.3 OBESITY IN PREGNANCY

Overweight and obesity are defined as abnormal or excessive fat accumulation that presents a risk to health. Maldivian Demographic Health Survey (DHS 2016-2017), shows that half of women aged 15–49 years are overweight or obese (With a BMI of 25 or over)

All pregnant women should have their weight and height measured using appropriate equipment, and their BMI calculated at the antenatal booking visit. Measurements should be recorded in the handheld notes and electronic patient information system.

### 2.3.1 Classification

Table 4: Classification of BMI

Classification	BMI (kg/m <sup>2</sup> )
Under weight	<18.50
Normal range	18.50-24.99
Over weight	25.00-29.99
Obesity:	
Obese class 1	30.00-34.99
Obese class 11	35.00-39.99
Obese class 111/morbid obesity	≥40.00
Super	>50

Note: At the time of booking BMI must be calculated and classified according to the table below

Table 5: Weight gain recommendations during pregnancy

BMI (kg/m <sup>2</sup> )		Increase in weight throughout 1st trimester (1 - 12 weeks)	Average & range of weight gain recommended for 2nd & 3rd trimesters (13 - 40 weeks)	Recommended weight gain (kg)
Under weight	less than 18.5	0.5 - 2.0 kg	0.5kg / week (0.44 - 0.58kg)	12-18
Normal range	18.5-24.9		0.4kg / week (0.35 - 0.50kg)	11-15
Over weight	25.0-29.9		0.3kg / week (0.23 - 0.33kg)	6-11
Obesity	30 and above		0.2 kg / week (0.17 - 0.27kg)	5-9

Public Health Unit (PHU) and Reproductive Health Centers (RHC) should aim to assist on weight and lifestyle modification during preconception counselling or contraceptive consultations. Weight and BMI should be measured to encourage women to optimize their weight before pregnancy.

Women of childbearing age with increased BMI should receive information about the risks of obesity during pregnancy and childbirth. Support women to lose weight before conception and between pregnancies. Inform women that weight loss between pregnancies reduce the risk of stillbirth, hypertensive complications and fetal macrosomia. Weight loss increases the chances of successful Vaginal Birth After Caesarean (VBAC) section.

2.3.2 Complications of obesity

Table 6: Complications of obesity in mothers and babies.

Complications of obesity for mothers	Complications of obesity for babies
<ul style="list-style-type: none"><li>» Miscarriage</li><li>» Gestational diabetes</li><li>» Preeclampsia</li><li>» Venous thromboembolism</li><li>» Induction of labour</li><li>» Dysfunctional or prolonged labour</li><li>» Caesarean section</li><li>» Anaesthetic complications</li><li>» Postpartum Haemorrhage (PPH)</li><li>» Shoulder dystocia</li><li>» Wound infection</li><li>» Mortality</li><li>» Difficulty in initiating and maintaining breastfeeding</li><li>» Puerperal urinary tract infections</li></ul>	<ul style="list-style-type: none"><li>» Congenital anomalies (fetal neural tube defects)</li><li>» Still births</li><li>» Prematurity</li><li>» Macrosomia</li><li>» Neonatal death</li><li>» Childhood obesity and metabolic disorders</li></ul>

2.3.3 Management

Table 7: Management of obesity in pregnancy

Pre- and inter-conception	
<ul style="list-style-type: none"><li>» Comprehensive health assessment</li><li>» Discuss health impacts and options</li><li>» Consider referral to dietitian</li><li>» Aim to normalize weight</li><li>» Higher dose folic acid daily</li></ul>	<ul style="list-style-type: none"><li>» Personalized approach to weight concern and lifestyle</li><li>» Post Barriatric Surgery (BS): micronutrient supplements and monitoring</li><li>» Identify/optimize comorbidities (e.g., diabetes mellitus)</li></ul>



## Antenatal

### Antenatal

- » Early antenatal booking-in
- » Measure BMI pre-pregnancy
- » Use correctly sized BP cuff
- » If BS: micronutrient supplements/monitoring

### Refer as required

- » Psychosocial wellbeing
- » Mental health

### Discuss

- » Lifestyle options, healthy eating and physical activity
- » GWG and consider weight gain chart use

### Consider risk of

- » Pre-eclampsia – low dose aspirin
- » Venous Thrombo Embolism (VTE) and need for thromboprophylaxis

## Labour and birth

- » Early assessment of IV access
- » If prophylactic antibiotics, consider higher dosage
- » Surveillance for shoulder dystocia/PPH
- » Active management of third stage of labour

## Postpartum

- » Surveillance for airway compromise
- » Early mobilization
- » Assess risk of VTE and consider thromboprophylaxis
- » Risk of wound infection
- » Additional support for breastfeeding
- » Healthy lifestyle support

## 2.4 HYPERTENSIVE DISORDERS IN PREGNANCY

Hypertension in pregnancy is systolic blood pressure  $\geq 140$  mmHg and/or diastolic blood pressure 90 mmHg (Korotkoff 5). The blood pressure readings should be documented on at least two occasions 15 mins apart, after resting for more than 10 mins with an appropriate cuff size.

### 2.4.1 Classification

Table 8: International Society for the Study of Hypertension in Pregnancy classification (ISSHP, 2018)

1	<b>Chronic hypertension:</b> If hypertension occurs before 20 weeks of gestation or persists for more than 12 weeks postpartum.
2	<b>Gestational hypertension:</b> hypertension arising de novo after 20 weeks' gestation in the absence of proteinuria and without biochemical or hematological abnormalities. It is usually not accompanied by fetal growth restriction. Outcome is usually good with gestational hypertension. Some women though who present at <34 weeks may progress to preeclampsia and have poorer outcomes.
3	<b>Preeclampsia</b> De novo or superimposed on chronic hypertension
4	<b>White-coat hypertension</b> Refers to elevated office/clinic ( $\geq 140/90$ mmHg) BP, but normal BP measured at home or work ( $<135/85$ mmHg), there is an increased risk for preeclampsia.
5	<b>Masked hypertension:</b> BP that is normal at a clinic or office visit but elevated at other times, most typically diagnosed by 24-hour ambulatory BP monitoring (ABPM) or automated home BP monitoring.
6	<b>Proteinuria</b> is not mandatory for a diagnosis of preeclampsia. It is diagnosed by the presence of de novo hypertension after 20 weeks' gestation accompanied by proteinuria and/or evidence of maternal Acute Kidney Injury (AKI), liver dysfunction, neurological features, hemolysis or thrombocytopenia, or fetal growth restriction. Preeclampsia may develop or be recognized for the first time intrapartum or early postpartum in some cases.
7	The Hemolysis, Elevated Liver Enzymes, Low Platelets (HELLP) syndrome is a (serious) manifestation of preeclampsia and not a separate disorder.

## 2.4.2 Abnormal Proteinuria in Pregnancy

- » Dipstick urinalysis. If positive ( $\geq 1+$ , 30 mg/dL), then urine protein/creatinine (Pr/Cr) ratio can be performed.
- » Pr/Cr ratio  $\geq 30$  mg/mmol (0.3 mg/mg) is abnormal.
- » Proteinuria is not required for a diagnosis of preeclampsia.
- » Massive proteinuria ( $>5$  g/24 hour) is associated with more severe neonatal outcomes.



## 2.4.3 Risk factors for Preeclampsia

### Risk factors for preeclampsia

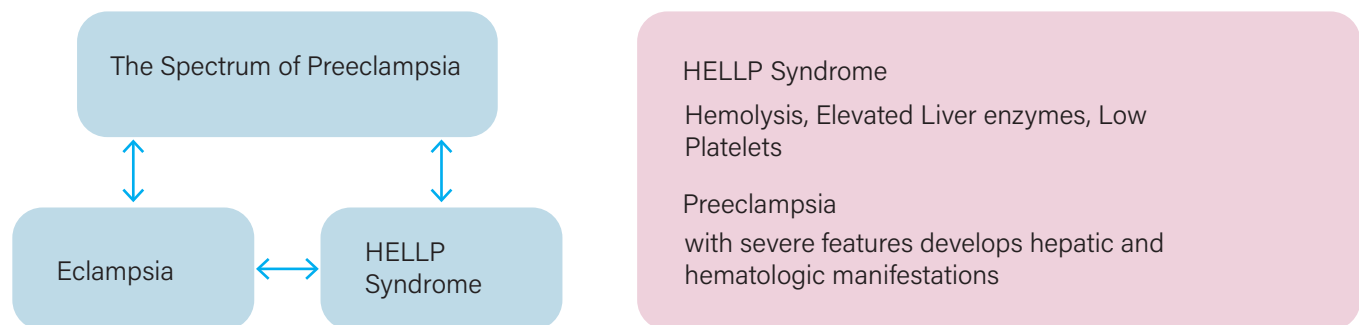
- 1 Chronic hypertension
- 2 Previous history of preeclampsia
- 3 Family history of preeclampsia
- 4 Pregestational / gestational diabetes
- 5 Maternal age  $>40$  years
- 6 Pre-pregnancy BMI  $>30$ kg/m<sup>2</sup>
- 7 Nulliparity
- 8 Antiphospholipid syndrome
- 9 Thrombophilia
- 10 Systemic lupus erythematosus
- 11 Multiple pregnancy
- 12 Gestational trophoblastic disease
- 13 Assisted reproductive technology
- 14 Pre-existing medical conditions:
  - a. Renal disease
  - b. Chronic autoimmune disease
  - c. Congenital heart defects
  - d. Depression or anxiety disorders

## 2.5 PREECLAMPSIA

Hypertension after 20 weeks of LMP with or without proteinuria on dipstick urinalysis, and one or more signs of end-organ damage:

- » Severe headache, tinnitus
- » Visual disturbances
- » Epigastric pain, nausea, vomiting
- » Hyperreflexia (overactive knee-jerk response, twitching and spasms)
- » Oliguria (urine output < 400 ml/day or < 30 ml/hour)
- » Pulmonary oedema
- » Thrombocytopenia (platelet count < 100 000/mm<sup>3</sup>)
- » Renal impairment (serum creatinine level > 1.1 mg/dl)
- » Altered hepatic function (elevated transaminases over twice the normal value)

### 2.5.1 The Spectrum of Preeclampsia



*HELLP syndrome can occur without hypertension or proteinuria*

## 2.5.2 Management of hypertension in pregnancy

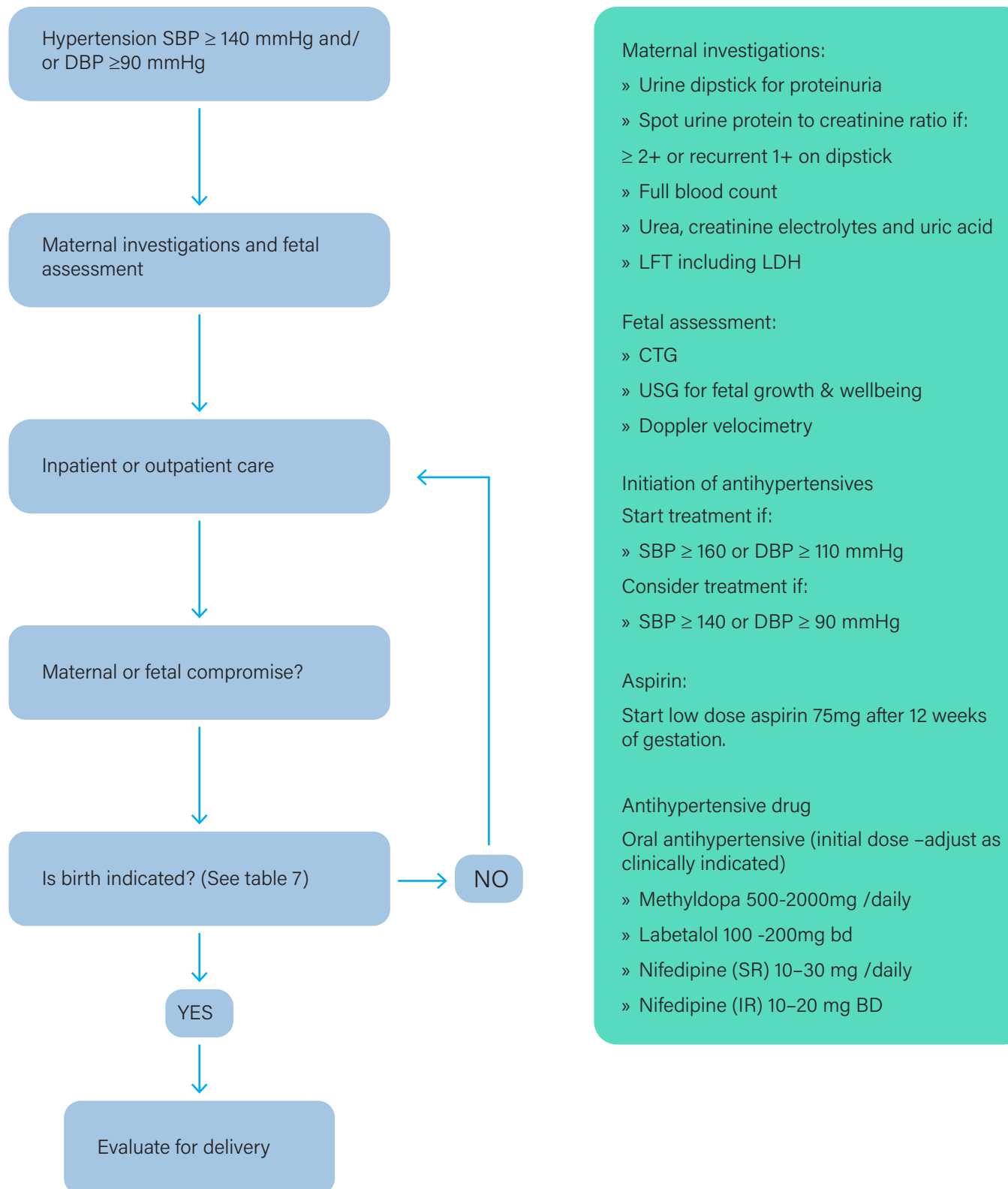


Figure 4: Management of hypertension in pregnancy

Table 9: Indications to consider

Indications to consider	
1	Non-reassuring fetal status
2	Severe fetal growth restriction
3	Uncontrollable pre-eclampsia
4	Eclampsia
5	Uncontrollable hypertension
6	Placental abruption
7	Acute pulmonary oedema
8	Deteriorating platelet count, liver and/or renal function
9	Persistent neurological symptoms
10	Persistent epigastric pain, nausea or vomiting with abnormal liver function tests

### 2.5.3 Management of severe hypertension and preeclampsia

When managing hypertension and eclampsia in in-patient and out-patient care, The following are important to consider

Table 10: Management of hypertension and preeclampsia

1	Multidisciplinary team approach	6	Consider corticosteroids if preterm labour anticipated
2	Possible HDU	8	FBC, platelet, LFT including urea, creatinine& LDH
3	Strict control of BP	9	Coagulation screen
4	Maternal and fetal assessments	10	Urine for protein
5	Consider magnesium sulphate	11	Consider transfer to higher level facility, if required
7	Strict fluid management		

Table 11: Management of hypertension and preeclampsia

#### Outpatient care:

- » If mild-moderate hypertension
- » Without preeclampsia
- » Individualize appointments
- » Consider admission if:
  - o Fetal wellbeing is of concern
  - o SBP  $\geq 150$  mmHg or
  - o DBP  $\geq 100$  mmHg or
- » Symptoms of pre-eclampsia, or proteinuria or pathology results abnormal

#### Inpatient monitoring:

- » BP 4 hourly or accordingly
- » Urine albumin daily/twice daily
- » Maintain accurate fluid balance
- » Bedrest is not recommended
- » Consider VTE prophylaxis

#### Stabilize prior to birth:

- » Control hypertension
- » Correct coagulopathy
- » Consider eclampsia prophylaxis
- » Attention to fluid status

#### Postpartum

- » Close clinical surveillance for postpartum hypertension
- » Consider VTE prophylaxis
- » Consider timing of discharge
- » Arrange follow up

### 2.5.4 Management of eclampsia

#### Follow resuscitation principles

D – Dangers  
 B – Breathing  
 R – Response  
 C – Compressions  
 S – Send for Help  
 D – Defibrillation  
 A – Airway

#### Treat hypertension

- » If: systolic BP  $\geq 160$  mmHg or diastolic BP  $\geq 110$  mmHg
- » Aim to reduce SBP to 130–150 mmHg and DBP to 80–90 mmHg
- » Avoid maternal hypotension
- » Monitor FHR
- » Follow table 11 for types of drugs and their dosages

Table 12: Dosage of drugs

Drug Initial dose	Class	Usual effective dose range	Maximum total daily dose	Contraindication	Side effects
<b>Nifedipine</b> » 5mg -10mg stat oral, repeat after 30 minutes	Calcium channel blocker	30-90mg daily in divided doses	120mg	Severe Aortic stenosis	Headache in first 24 hours Flushing, Tachycardia, Peripheral oedema, Constipation
<b>Methyl dopa</b> » 250mg 2-4 times daily, increase every 2 days as needed	Centrally acting alpha agonist	250mg 500mg 4 times a day	2000mg	Depression	Slow onset of action over 24 hours, dry mouth, sedation, depression, blurred vision
<b>Labetalol</b> » Initially 20 mg IV bolus over 2 minutes » Repeated doses 40-80 mg IV every 10 minutes to maximum of 300 mg if required	Combined Beta Blocker with mild alpha vasodilator effect	200 to 800mg in 2 divided doses	2400mg	Asthma, Chronic airways obstruction Heart failure Bradycardia heart block	Bradycardia, bronchospasm, headache, nausea, scalp tingling (labetalol only) which usually resolves within 24 hours
<b>Hydralazine</b> » 5-10 mg IV over 3-10 minutes » Maximum dose 30 mg	Peripheral vasodilator	50 to 100mg in 2-4 divided doses	200mg		Flushing, headache, nausea, lupus-like syndrome



## 2.6 ECLAMPSIA

Occurrence of new-onset generalized, tonic-clonic seizures or coma in a patient with preeclampsia.

### Clinical manifestations

- » Convulsions.
- » Diastolic blood pressure 90 mm Hg or more after 20 weeks gestation.
- » Proteinuria  $\geq 1+$  on Dipstick.
- » And sometimes: Altered sensorium or loss of consciousness.
- » Other symptoms and signs of severe preeclampsia.



*Note: A small proportion of women with eclampsia have normal blood pressure.  
Treat all women with convulsions as if they have eclampsia until another diagnosis is confirmed.*

### 2.6.1 Delivery

#### Delivery should take place

within 24 hours, either vaginally or by caesarean section, depending on the state of the cervix, gestational age, and the condition of the fetus.



## 2.6.2 Management of eclampsia

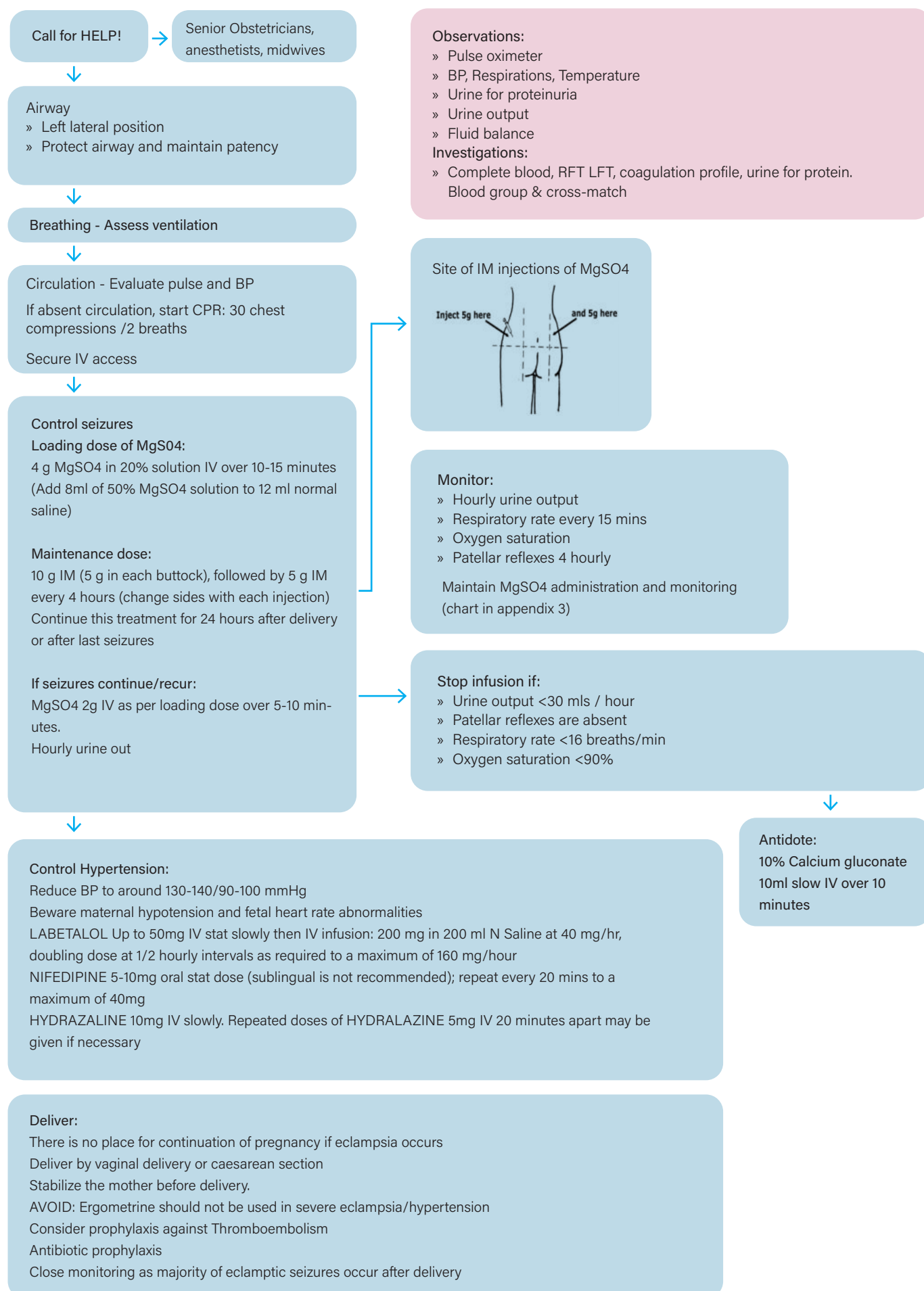


Figure 5: Management of eclampsia

### 2.6.3 Postpartum Care

#### Monitor

- » Blood pressure every 15 minutes
- » Urine output and urine protein
- » Urine for protein should be checked
- » Close vigilance for signs and symptoms for impending eclampsia
- » Home blood pressure monitoring or at health centers
- » Contraceptive counselling and birth spacing
- » Long term follow – up advise for development of chronic hypertension



*Next pregnancy: Low dose of Aspirin prophylaxis after 12 weeks of gestation*



## 2.7 HYPERGLYCEMIA IN PREGNANCY

Hyperglycemia In Pregnancy (HIP) is defined as carbohydrate intolerance resulting in hyperglycemia of variable severity with onset or first recognition during pregnancy. Worldwide, one in 10 pregnancies is associated with diabetes, 90% of which are GDM.

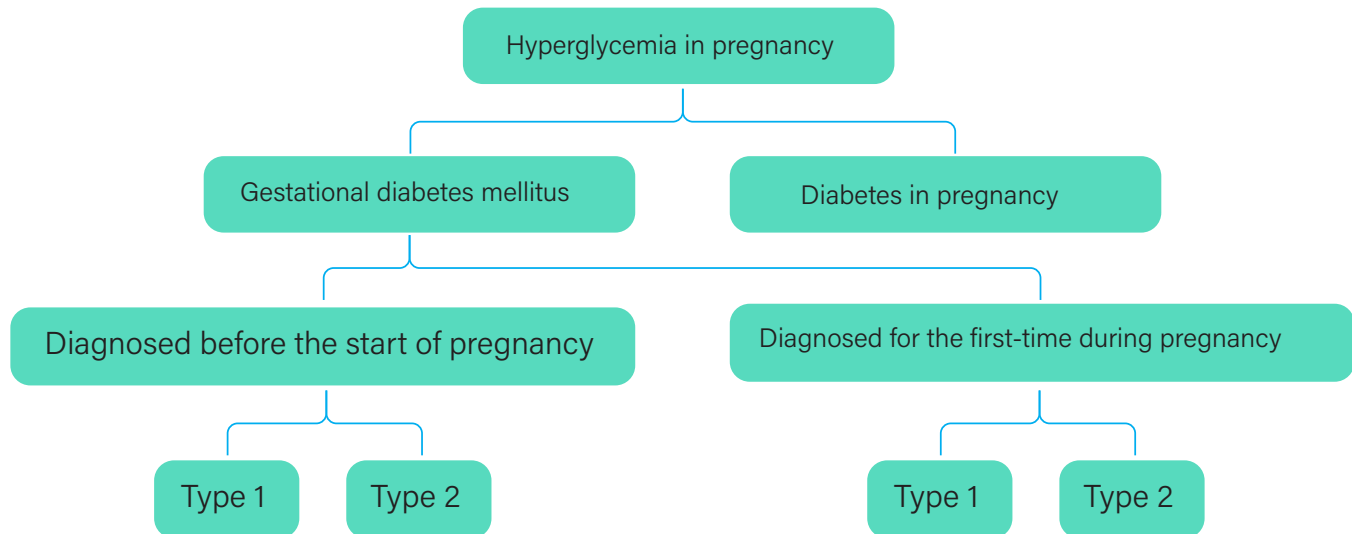


Figure 6: Types of hyperglycemia in pregnancy

### 2.7.1 Difference between diabetes in pregnancy and gestational diabetes

Diabetes in pregnancy	Gestational diabetes mellitus
Pregnancy in previously known diabetes	Hyperglycemia during pregnancy that is not diabetes
OR Hyperglycemia diagnosed for the first-time during pregnancy that meets WHO criteria for diabetes mellitus in the nonpregnant state	Hyperglycemia diagnosed for the first-time during pregnancy
May occur anytime during pregnancy including the first trimester	May occur anytime during pregnancy but most likely after 24 weeks

## 2.7.2 Risk factors

- » Pre-pregnancy BMI >30kg/m<sup>2</sup>
- » Significant weight gain in between pregnancies, or excessive Gestational Weight Gain (GWG) during the first 18 to 24 weeks of pregnancy.
- » Previous macrosomic baby 4kg or more
- » Previous gestational diabetes (GDM in previous pregnancy has 40 percent risk of recurrence)
- » Family history of diabetes (first degree relative with diabetes)
- » Personal history of impaired glucose tolerance, HbA1C ≥6.5 percent, impaired fasting glucose,
- » Older maternal age (especially >40 years of age)
- » Medical condition/any other condition associated with development of diabetes, such as polycystic ovary syndrome (PCOS)
- » Bad obstetric history
  - Recurrent miscarriages
  - H/o unexplained intrauterine death
  - Congenital anomalies-neural tube defects, cardiac defects.

## 2.7.3 Screening for GDM

Being South Asian and pregnant places Maldivian women at a higher risk for hyperglycemia in pregnancy. Therefore, universal screening should be done in the first antenatal visit and at 24–28 weeks of gestation in pregnant women not previously known to have diabetes. The diagnosis of GDM is made when any of the following is met or exceeded.

### Glucose Tolerance Test (GTT)

- Oral glucose tolerance test with 75g glucose has been accepted as the diagnostic tool for GDM.
- Ensure woman has been fasted for at least 8 hours.
- Take fasting blood glucose.
- Dilute 75g of glucose in 250ml of water and drink immediately.
- Repeat blood glucose level is checked 1<sup>st</sup> hour and 2<sup>nd</sup> hour
- There is no need to check for glycosuria during the blood taking.

The WHO diagnostic criteria for diabetes and impaired glucose tolerance are shown in table 12.

Table 13 : Diagnosis of GDM

Diabetes	FPG $\geq$ 126mg/dL	OGTT 2-hour PG $\geq$ 200mg/dL
Impaired fasting glucose (IFG)	Impaired fasting glucose (IFG)	OGTT 2-hour PG $<$ 140mg/dL
Impaired glucose tolerance (IGT)	FPG $<$ 126mg/dL	OGTT 2-hour PG (140mg/dL-200mg/dL)

#### 2.7.4 Monitoring HbA1c

- » Measure HbA1c levels at the booking appointment for all pregnant women with pre-existing diabetes, to determine the level of risk for the pregnancy
- » Consider measuring HbA1c levels in the second and third trimesters of pregnancy for women with pre-existing diabetes, to assess the level of risk for the pregnancy
- » Level of risk for the pregnancy for women with pre-existing diabetes increases with an HbA1c level above 48 mmol/mol (6.5%).
- » Do not routinely use HbA1c levels to assess a woman's blood glucose control in the second and third trimesters of pregnancy.



#### 2.7.5 Complications

##### GDM

- » Significant maternal and fetal complications if untreated
- » More prone to develop preeclampsia, poly-hydramnios, infections, prolonged and obstructed labor, higher chances of caesarean delivery and PPH
- » Fetal risks are of macrosomia, intra uterine fetal death
- » Increased risk of developing type 2 diabetes later in life

##### Pregestational diabetes

- » Risk of ketoacidosis
- » Congenital malformations mainly central nervous system, cardiac, skeletal and gastrointestinal tract and renal. Caudal regression syndrome is the most specific fetal malformation.
- » Neonatal hypoglycemia

## 2.7.6 Management of GDM

With regard to the management of impaired glucose tolerance, the current approach is aggressive lifestyle modification. It should be in accordance with available national resources.

### Aim:

- Frequent follow up
- Antenatal care in collaboration with multidisciplinary team. (Obstetrician, physician and dietician)
- Self-monitoring blood glucose for all pregnant women with diabetes.

### Recommendation for Antenatal supervision with HIP

- GDM with well-controlled plasma sugar levels without any complications: routine antenatal care
- With uncontrolled plasma sugar levels or any complication of pregnancy: every 2 weekly visits in second trimester every week in third trimester
- Nuchal Translucency (NT) scan at 12-13 weeks
- A fetal anomaly scan with cardiac evaluation by USG: at 22 - 24 weeks
- Woman is counselled to keep record of daily fetal movement counts as there are higher chances of unexplained intra uterine fetal death
- Refer to higher center for ANC checkup and delivery latest by 36 weeks if sugars controlled
- Minimum monthly check-ups with healthcare provider knowledgeable in diabetes in pregnancy.
- Periodic clinical and sonographic growth assessments from diagnosis until term. Use CTG and /or BPP or kick-count chart as indicated accordingly.
- Follow recommendations in figure 7 for mode and time of delivery

## Timing and mode of delivery in women with HIP

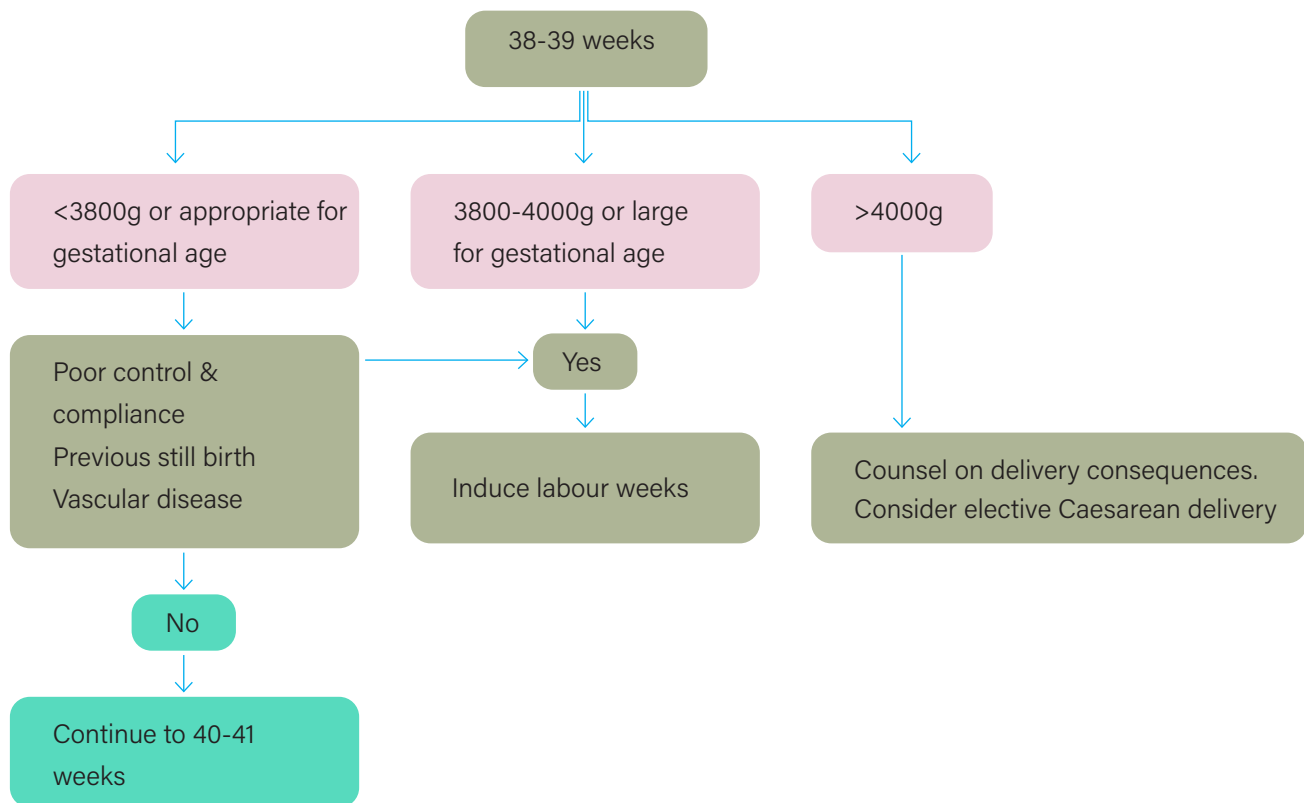


Figure 7: Recommendations for timing and mode of delivery in women with HIP (as per hospital protocol or as suggested below). Source: FIGO initiative 2017



## 2.7.7 Diet and nutritional therapy

### Nutritional therapy

- » Diet plan with visit to dietician
  - ◇ 60: 20: 20 carbohydrate: protein: fat
  - ◇ Regular exercise for 30 minutes daily
- » Blood glucose is reassessed for 2–3 days with checking of FBS, premeal and post meal monitoring (1–2 hours)
- » If it fails, i.e. FBS  $\geq 90$ mg/dL and/ or postmeal  $\geq 120$ mg/dL → start insulin or oral hypoglycemic agents
- » If blood sugars are in range, wait for another 2 weeks and reassess
- » Recommended calorie intake:
  - ◇ Underweight: 35–40 kcal/kg
  - ◇ Normal weight: 30–35 kcal/kg
  - ◇ Overweight: 25–30 kcal/kg



### Recommended Weight Gain in Pregnancy

- » Normal BMI (19.8–26.0 kg/m<sup>2</sup>) → 11.4–15.9 kg
- » Overweight (BMI 26.1–29.0 kg/m<sup>2</sup>) → 6.8–11.4 kg
- » Obese women (BMI >29 kg/m<sup>2</sup>) → upto 7 kg



### Recommended Calorie Intake According to Trimester

- » 1st trimester → no increase in calories
- » 2nd trimester → an additional 340 kcal/day
- » 3rd trimester → an additional 452 kcal/day



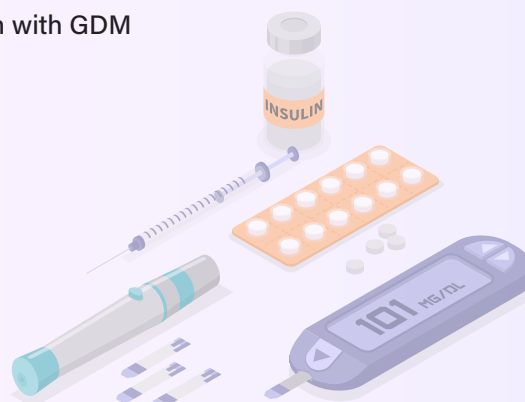
## 2.7.8 Pharmacologic management

It is preferred if lifestyle modification alone fails to achieve glucose control as safe and treatment options for GDM.

### Recommendations for pharmacological treatment in women with GDM

Insulin, glyburide and metformin are safe and effective therapies for GDM during second and third trimesters and maybe initiated as first-line treatment after failing to achieve glucose control with lifestyle modification.

Insulin should be considered as the first-line treatment in women with GDM who are at high risk of failing oral antidiabetic drug therapy, and not achieving target plasma glucose level.



### Recommendations for glucose monitoring in women with GDM:

1. Self-monitoring of blood glucose is recommended for all pregnant women with diabetes, 3-4 times a day:
  - ◇ Fasting: once daily, following at least 8 hours of overnight fasting
  - ◇ Postprandial: 2-3 times daily, 1 or 2 hours after the onset of meals, rotating meals on different days of the week.
2. Self- monitoring of blood glucose is recommended for all pregnant women with diabetes at least once daily, with documented relation to timing of meal. See appendix 4 for blood sugar profile.



## Algorithm for diagnosis and management of pre-gestational and gestational diabetes in pregnancy

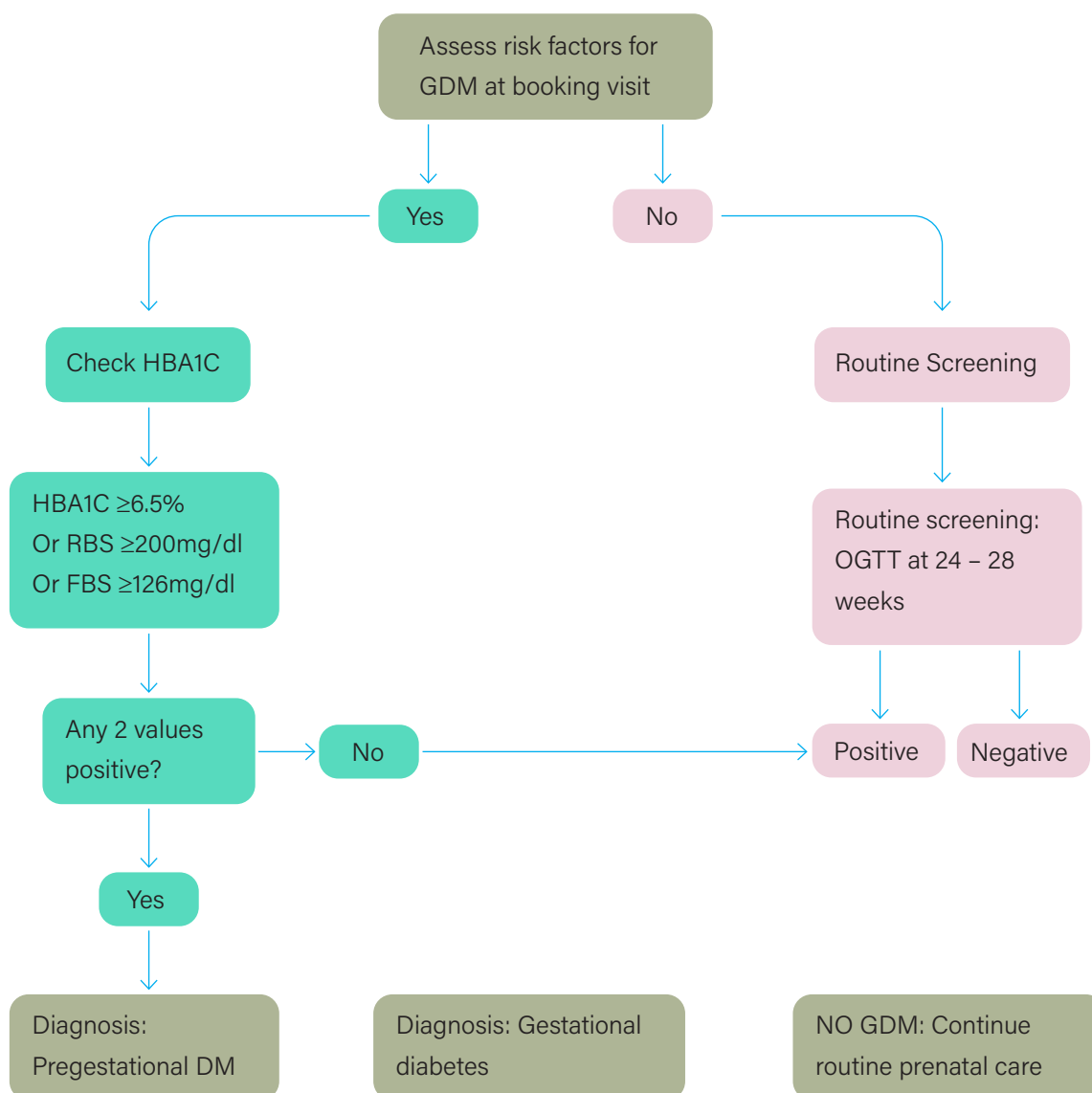


Figure 8: Algorithm for diagnosis of Pregestational and Gestational Diabetes in Pregnancy

### Immediate neonatal care

- » Early breast feeding
- » Monitor for hypoglycemia (capillary blood glucose  $< 44\text{mg/dl}$ ).
- » Evaluate for other neonatal complications like respiratory distress, convulsions and hyper-bilirubinemia.



### 2.7.9 Postnatal follow-up

- » Immediate postpartum care in GDM is not different from women without GDM but women are at high risk to develop Type 2 Diabetes mellitus in future.
- » Subsequently, 75 g GTT at 6 weeks postpartum is to be done to evaluate glycemic status of woman and management is recommended accordingly.
- » All these women are counselled for healthy lifestyle, diet and exercise



### 2.7.10 Preconception planning and care

Provide information, advice and support, to reduce the risks of adverse pregnancy outcomes for mother and baby.

Explain to women with diabetes who are planning a pregnancy that if they have good blood glucose control before conception and throughout their pregnancy, this will reduce the risk of miscarriage, congenital malformation, stillbirth and neonatal death. But it should be explained that the risks can be reduced but not eliminated.

When women with diabetes are planning a pregnancy, provide them and their families with information about how diabetes affects pregnancy and how pregnancy affects diabetes. The following information to be provided:

- » The role of diet, body weight and exercise
- » The risks of hypoglycemia and impaired awareness of hypoglycemia during pregnancy
- » How nausea and vomiting in pregnancy can affect blood glucose control
- » The increased risk of having a baby who is large for gestational age, which increases the likelihood of birth trauma, induction of labor, and instrumental and caesarean section deliveries
- » The need for diabetic retinopathy and nephropathy assessment before and during pregnancy.
- » the importance of maternal blood glucose control during labour and birth, and the need for early feeding of the baby, in order to reduce the risk of neonatal hypoglycemia
- » the possibility of that the baby may have health problems in the first 28 days, and may need admitting to a neonatal unit
- » The risk of the baby developing obesity, diabetes and/or other health problems in later life.



## 2.8 CARDIAC DISEASE IN PREGNANCY

Cardiac disease is the commonest cause of indirect maternal mortality. The common disorders are rheumatic valvular disease, congenital heart diseases and cardiomyopathy. If the patient is a diagnosed case of heart disease or there is a clinical suspicion, she should be immediately referred to a centre where there is a provision of combined care by an physician and a cardiologist.

### 2.8.1 General physical examination

- » Pallor/icterus → anemia exacerbate angina and failure
- » Clubbing,
- » Cyanosis,
- » Lymphadenopathy
- » Goitre
- » Pyrexia
- » Edema
- » CVS examination
- » Auscultation (see table 14 for normal findings in a pregnant woman)



Table 14: Auscultation - normal findings in a pregnant woman

### Auscultation - normal findings in a pregnant woman

- » S1 loud/ or splitting
- » S2 may increase late in pregnancy
- » Ejection systolic murmur may present (due to hyperkinetic circulation of pregnancy) at 10 - 12weeks and disappears during postpartum
- » Mammary "soufflé" → due to increase blood flow in mammary vessels (may be heard as systolic or continuous murmur)
- » Arrhythmias/ectopic beats (both atrial and ventricular) → they only appear during exertion because of tachycardia.



## 2.8.2 Clinical manifestations

The following are clinical manifestations of cardiac diseases in pregnancy.

Table 15: How to differentiate common signs and symptoms of normal pregnancy versus those that are abnormal and indicative of underlying cardiac disease

	Routine care	Caution	Stop
	Reassurance	Nonemergent Evaluation	Prompt Evaluation Pregnancy Heart Team
History of CVD	None	None	None
Self-reported symptoms	None or mild	Yes	Yes
Shortness of breath	No interference with activities of daily living: with heavy exertion only	With moderate exertion, new onset asthma, persistent cough, or moderate or severe OSA	At rest: paroxysmal nocturnal dyspnea or orthopnea; bilateral chest infiltrates on CXR or respiratory pneumonia.
Chest pain	Reflux related those resolves with treatment	Atypical	At rest or with minimal exertion
Palpitations	Few seconds, self-limited	Brief, self-limited episodes: no lightheadedness or syncope	Associated with near syncope
Syncope	Dizziness only with prolonged standing or dehydration	Vasovagal	Exertional or unprovoked
Fatigue	Mild	Mild or moderate	Extreme
Vital signs HR (beats per minute)	Normal <90	90-119	≥120
Systolic BP (mmHg)	120-139	140-159	≥160 (or symptomatic low BP)
PP (per minute)	12-15	16-25	≥25
Oxygen saturation	>97%	95-97%	<95% (unless chronic)
Physical examination	Normal		
JVP	Not visible	Not visible	Visible > 2cm above clavicle
Heart	S3, barely audible soft systolic murmur	S3, systolic murmur	Loud systolic murmur, diastolic murmur, S4
Lungs	Clear	Clear	Wheezing, crackles, effusion
Edema	Mild	Moderate	Marked

Adapted from ACOG – 2019, Pregnancy and Heart Disease

### 2.8.3 Management Principles

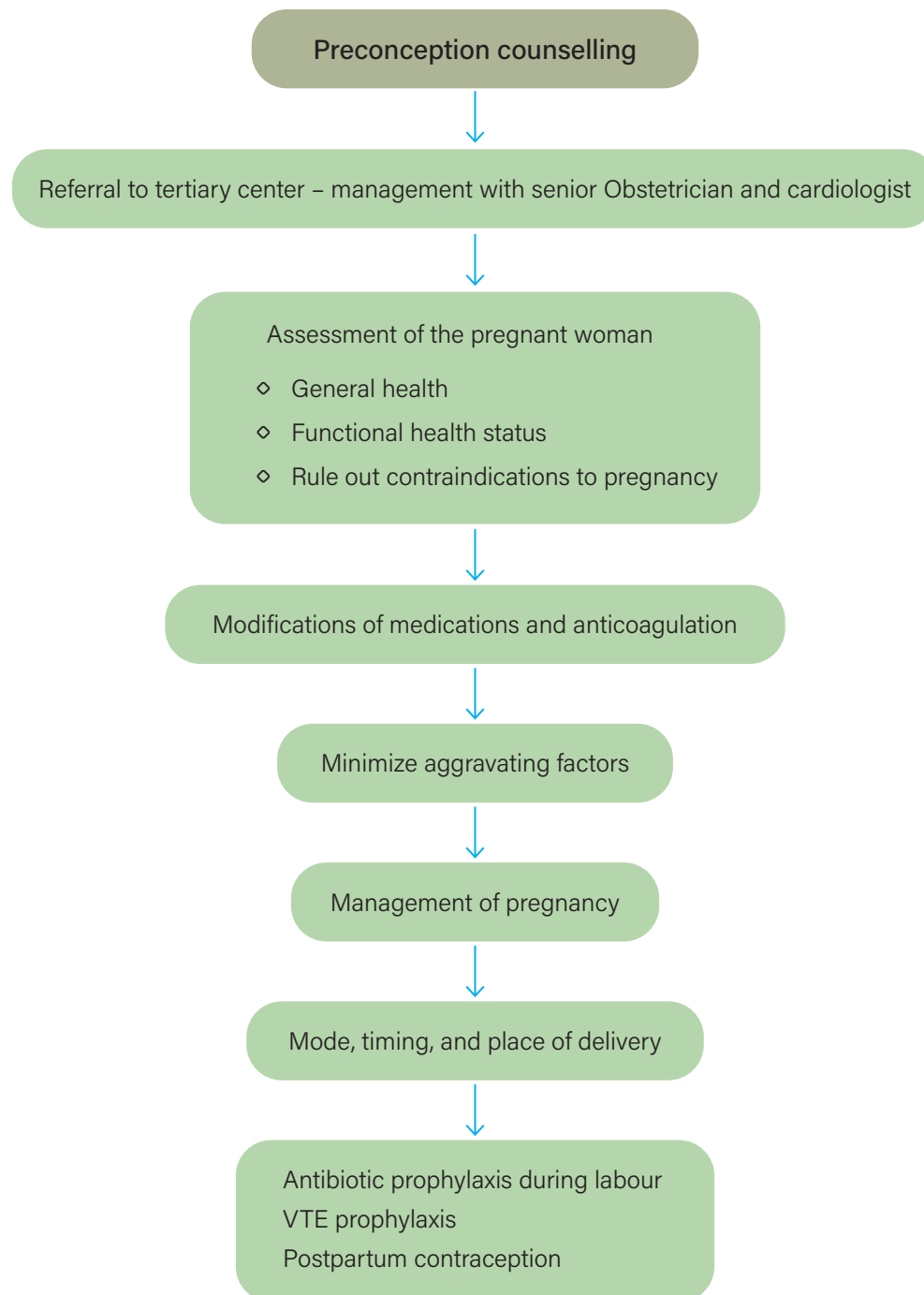


Figure 9: Management principles of women with underlying heart disease.

## 2.8.4 Preconception counselling

- » Obtain old records, previous cardiovascular testing, and interventions.
- » Women with known cardiovascular disease should be evaluated by a cardiologist before pregnancy or soon after pregnancy for an assessment of the effect of pregnancy on the underlying cardiovascular disease and to assess the potential risks to the woman and fetus.
- » If pregnancy is contraindicated, appropriate contraceptive counseling
- » To optimize the underlying cardiac condition prior to pregnancy
- » Patients with moderate to high-risk cardiovascular diseases should managed during pregnancy, delivery, and the postpartum period in a cardiac tertiary center.



Table 16: Modified World Health Organization (WHO) classification of maternal cardiovascular risk

WHO Pregnancy Risk Classification (Risk of pregnancy by medical condition)	Cardiovascular Conditions by WHO Risk Class
<b>WHO Risk Class I</b> No detectable increased risk of maternal mortality and no or mild increase in morbidity.	<ul style="list-style-type: none"> <li>» Uncomplicated, small or mild               <ul style="list-style-type: none"> <li>◇ Pulmonary stenosis</li> <li>◇ Patent ductus arteriosus</li> <li>◇ Mitral valve prolapse</li> </ul> </li> <li>» Successfully repaired simple lesions (atrial or ventricular septal defect, patent ductus arteriosus, anomalous pulmonary venous drainage).</li> <li>» Atrial or ventricular ectopic beats, isolated</li> </ul>
<b>WHO Risk Class II</b> (If otherwise well and uncomplicated) Small increased risk of maternal mortality or moderate increase in morbidity.	<ul style="list-style-type: none"> <li>» Unoperated atrial or ventricular septal defect</li> <li>» Repaired tetralogy of Fallot</li> <li>» Most arrhythmias</li> </ul>
<b>WHO Risk Class II or III</b> (Depending on individual) Risk as indicated in Class II (above) or Class III (below).	<ul style="list-style-type: none"> <li>» Mild left ventricular impairment</li> <li>» Hypertrophic cardiomyopathy</li> <li>» Native or tissue valvular heart disease not considered WHO I or IV</li> <li>» Marfan syndrome without aortic dilatation</li> <li>» Aorta &lt;45 mm in aortic disease associated with bicuspid aortic valve</li> <li>» Repaired Coarctation</li> </ul>



WHO Pregnancy Risk Classification (Risk of pregnancy by medical condition)	Cardiovascular Conditions by WHO Risk Class
<b>WHO Risk Class III</b> Significantly increased risk of maternal mortality or severe morbidity. Expert counseling required. If pregnancy is decided upon, intensive specialist cardiac and obstetric monitoring needed throughout pregnancy, childbirth and the puerperium.	<ul style="list-style-type: none"> <li>» Mechanical valve</li> <li>» Systemic right ventricle</li> <li>» Fontan circulation</li> <li>» Cyanotic heart disease (unrepaired)</li> <li>» Other complex congenital heart disease</li> <li>» Aortic dilatation 40-45 mm in Marfan Syndrome</li> <li>» Aortic dilatation 45-50 mm in aortic disease associated with bicuspid aortic valve</li> </ul>
<b>WHO Risk Class IV</b> (Pregnancy contraindicated) Extremely high risk of maternal mortality or severe morbidity; pregnancy contraindicated. If pregnancy occurs termination should be discussed. If pregnancy continues, care as for class III.	<ul style="list-style-type: none"> <li>» Pulmonary arterial hypertension of any cause</li> <li>» Severe systemic ventricular dysfunction (LVEF &lt;30%, NYHA III-IV)</li> <li>» Previous peripartum cardiomyopathy with any residual impairment of left ventricular function</li> <li>» Severe symptomatic mitral or aortic stenosis</li> <li>» Marfan syndrome with aorta dilated &gt;45 mm</li> <li>» Aortic dilation &gt;50 mm in aortic disease associated with bicuspid aortic valve</li> <li>» Native severe Coarctation</li> </ul>

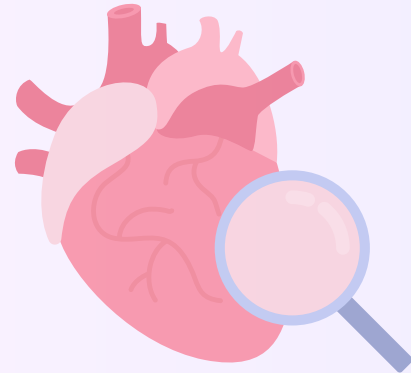
Adapted from WHO, 2017

Table 17: New York Heart Classification

Heart Failure	Symptoms
Class I	No limitation of physical activities. Ordinary physical activities do not cause any symptoms.
Class II	Slight limitation of physical activities. Comfortable at rest. Ordinary physical activities may cause symptoms like fatigue, palpitation, dyspnea.
Class III	Marked limitation of physical activities. Comfortable at rest. Less than ordinary activities may cause symptoms like fatigue, palpitation, dyspnea.
Class IV	Inability to carry out any physical activities without discomfort. Symptoms of heart failure present even at rest.

### 2.8.5 Investigations and referral to cardiac center

1. Full blood count
2. Urine routine and culture
3. ECG → in diagnosis of arrhythmias (and not for structural abnormalities)
4. Other antenatal routine investigations
5. Refer to cardiologist.



### 2.8.6 Management

#### 2.8.6.1 Principles of Antepartum management

- » Care for the pregnancy and delivery should be planned out in the antenatal record of the woman.
- » In women with congenital heart disease, screening fetal echocardiogram is indicated at 18–22 weeks of gestation because of the risk of congenital heart defect in the fetus is estimated at 4–10%.
- » Fetal growth restriction occurs in many types of maternal congenital and acquired cardiac lesions, fetal growth assessment by clinical examination or ultrasonography should be done.
- » Left ventricular hypertrophy with impairment of diastolic function may develop with long-term hypertension. Severe hypertension (i.e. systolic blood pressure more than 160 mm Hg and diastolic blood pressure more than 110 mmHg), should be promptly treated to prevent complications.
- » Pulmonary edema with preeclampsia may be cardiogenic or noncardiogenic in origin or a combination of both. Echocardiography can help differentiate between the two entities.
- » An echocardiogram should be performed in any pregnant or postpartum patient presented with pulmonary edema, which may be due to peripartum cardiomyopathy or preeclampsia.

### 2.8.6.2 Principles of Intrapartum Management

- » An individualized detailed delivery plan should be recorded, through a shared decision making with the cardiac team.
- » Women with stable cardiac disease can undergo a vaginal delivery at 39 weeks of gestation, with cesarean delivery reserved for obstetric indications.
- » Patients with very high-risk cardiac conditions may not be able to tolerate the fluctuations in cardiac output or Valsalva efforts that occur during vaginal delivery. Positioning the patient on the left lateral side helps in reducing any associated haemodynamic fluctuations. Patients should be advised to be in propped up position.
- » Restrict IV fluids at 75 ml/hour
- » Regional anesthesia during labor provides sufficient pain relief.
- » Vaginal delivery is preferred with the use of outlet forceps or vacuum used in second stage of labor.
- » Anticoagulation must be carefully reviewed and managed by the Obstetric and cardiac team during pregnancy and adjusted appropriately at the time of regional anesthesia and delivery. Women on prophylactic low-molecular-weight heparin (LMW), discontinuation is recommended at least 12 hours before scheduled induction of labor or cesarean delivery.
- » The most common intrapartum cardiac complications include pulmonary edema or arrhythmias. Pulmonary edema usually can be prevented by maintaining a meticulous fluid balance.
- » Antibiotic prophylaxis administered at the time of delivery is reasonable for the prophylaxis and to prevent at increased risk of developing infective endocarditis, such as those with a history of previous infective endocarditis, and for patients at high risk of experiencing an adverse outcome from infective endocarditis.
- » Antibiotic prophylaxis against infective endocarditis is not required for childbirth. (NICE, 2008). However, American Heart Association and British Society for Antimicrobial Chemotherapy (2006) suggested that antibiotic prophylaxis may be required during delivery for women at high risk for developing infective endocarditis (e.g., women with prosthetic heart valves or those with previous history of endocarditis).
- » If antibiotics are administered, the subsequent regimen is followed: 1 g amoxicillin (IV) plus 120 mg gentamicin (IV) is administered at the onset of labour or ruptured membranes or prior to caesarean delivery. This is followed by the administration of amoxicillin 500 mg orally (or via IM or IV routes depending on the clinical condition) 6 hours later.
- » For patients allergic to penicillin, 1 g vancomycin (IV) or teicoplanin 400 mg (IV) may be administered.

## Cardiac conditions where vaginal delivery is contraindicated / Cesarean section is done

- » Aortic aneurysm or dilated aortic root  $\geq 4$  cm
- » Marfan's syndrome with aortic involvement
- » Severe symptomatic aortic stenosis
- » Acute severe congestive heart failure
- » Recent Myocardial Infarction (MI)
- » Need for emergency valve replacement immediately after delivery
- » A patient who is fully anticoagulated with warfarin at the time of labor needs to be counseled for cesarean section because the baby is also anticoagulated and vaginal delivery carries increased risk to the fetus of intracranial hemorrhage

### 2.8.6.3 Principles of immediate postpartum management

- » During postpartum period there is increased risk of maternal morbidity and mortality.
- » Among cardiovascular disease-related mortality, peripartum cardiomyopathy (25–100 per 100,000 live births) is identified as the leading (23%) cause of late postpartum death.

#### Peripartum cardiomyopathy:

This condition usually presents late in pregnancy or early in puerperium and can occur up to 6 months after delivery. It should be suspected if the pregnant or puerperal woman complains of increasing shortness of breath on lying flat or at night. (Suspected Pulmonary edema). This risk is higher with common concurrence of immediate postpartum obstetric complications, such as hypertensive disorders, hemorrhage, and infection. Careful and frequent monitoring of the signs and symptoms of cardiovascular disease using pulse oximetry, lung auscultation, recording of fluid balance, and for watch for the development of shortness of breath or cough.

- » Aortic dissection and acute coronary syndromes typically are diagnosed in the early postpartum period and are associated with a high risk of maternal mortality.
- » There is increased risk of Venous Thromboembolism (VTE) with Cesarean delivery complicated by postpartum hemorrhage, infection, or medical disorders, obese women with a BMI of 35 or more. In such cases thromboprophylaxis should be considered. (Dosage - 0.5 mg/ kg enoxaparin every 12 hours).

#### Management of the third stage of labour

During the third stage of labour in women with heart disease, bolus doses of oxytocin can cause severe hypotension and should therefore be avoided. Low-dose oxytocin infusions are safer and may be equally effective.



*Note: Ergometrine is avoided as it can cause acute hypertension  
Misoprostol may be safe but it can cause problem such as hyperthermia*

### Maternal Complications:

- » Pulmonary oedema and arrhythmias
- » Increased maternal morbidity
- » An increased risk for cardiac complications, such as heart failure, arrhythmias, and stroke.

### Fetal Complications:

- Intrauterine growth restriction (IUGR) (mild in cases of patients with rheumatic heart valve disease and severe in cases of lesions associated with cyanosis in the mothers).
- » Neonatal asphyxia
  - » Respiratory distress
  - » Fetal or neonatal death.

Table 18: Obstetric medications with cardiac influence

Drug	Cardiovascular Side Effects	Cardiac Conditions Contraindicated	Special Considerations
Corticosteroids (Betamethasone or Dexamethasone)	Fluid retention Electrolyte disturbance Hypertension	Use with caution in patients with heart failure or hypertension	Recent history of myocardial infarction; risk of left ventricular free wall rupture
Hydroxyprogesterone	Fluid retention Electrolyte disturbance Hypertension	Use with caution in patients with cardiac dysfunction	
Prostaglandin (PGE2)	None reported		
Misoprostol	Rare		Use with caution
Oxytocin	Arrhythmias Hypotension		Titrate carefully and avoid rapid intravenous bolus
Magnesium Sulfate	Hypotension Vasodilation Syncope	Caution in patients with heart block	Titrate carefully in hypertrophic obstructive cardiomyopathy and stenotic valvular lesions especially aortic stenosis
Terbutaline	Tachycardia Hypotension Arrhythmias Myocardial ischemia	Hypertrophic obstructive cardiomyopathy Patients at risk of arrhythmias or ischemia Stenotic valvular lesions especially mitral stenosis	Do not use beyond 48–72 hours
Methylergometrine	Coronary artery vasospasm Hypertension Arrhythmias	Coronary artery disease or risk for ischemia  Aortopathies	Do not give intravenously
Carboprost	Hypertension	Pulmonary hypertension	Can cause bronchospasm
Tranexamic Acid			Use with caution in uncorrected cardiovascular disease due to thrombosis

### 2.8.7 Breastfeeding

Breastfeeding should be encouraged in cardiac patients because most medications are considered safe.

Breastfeeding improve mother- infant bonding.

Women whose cumulative lifetime duration of breastfeeding is 6–12 months are 10% less likely to develop cardiovascular disease. (ACOG Pregnancy and Heart Disease, 2019)



### 2.8.8 Contraceptive options

- » Immediate postpartum placement of long-acting reversible contraceptive.
- » Intrauterine devices (copper and progestin containing) are a recommended option for women with high-risk cardiovascular conditions (refer to World Health Organization four-tier scale related to medical eligibility criteria for contraceptive use.)
- » Progestin-only contraceptives (oral, depot medroxy- progesterone acetate injection, or implant) are potentially effective alternatives for women with cardiac disease. The progestin-only pill is limited for use in the immediate postpartum period in lactating women.



### 2.8.9 Standard cardiac care during labour and delivery:

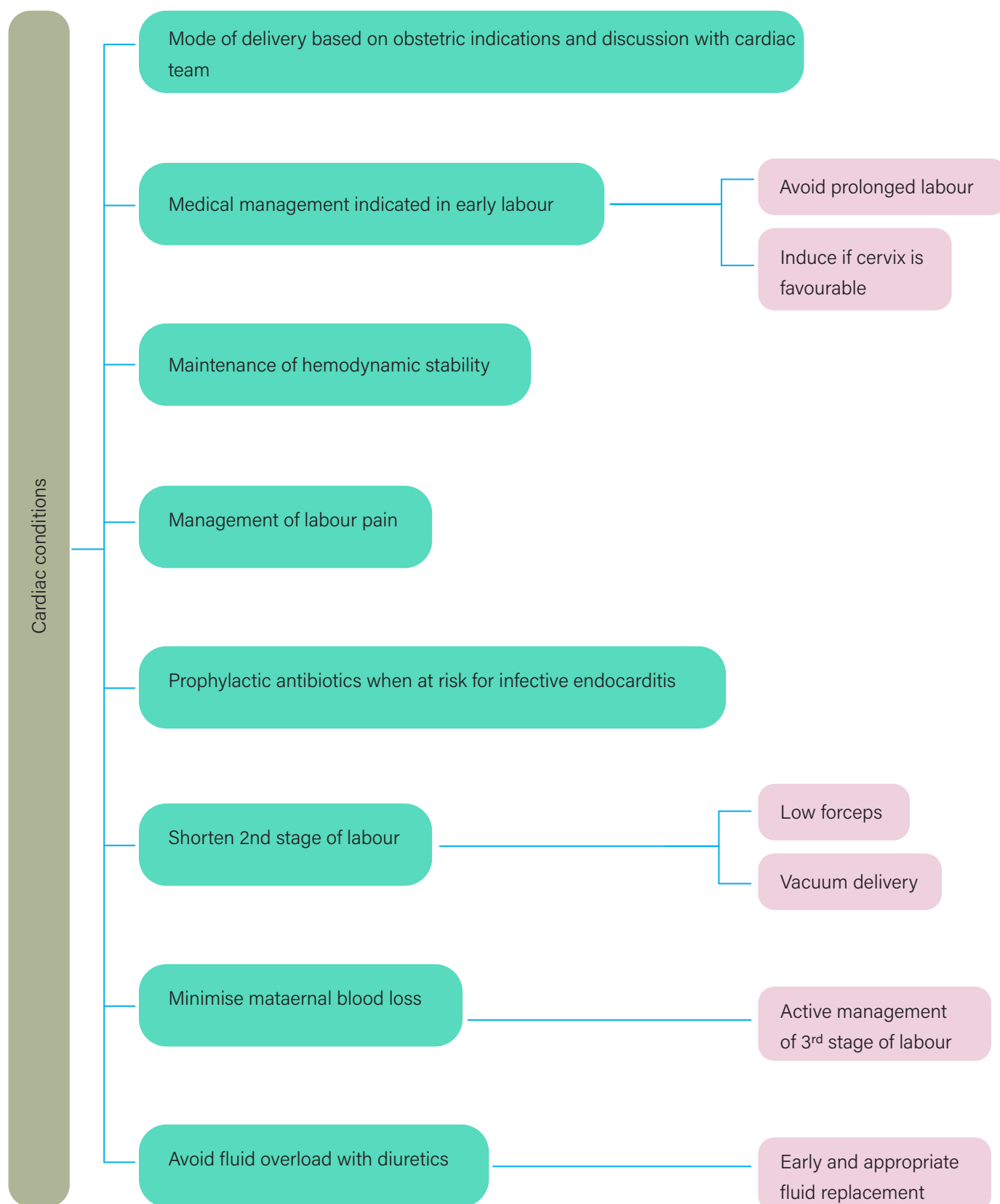


Figure 10: Standard cardiac care during labour and delivery

# CHAPTER 3

## COMPLICATIONS IN PREGNANCY

Topics in this chapter

- » Bleeding in early pregnancy
- » APH





## 3.1 BLEEDING IN EARLY PREGNANCY

Vaginal bleeding is a common complication in early pregnancy and is associated with miscarriage, ectopic pregnancy and gestational trophoblastic disease.

### 3.1.1 Miscarriage

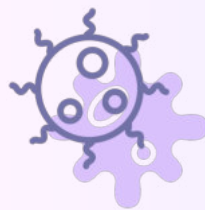
- » Loss of a pregnancy before 28 completed weeks of gestation
- » Expulsion of fetus or embryo weighing less than 500g
- » 10-15% of clinically recognizable pregnancies end in a miscarriage



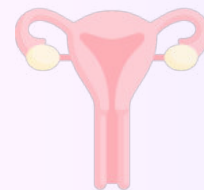
### 3.1.2 Causes



Genetic



Infection



Uterine anomalies



Cervical incompetence



Unexplained

### 3.1.3 Types of Miscarriage

Table 19: Types of miscarriages

Diagnosis	Symptoms	Sign
<b>Threatened miscarriage</b>	<ul style="list-style-type: none"> <li>» Abdominal pain/cramps</li> <li>» Light bleeding</li> </ul>	<ul style="list-style-type: none"> <li>» Closed cervix</li> <li>» Uterus softer than normal and corresponds to dates</li> </ul>
<b>Inevitable miscarriage</b> (Pregnancy will not continue and will proceed to incomplete/complete miscarriage)	<ul style="list-style-type: none"> <li>» Abdominal pain/cramps</li> <li>» Heavy vaginal bleeding</li> <li>» No expulsion of products of conception</li> </ul>	<ul style="list-style-type: none"> <li>» Dilated cervix</li> <li>» Uterus corresponds to dates</li> <li>» Uterus tender</li> </ul>
<b>Incomplete miscarriage</b> (Products of conception are partially expelled)	<ul style="list-style-type: none"> <li>» Cramping/lower abdominal pain</li> <li>» Heavy vaginal bleeding</li> <li>» Partial expulsion of products of conception</li> </ul>	<ul style="list-style-type: none"> <li>» Dilated cervix</li> <li>» Uterus smaller than dates</li> </ul>
<b>Complete miscarriage</b> (Products of conception are completely expelled)	<ul style="list-style-type: none"> <li>» Abdominal pain/cramps</li> <li>» Vaginal bleeding</li> <li>» History of expulsion of products of conception</li> </ul>	<ul style="list-style-type: none"> <li>» Closed cervix</li> <li>» Uterus smaller than dates</li> <li>» Uterus softer than normal</li> </ul>
<b>Missed miscarriage</b> (Products of conception not expelled but fetal cardiac activity is absent).	<ul style="list-style-type: none"> <li>» Bleeding may or may not be present</li> </ul>	<ul style="list-style-type: none"> <li>» Closed cervix</li> <li>» Uterus smaller than dates</li> </ul>

### 3.1.4 Expected Management

The approach of 'wait and see' to allow spontaneous expulsion of Product Of Conception (POC) without any immediate intervention

- » Only suitable for patients who are stable and has easy access to medical facility
- » Inform patient with possible complications (failure of expulsion, infection or excessive bleeding)
- » If no expulsion after two weeks do full blood count, clotting profile and repeat USG.
- » Offer surgical intervention if no expulsion by surgical intervention

### 3.1.5 Medical Management

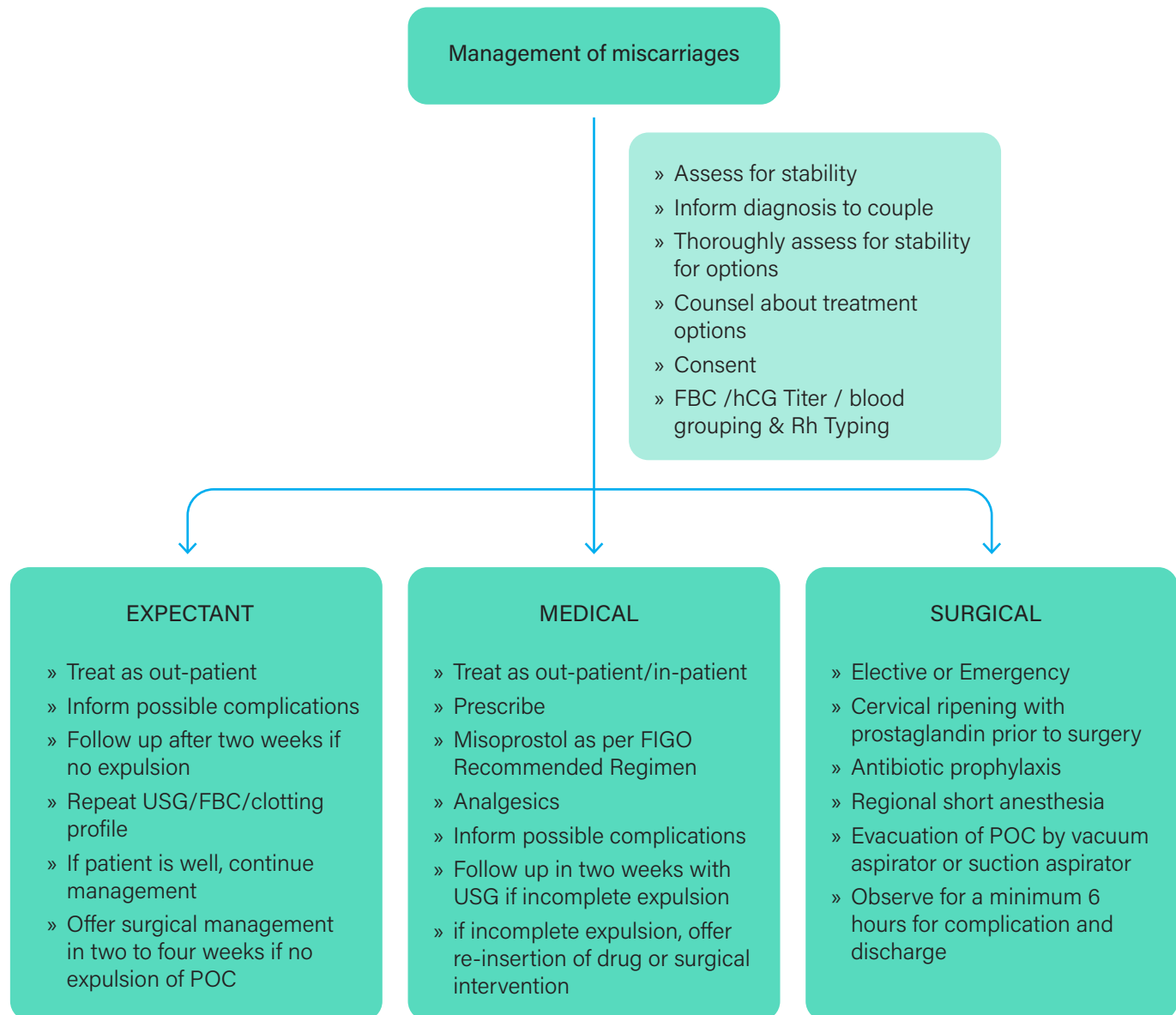


Figure 11: Medical management of miss carriage

Table 20: Recommended dose and administration of Misoprostol. Adapted from FIGO.

MISOPROSTOL-ONLY			
RECOMMENDED REGIMENS 2017			
<13 weeks gestation	13-26 weeks gestation	>26 weeks gestation	Postpartum use
<b>Pregnancy termination</b> 800µg SL every 3 hours	<b>Pregnancy termination</b> 13-24 weeks: 400µg PV/SL/bucc* every 3 hours	<b>Pregnancy termination</b> 27-28 weeks: 200µg PV/SL/bucc* every 4 hours >28 weeks: 100µg PV/SL/bucc* every 6 hours	<b>Postpartum Haemorrhage (PPH)</b> <b>Prophylaxis</b> Or PPH secondary prevention (approx. ≥300ml blood loss) 800µg SL (X1)
<b>Missed abortion</b> 800µg PV* every 3 hours (X2) Or 600µg SL every 3 hours (X2)	<b>Fetal death</b> 200µg PV*/SL/bucc every 4-6 hours	<b>Fetal death</b> 27-28 weeks: 100µg PV*/SL/bucc every 4hours >28 weeks: 25µg PV* every 6 hoursn Or 25µg PO every 2 hours	<b>PPH treatment</b> 800µg SL (X1)
<b>Incomplete abortion</b> 600µg PO (X1) Or 400µg SLI (X1) Or 400-800µg PV* (X1)	<b>Inevitable abortion</b> 200µg PV*/SL/bucc every 6 hours	<b>Induction of labour</b> 25µg PV* every 6 hours Or 25µg PO every 2 hours	
<b>Cervical preparation for surgical abortion</b> 400µg SL 1 hour before procedure Or PV* 3 hours before procedure	<b>Cervical preparation for surgical abortion</b> 13-19 weeks: 400µg PV 3-4 hours before procedure >19 weeks: needs to be combined with other modalities		

**Route of administration**

PV- vaginal administration

SL- Sublingual administration

PO- Oral

Bucc- Buccal (in the cheek)

\*Avoid PV (vaginal route) if bleeding and/or signs of infection

Rectal route is not included as recommended route because the pharmacokinetic profile is not associated with best efficacy.

**Notes:**

1. If mifepristone is available (preferable), follow the regimen prescribed for mifepristone + misoprostol.
2. Included in the WHO model list of essential medicines
3. For incomplete/inevitable abortion women should be treated based on their uterine size rather than menstrual period (LMP) dating
4. Leave to take effect over 1-2 weeks unless excessive bleeding or infection
5. An additional dose can be offered if the placenta has not been expelled 30 minutes after fetal expulsion
6. Several studies limited dosing to 5 times, most women have complete expulsion before use of 5 doses, but other studies continued beyond 5 and achieved a higher total success rate with no safety issues
7. Including ruptured membranes where delivery indicated
8. Follow local protocols if previous cesarean or intrauterine scar
9. If only 200mg tablets are available, smaller doses can be made by dissolving in water (see [www.misoprostol.org](http://www.misoprostol.org))
10. Where oxytocin is not available or storage conditions are inadequate

### 3.1.6 Follow-up after miscarriage

- » Anti D immunoglobulin (Rh immunoprophylaxis) to Rh negative mothers, 50µgm IM if less than 12 weeks of gestation or 300 µgm IM if gestation is more than 12 weeks.
- » Advise the woman to watch for symptoms and signs requiring immediate attention:
  - ◇ Prolonged cramping (more than a few days)
  - ◇ Prolonged bleeding (more than 2 weeks)
  - ◇ Bleeding more than normal menstrual bleeding
  - ◇ Severe or increased abdominal pain
  - ◇ Fever, chills or malaise
  - ◇ Syncope
- » In complicated cases:
  - ◇ Continue monitoring vital signs and vaginal bleeding, abdominal pain and urine output every 6 hours for 24 hours.
  - ◇ Check haemoglobin levels after 24 hours. If the woman's condition is stable and Hb>8 g/dl, she can be discharged.
- » Follow up after 2 weeks - All women experiencing a miscarriage should be offered emotional support, post-abortion contraceptive counselling and plan for future pregnancies

## 3.2 ECTOPIC PREGNANCY

An ectopic pregnancy is one in which implantation occurs outside the uterine cavity. The fallopian tube is the most common site of ectopic implantation (greater than 90%).

### 3.2.1 Signs and Symptoms of unruptured and ruptured ectopic pregnancy

#### Unruptured Ectopic Pregnancy

- » Symptoms of early pregnancy (irregular spotting or bleeding, nausea, breast heaviness, bluish discoloration of vagina and cervix, softening of cervix, slight uterine enlargement, increased urinary frequency)
- » Abdominal and pelvic pain

#### Ruptured Ectopic Pregnancy

- » Pallor
- » Fast, weak pulse (110 per minute or more)
- » Acute abdominal and pelvic pain
- » Abdominal distension
- » Rebound tenderness
- » Hypotension
- » Hypovolaemia
- » Syncope/Shock

### 3.2.2 Risk factors

- » Pelvic Inflammatory Disease (PID)
- » Intra Uterine Contraceptive Device (IUCD) in situ
- » In vitro Fertilization (IVF)
- » Previous abdominal and surgery (including sterilization)
- » Previous H/O ectopic pregnancy
- » Progestin contraception

### 3.2.3 Differential Diagnosis

- » Threatened abortion (most common)
- » Acute or chronic PID
- » Ovarian cysts (torsion or rupture)
- » Acute appendicitis

### 3.2.4 Diagnosis and Management of ectopic pregnancy

#### 1. Serum beta HCG levels

Normal pregnancy – hCG levels near doubles every 48-72 hours until it reaches 10000-20000miu/ml  
No single serum beta hCG level is diagnostic of ectopic pregnancy

#### 2. Ultrasonography

TVS is the diagnostic tool of choice

Ectopic pregnancy is suspected if transabdominal USG does not show an intrauterine gestational sac and the patient's beta-hCG level is greater than 6,500 mIU per mL (6,500 IU per L) or if transvaginal USG does not show an intrauterine gestational sac and the patient's beta-hCG level is 1,500 mIU per mL (1,500 mIU per L) or greater.

#### 3. Serum progesterone

In normal pregnancy is >25ng.ml

#### 4. Diagnostic laparoscopy

### 3.2.5 management of ectopic pregnancy

#### In hemodynamically unstable patient

Immediate resuscitation and emergency laparoscopy/laparotomy and salpingectomy

#### In hemodynamically stable patient

##### 1. Expectant management .

A good candidate has:

- ◇ Beta-hCG level less than 1,000 mIU per mL (1,000 IU per L) and declining,
- ◇ An ectopic mass less than 3 cm,
- ◇ No fetal heartbeat,
- ◇ Agrees to comply with follow-up requirements

##### 2. Medical management

Methotrexate single or multidose regimen for hemodynamically stable patient with no contraindications.  
Obstetricians may follow the algorithm in figure 12 when managing a patient with ectopic pregnancy.



## Algorithm for Management of ectopic pregnancy

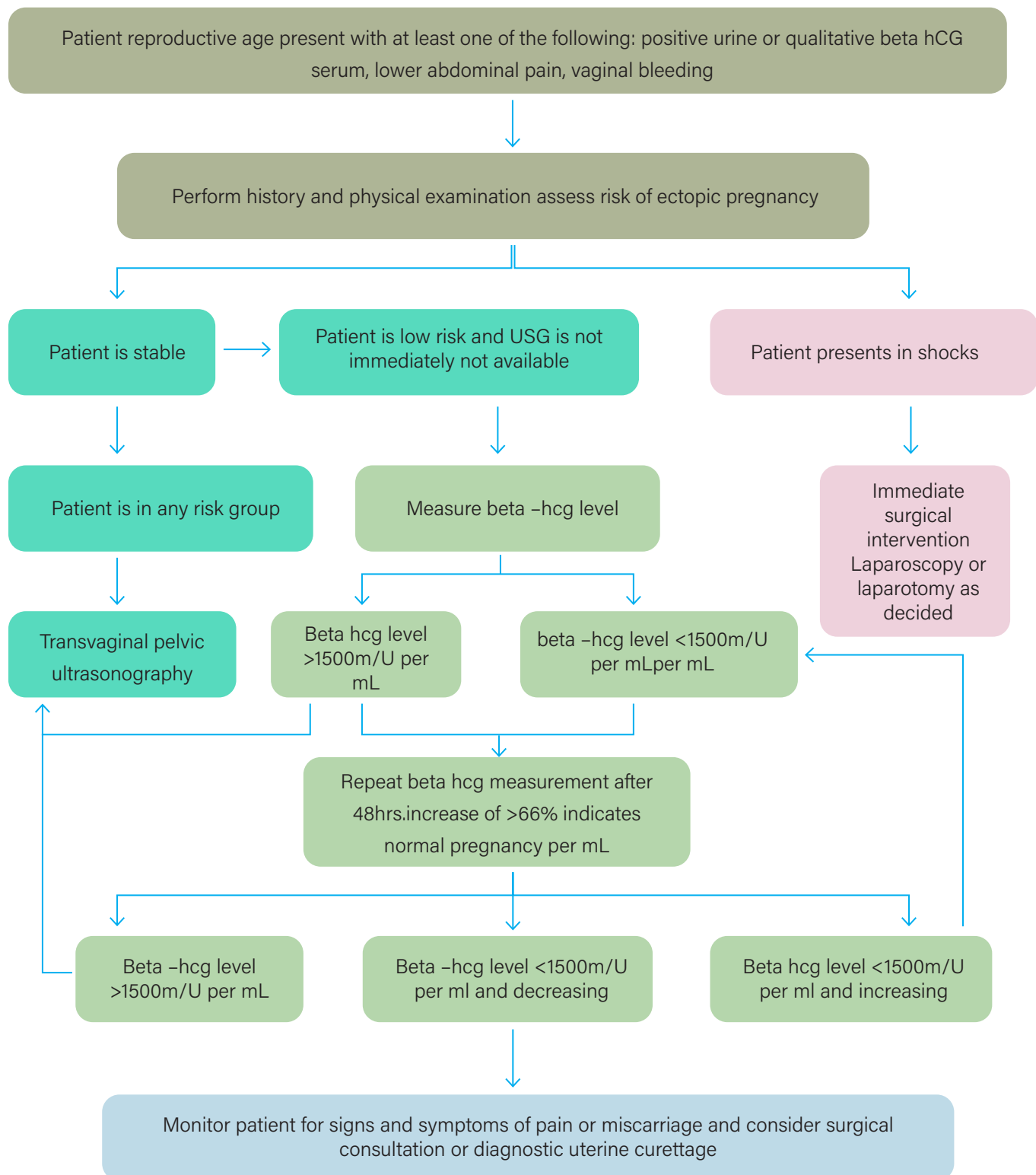
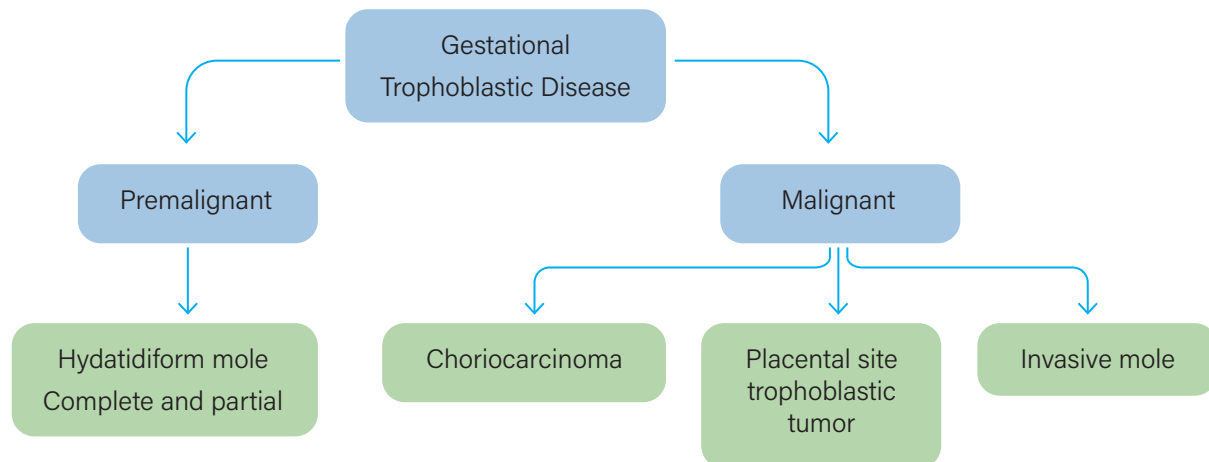


Figure 12: Algorithm for management of ectopic pregnancy

### 3.3 GESTATIONAL TROPHOBLASTIC DISEASE

Spectrum of proliferative abnormalities of trophoblasts associated with pregnancy  
Gestational trophoblastic disease should be managed at a referral facility.

#### 3.3.1 WHO Classification of trophoblastic disease



Figurer 13: WHO classification of Gestational Trophoblastic Disease

#### 3.3.2 Risk factors

- » Extremes of age
- » Previous GTD
- » Nutrition – Studies have linked low levels of carotene and Vitamin A in a person's diet with molar pregnancy.
- » Blood group A & AB may have a slightly increased risk
- » Family history

#### Clinical presentation

- » Vaginal bleeding, during or after pregnancy, history pf passage of grape like vesicles
- » Hyperemesis gravidarum
- » Uterus larger than dates
- » Feature of early onset preeclampsia
- » Features of hyperthyroidism
- » Lower abdominal pain
- » Uterus larger than dates in >50% of cases
- » Anemia & Weight loss

### 3.3.3 Investigations

- » Serum Beta hCG titres
- » USG
  - ◇ Image in first trimester may resemble missed or incomplete miscarriage. Hence diagnosis needs to be confirmed with HPE
  - ◇ Typical snowstorm appearance seen in second trimester as heterogenous mass with no fetal development (fetal parts seen in partial mole)
  - ◇ Theca lutein ovarian cyst to be excluded
- » Full blood count
- » FCB
- » CXR if indicated

### 3.3.4 Management

- » Suction evacuation is the best means of evacuation of uterus
- » Cervical ripening is not recommended
- » POC should be sent for HPE
- » Routine second evacuation of the uterus is not recommended
- » USG pelvis can be done to confirm complete evacuation before discharge for follow up
- » Injection Anti-D if Rh negative

### 3.3.5 Follow up

- » Follow up after GTD is individualized according to the type of GTD
- » Serial estimation of serum beta hCG titre levels (eg: to be done 24 to 48 hours after evacuation, weekly for 4 weeks, then fortnightly for 3 months and then 3-6 monthly for 2yrs)
- » Avoid pregnancy for up to 6 months after hCG levels have normalized
- » Combined Oral Contraceptive Pills (COCP) is acceptable for contraception after hCG levels have normalized

### 3.4 ANTEPARTUM HAEMORRHAGE (APH)

Bleeding from or in to the genital tract, occurring from 24+0 weeks of pregnancy and prior to the birth of the baby

#### 3.4.1 Causes

- » Abruptio Placentae
- » Placenta Praevia
- » Vasa Previa
- » Uterine rupture
- » Bleeding due to other causes
  - ◇ Cervical erosion
  - ◇ Cervical polyp
  - ◇ Cervicitis
  - ◇ Carcinoma
  - ◇ Genital tract trauma
- » Undetermined

For the purposes of this guideline, the following definitions have been used:

*Spotting* – staining, streaking or blood spotting noted on underwear or sanitary protection

*Minor haemorrhage* – blood loss less than 50 ml that has settled

*Major haemorrhage* – blood loss of 50–1000 ml, with no signs of clinical shock

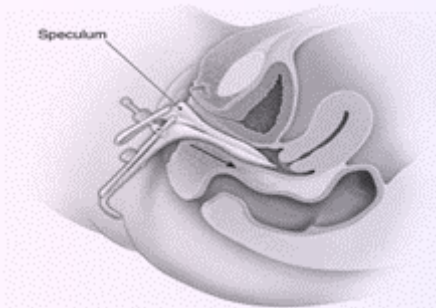
*Massive haemorrhage* – blood loss greater than 1000 ml and/or signs of clinical shock.

Recurrent APH is the term used when there are episodes of APH on more than one occasion.

#### 3.4.2 Examination

##### Speculum examination

A careful speculum examination can be considered to identify dilation or visualize a lower genital tract for cause for the APH



##### Digital vaginal examination

If placenta praevia is a possible diagnosis (for example, a previous scan shows a low placenta, there is a high presenting part on abdominal examination or the bleed has been painless), digital vaginal examination **SHOULD NOT BE** performed until an ultrasound has excluded placenta praevia.

### 3.4.3 Differential diagnosis

Table 21: Differential diagnosis of APH

Diagnosis	Findings	Remarks
Abruptio placentae	<ul style="list-style-type: none"> <li>» Painful, tender uterus, often tense with contractions</li> <li>» Woody hard.</li> <li>» Bright, dark or clotted blood</li> <li>» Maternal hypotension</li> <li>» Signs of fetal distress (CTG abnormalities, decelerations, sinusoidal pattern)</li> </ul>	General condition and anemia may not be proportionate to blood loss (concealed abruption)
Placenta previa	<ul style="list-style-type: none"> <li>» Sudden onset, painless, causeless bleeding</li> <li>» Soft, non-tender uterus</li> <li>» Floating fetal head in contrast to gestational age</li> <li>» 10% do not have bleeding till term</li> </ul>	<p>Commonly diagnosed with routine USG</p> <p>General condition and anemia are proportionate to blood loss</p>
Vasa previa	<ul style="list-style-type: none"> <li>» Painless vaginal bleeding with fetal heart abnormalities</li> <li>» Suspected based on USG findings</li> </ul>	Should be considered if bleeding occurs after spontaneous or iatrogenic rupture of the fetal membranes.
Uterine rupture	<ul style="list-style-type: none"> <li>» Severe abdominal pain, tenderness, cessation of contractions with loss of uterine tone</li> <li>» Fetal bradycardia</li> <li>» IUD</li> </ul>	A high clinical suspicion is needed especially in those with history of prior uterine surgery

## Algorithm for management of major APH

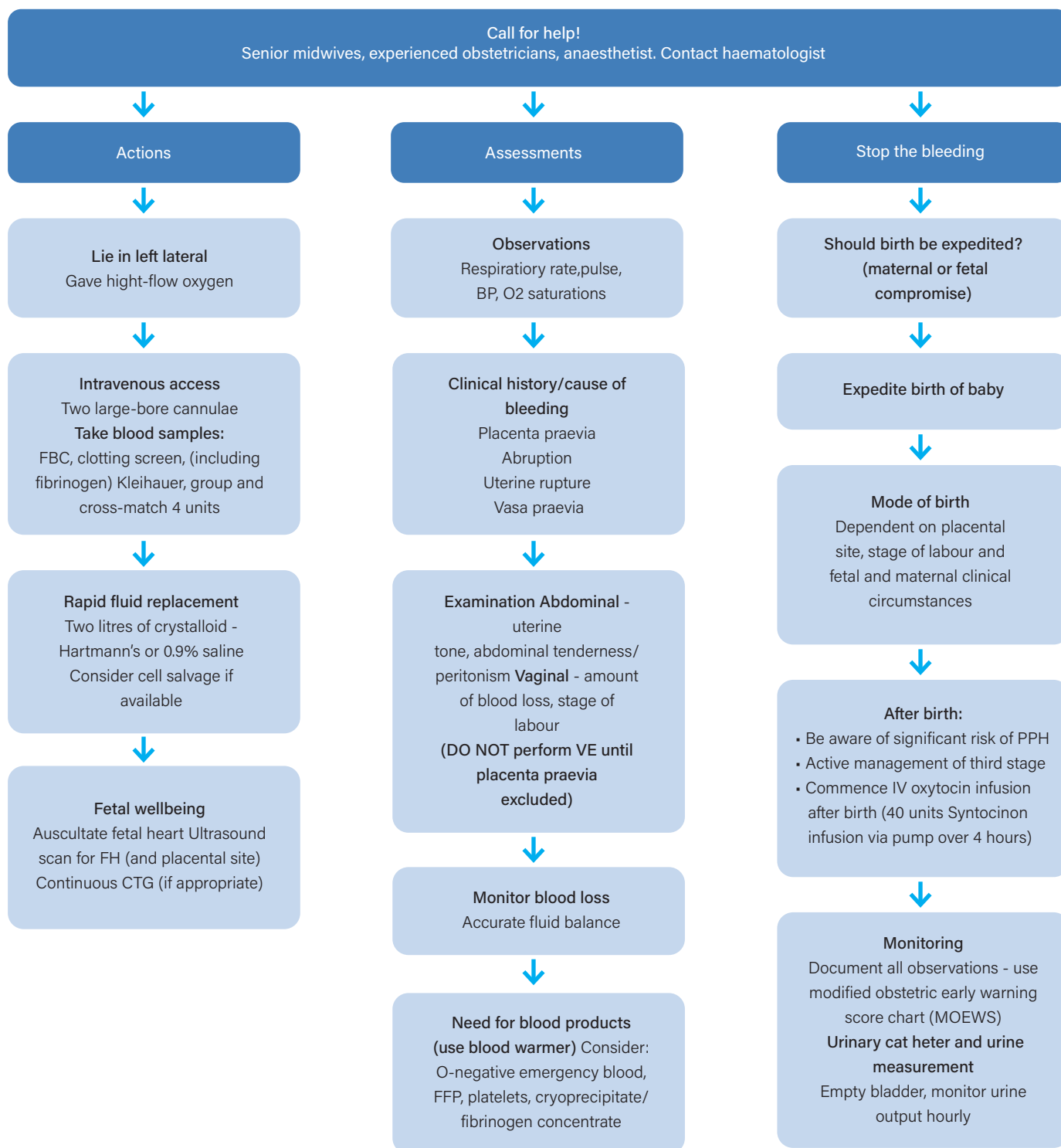
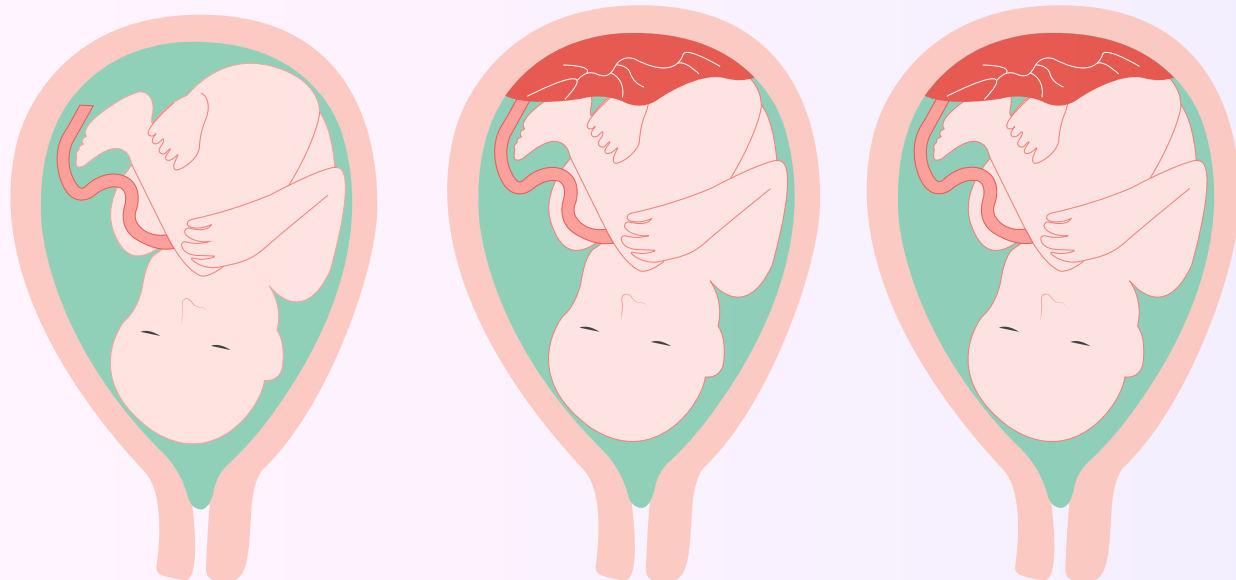


Figure 14: Adapted from PROMPT Course Manual: Australian-New Zealand Edition, 2020 & South Australian perinatal practice guidelines

### 3.4.4 Complications of APH

Maternal complications	Fetal complications
Anaemia	Fetal hypoxia
Infection	Small for gestational age and fetal growth restrictions
Maternal shock	Prematurity (iatrogenic and spontaneous)
Renal tubular necrosis	Fetal death
Consumptive coagulopathy	
Postpartum haemorrhage	
Prolonged hospital stay	
Psychological sequelae	
Complications of blood transfusion	



## 3.5 ABRUPTIO PLACENTA

Premature separation of a normally sited placenta from the uterus.

### 3.5.1 Risk factors

- » Idiopathic
- » Women who have had previous pregnancies complicated by abruption.
- » Pre-eclampsia
- » Fetal growth restriction
- » Mal presentations
- » Polyhydramnios
- » Advanced maternal age
- » Multiparity
- » Low body mass index (BMI)
- » Pregnancy following assisted reproductive techniques
- » Intrauterine infection
- » Premature rupture of membranes
- » Abdominal trauma
- » Smoking and drug misuse during pregnancy

### 3.5.2 classification of abruptio placenta

#### 3.5.2.1 Clinical classification by presence or absence of vaginal bleeding

- » **Revealed abruption**
  - ◇ Active vaginal bleeding
  - ◇ Blood passed through cervix and vagina
- » **Concealed abruption**
  - ◇ No vaginal bleeding
  - ◇ Bleeding accumulates behind placenta with no external bleeding



### 3.5.2.2 Classification by severity of abruption

#### » Grade 0 abruption

- ◊ Asymptomatic
- ◊ Small retroplacental clot detected

#### » Grade 2 abruption

- ◊ Vaginal bleeding
- ◊ Uterine contractions
- ◊ No signs of maternal shock but signs of fetal distress present

#### » Grade 3 abruption

- ◊ Hypertonic uterus and/or "wooden hard" uterus
- ◊ Severe bleeding (revealed or concealed)
- ◊ Persistent abdominal pain
- ◊ Signs of maternal shock (often with coagulopathy) and fetal distress or death

### 3.5.2.3 Classification by site of bleeding

- » *Subchorionic abruption* – bleeding between myometrium and placental membranes
- » *Retroplacental abruption* – bleeding between myometrium and placenta
- » *Placental abruption* – bleeding between placenta and amniotic fluid
- » *Intraplacental abruption*

### 3.5.3 Management of abruptio placenta

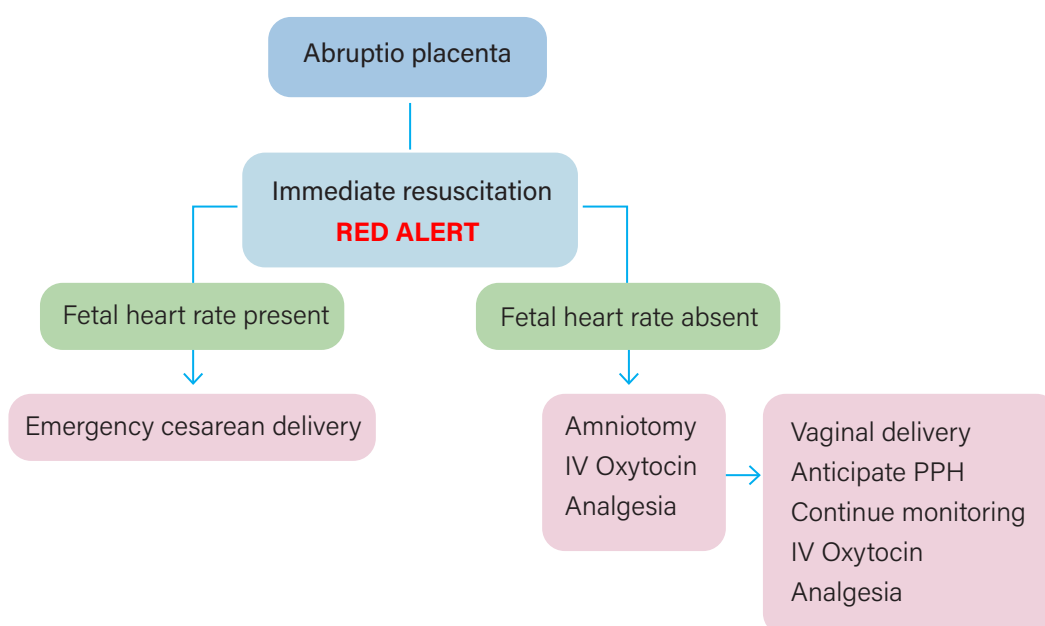


Figure 15: Management of Abruptio placenta

## 3.6 PLACENTA PREVIA

placenta previa occurs when the placenta is partially or wholly inserted into the lower uterine segment.

### 3.6.1 Classification

- » *Minor placenta previa*: placenta is sited in the lower segment but does not cover the cervical Os
- » *Major placenta previa*: the placenta covers the cervical Os

### 3.6.2 Risk factors for placenta praevia

- » Previous placenta praevia
- » Previous caesarean sections
- » Multiparity
- » Advanced maternal age (>40 years)
- » Multiple pregnancy
- » Smoking
- » Deficient endometrium due to presence or history of:
  - ◇ Uterine scar
  - ◇ Endometritis
  - ◇ Manual removal of placenta
  - ◇ Curettage
  - ◇ Submucous fibroid
- » Assisted conception

Women be advised to report all vaginal bleeding to their antenatal care provider

### 3.6.3 Management of placenta previa

All women with APH heavier than spotting and women with ongoing bleeding should remain in hospital and should be closely monitored, at least until the bleeding has stopped.

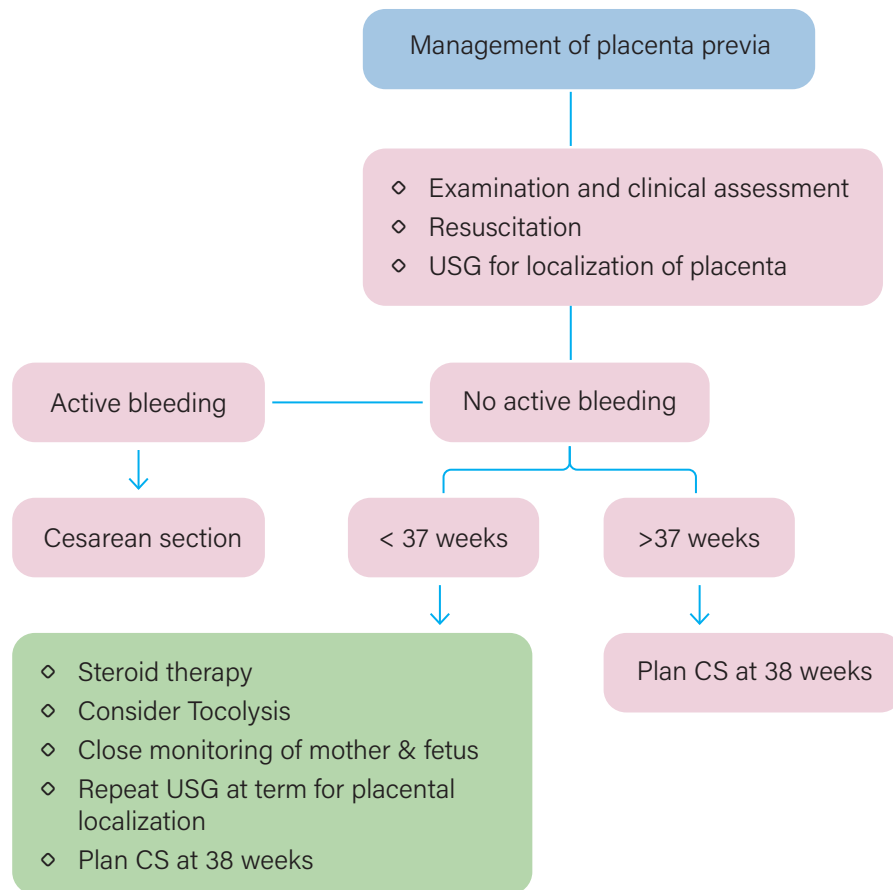


Figure 16: Management of placenta previae



**Note:** Postpartum haemorrhage (PPH) should be anticipated in women who have experienced APH

Anti-D Ig should be given to all non-sensitised RhD-negative women after any presentation with APH, independent of whether routine antenatal prophylactic anti-D has been administered.

## CHAPTER 4

# DECREASED FETAL MOVEMENTS (DFM)

Topics in this chapter

- » Decreased Fetal Movements (DFM)
- » Intra Uterine Fetal death (IUFD)



## 4.1 DECREASED FETAL MOVEMENTS (DFM)

Maternal perception of fetal movements is a valuable tool for assessment of fetal well-being. Mothers should be advised to be aware of their baby's individual pattern of movements and to contact their health facility/obstetrician if they sense a change in fetal movements pattern.

If they are concerned about a reduction in or cessation of fetal movements after 28+0 weeks of gestation, advise mothers to lie on left lateral position and focus on fetal movements for 1 hour. If they do not feel 5 or more discrete movements in 1 hour, they should contact nearest health facility. (See appendix 5 For kick count chart)

### 4.1.1 Causes of decreased fetal movements/fetal death

#### MATERNAL

Hypertensive disorders, diabetes, fever, antepartum haemorrhage, severe anaemia, maternal syphilis, hepatitis and other infections. Certain drugs such as Benzodiazepines, methadone, alcohol and other opioids can have an effect on fetal movements.

#### FETAL

Intra uterine growth retardation, fetal abnormalities, foetal infection such as rubella, Rh incompatibility, post-term pregnancy

#### Idiopathic

### 4.1.2 Management of DFM

While taking history, the following information should be gathered.

- ◇ Onset and duration of DFM
- ◇ Can DFM be attributed because of busy schedule
- ◇ Any history of previous episodes
- ◇ Intra Uterine Growth Restrictions (IUGR), placental insufficiency, or congenital malformations
- ◇ Comprehensive evaluation of Maternal factors such as PIH, diabetes, smoking, ageing, primiparity and obesity
- ◇ Previous history of IUFD

The initial goal in the event of decreased fetal movement is to exclude fetal death. Additionally, fetal compromise and pregnancies at risk should be identified. Simultaneously, avoid unnecessary interventions. Figure 17 provides a flow chart of management of DFM

## Flowchart for management of DFM

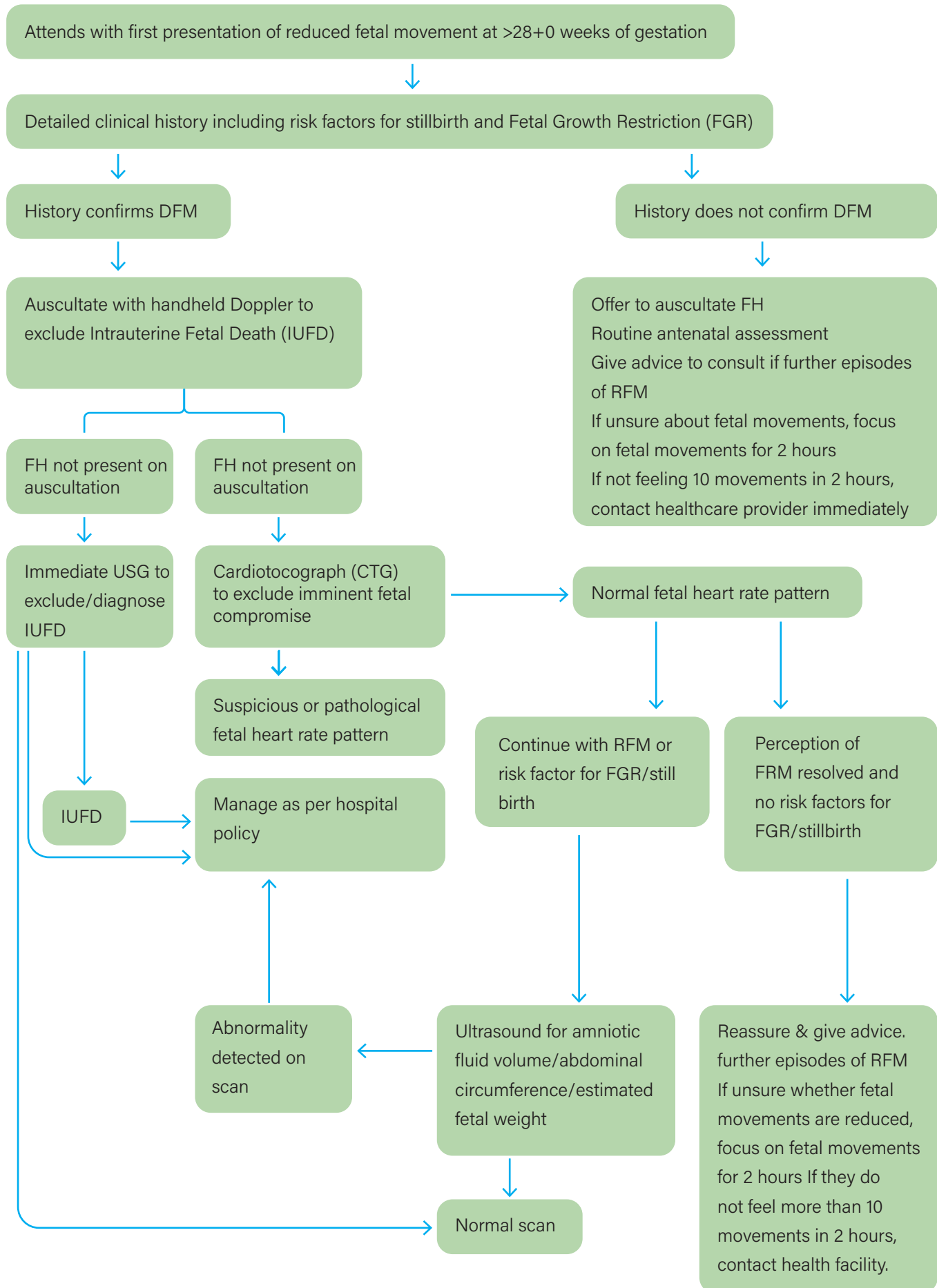


Figure 17: Flow chart for management of DFM. Adapted from Green Top Guideline No. 57 February 2011

## 4.2 INTRAUTERINE FETAL DEATH (IUFD)

Death of a baby before birth can cause considerable upset and grief to parents and their families. It can be a distressing time for health care professionals. A baby who dies after 28 weeks of pregnancy but before or during birth is classified as a still birth.

### 4.2.1 Clinical evaluation

#### History

- » No fetal movements
- » Term or preterm labour
- » Symptoms associated with the cause (e.g. Vaginal bleeding and abdominal pain with abruption, itching with obstetrics cholestasis)

#### Examination

- » No FHS
- » Loss of fetal heart during labour with intrapartum deaths
- » Findings associated with cause (e.g., Woody hard, tender uterus with abruption, hypertension with pre-eclampsia)

#### Risk factors and causes of intrauterine death

##### Maternal

- » Extremes of maternal age
- » Obesity
- » Smoking and substance miss use
- » Hypertensive disorders in pregnancy
- » Diabetes
- » Obstetric cholestasis
- » Medical disorders

##### Fetal

- » Low birth weight
- » Prematurity
- » Congenital anomalies
- » Post maturity
- » Fetal hypoxia
- » Fetal growth restriction
- » Infection
- » Multiple pregnancy

##### Placental

- » Placental abruption
- » Placenta previa
- » Cord prolapse
- » Entanglement

## 4.2.2 Investigations

- » USG – Absence of fetal cardiac activity, Spalding sign of overlapping of skull bones in the dead fetus
- » FBC, Clotting profile, fibrin, fibrinogen and fibrin degradation products levels (if available)
- » Blood Group and typing
- » If there is an obvious cause for the IUFD such as cord prolapse further investigations may still be of value
- » Follow table 21 for investigations in IUFD

Table 22: Investigations into IUFD

Condition	Investigation
<b>Examination</b>	
Pre-eclampsia	BP, PIH investigation
Diabetes	HbA1c, Blood sugars,
Obstetric cholestasis,	LFT and bile acids
Infection	FBC, TORCH, blood & urine culture
If indicated thrombophilia screening and tests for thyrotoxicosis	
<b>Fetal</b>	
Post mortem x-ray, USG and MRI can be considered after discussion with family	
<b>Placental</b>	
Infection	Swabs from placenta
Pathology	Histopathological examination
Karyotyping can be considered after discussion with family	



### 4.2.3 Management

- » Ensure privacy
- » Involve both parents where appropriate
- » Use empathetic but unambiguous language
- » Respect religious/cultural beliefs
- » Provide written information
- » Allow time for questions
- » Allow time for decision making
- » Use active listening
- » Check parents understanding
- » Repeat information
- » Promote continuity of care and career
- » Involve experienced staff
- » Inform relevant care providers
- » Coordinate referrals
- » Complete documentation
- » Discuss timing and options for birth with parents– provide written consent
- » Vaginal birth is generally preferable (in some women CS may be indicated eg: multiple previous CS)
- » Consider method of induction relevant to gestation and clinical circumstances (especially obstetric surgical history)
- » Ensure adequate analgesia
- » Consider active management of third stage of labour

### 4.2.4 Postnatal care

- » Provide advice on lactation suppression
- » Discuss contraception
- » Arrange follow-up
- » Neonatal death reporting form to be filled within 24 hours and submitted to ministry of health (form in Appendix 6).

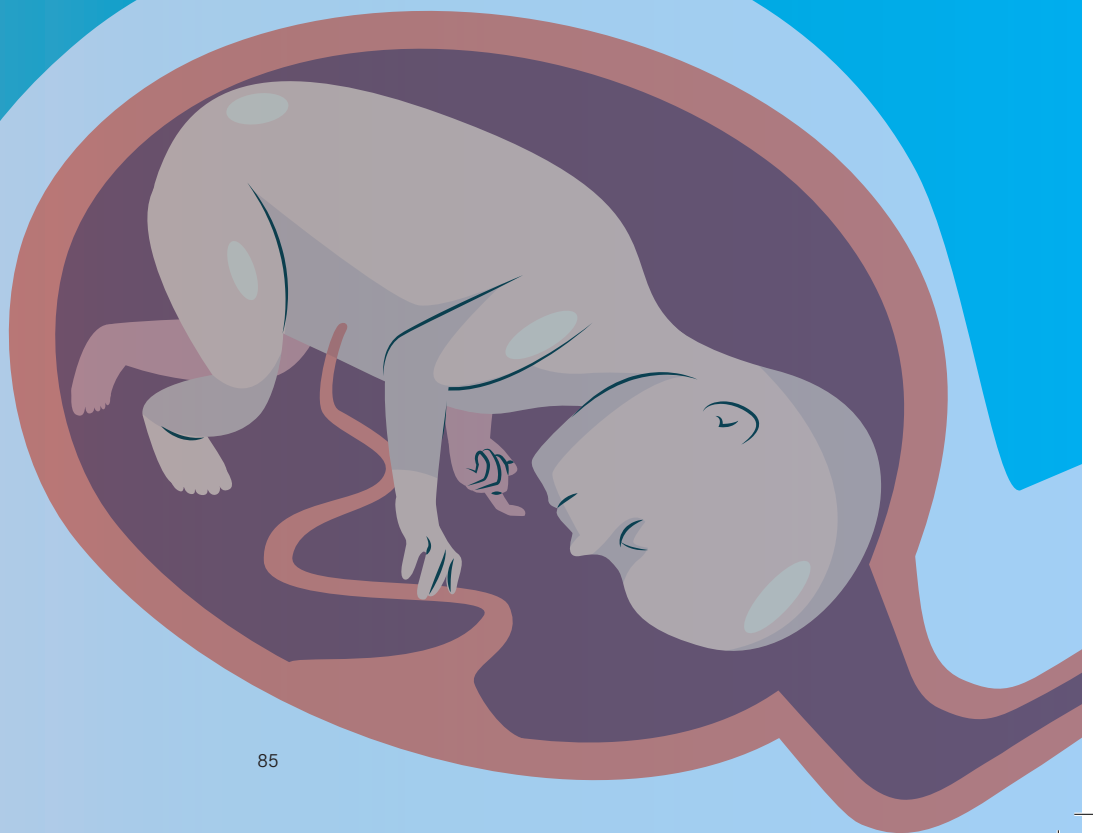


## CHAPTER 5

# MANAGEMENT OF LABOUR AND DELIVERY

Topics in this chapter

- » First stage of labour
- » Labour care guide
- » Second stage of labour
- » Third stage of labour
- » Induction of labour



## 5.1 FIRST STAGE OF LABOUR

Latent first stage of labour – a period of time, not necessarily continuous, when: there are painful contractions and there is some cervical change, including cervical effacement and dilatation up to 5 cm

Established first stage of labour – when there are regular painful contractions and there is progressive cervical dilatation from 4 cm

Labour Care Guide (LCG) is a WHO recommendations on intrapartum care specify evidence-based practices that should be implemented throughout labour and the immediate postnatal periods, and discourage ineffective practices that should be avoided. Labour care guide must be followed and should be used to document progress of labour and care and management of labour and birth

### 5.1.1 Assessment and management of first stage of labour

- » Initial assessment - history and vitals.
- » Perform abdominal examination - Fundal height, fetal lie, fetal position and presentation, duration and frequency of contractions, fetal heart rate
- » Perform vaginal examination-Dilatation, effacement, consistency and position of cervix Presentation and station and Membrane status

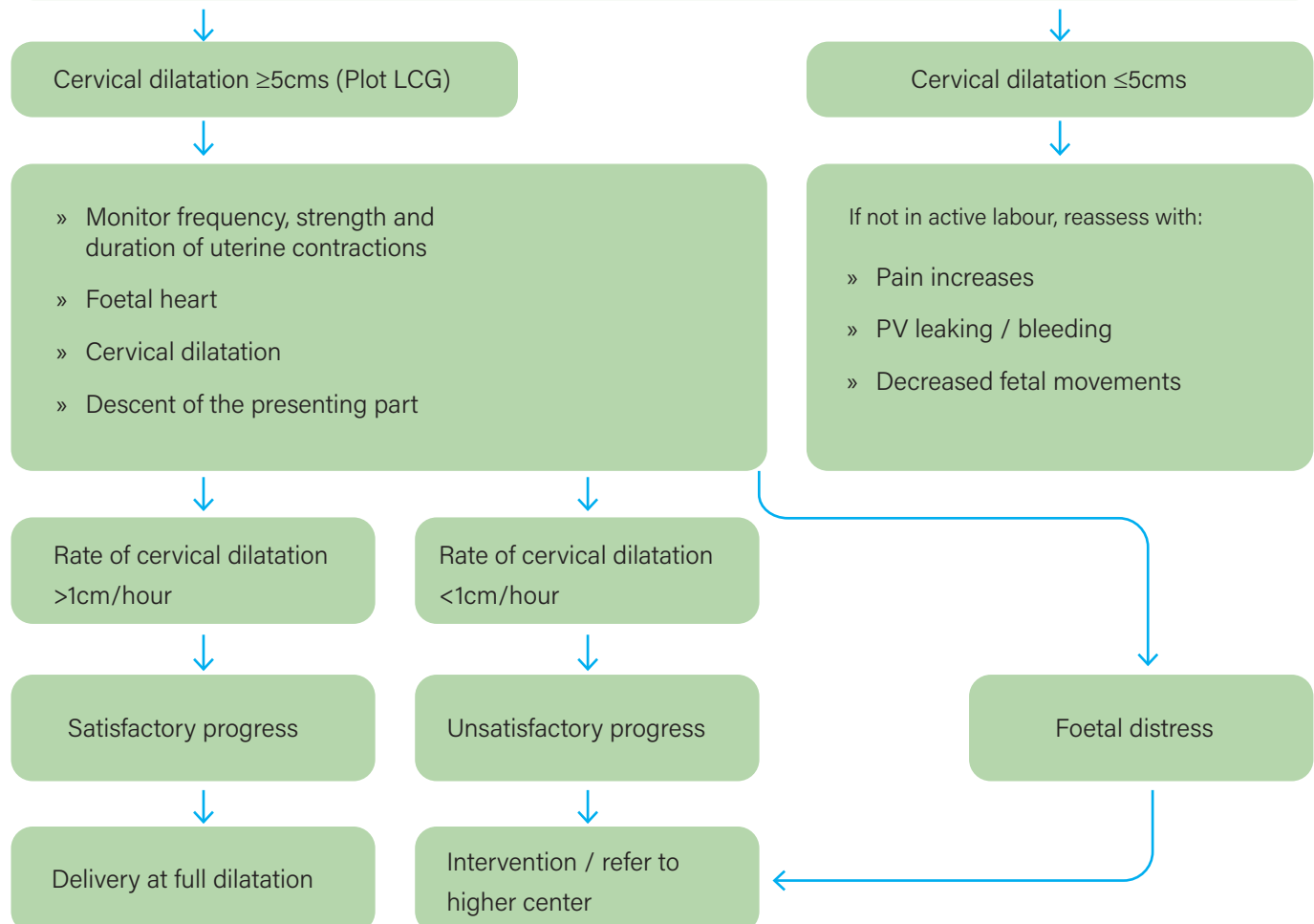


Figure 18: Assessment and management of labour

## 5.2 LABOUR CARE GUIDE

Documentation of the maternal, fetal condition and labour events must be maintained in the labour care guide once the mother is in active phase of labour.

The principal aims of the Labour Care Guide (LCG) are to:

- » Guide the monitoring and documentation of the well-being of women and babies and the progress of labour
- » Guide skilled health personnel to offer supportive care throughout labour to ensure a positive childbirth experience for women
- » Assist skilled health personnel to promptly identify and address emerging labour complications, by providing reference thresholds for labour observations that are intended to trigger reflection and specific action(s) if an abnormal observation is identified
- » Prevent unnecessary use of interventions in labour
- » Support audit and quality improvement of labour management
- » See Appendix 7 for WHO Labourcare guide

## 5.3 SECOND STAGE OF LABOUR

- » Passive second stage of labour: the finding of full dilatation of the cervix before or in the absence of involuntary expulsive contractions.
- » Active second stage of labour: expulsive contractions with a finding of full dilatation of the cervix

### 5.3.1 Observations during the second stage

- » Consider carry out the following:
  - ◇ Frequency of contractions once in every 5 minutes
  - ◇ Monitor BP, maternal PR, temperature
  - ◇ ensure emptying of bladder, check urine proteins and acetone
  - ◇ vaginal examination as indicated or in response to the progress of labour
- » Continue to take the woman's emotional and psychological needs into account.
- » Assess progress, which should include the woman's behaviour, the effectiveness of pushing and the baby's wellbeing, position and station at the onset of the second stage. These factors will assist in deciding the timing of further management.
- » Perform intermittent auscultation of the fetal heart rate immediately after a contraction for at least 1 minute, at least every 5 minutes. Palpate the woman's pulse every 15 minutes to differentiate between the two heartbeats.
- » Ongoing consideration should be given to the woman's position, hydration, coping strategies and pain relief throughout the second stage.

### 5.3.2 Duration of the second stage and definition of delay

#### For a nulliparous woman:

Diagnose delay in the active second stage when it has lasted 2 hours and prepare for operative birth. Birth would be expected to take place within 3 hours of the start of the active second stage in most women

#### For a multiparous woman:

- » Diagnose delay in the active second stage when it has lasted more than 1 hour and prepare for operative birth. Birth would be expected to take place within 2 hours of the start of the active second stage

### 5.3.3 Oxytocin in the second stage

Consideration should be given to the use of oxytocin, for nulliparous women if contractions are inadequate at the onset of the second stage. See figure 19 for positioning woman for pushing in second stage of labour

The woman's position and pushing in the second stage

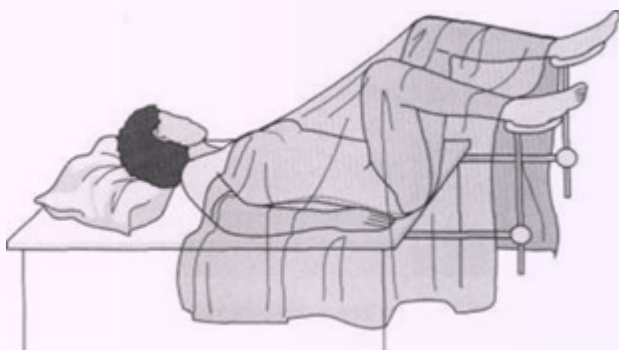


Figure 19: Position for birthing and pushing

- ◇ Discourage the woman from lying supine or semi-supine in the second stage of labour and encourage her to adopt any other position that she finds most comfortable.
- ◇ Inform the woman that in the second stage she should be guided by her own urge to push.
- ◇ If pushing is ineffective or if requested by the woman, offer strategies to assist birth, such as support, change of position, emptying of the bladder and encouragement.

### 5.3.4 Intrapartum interventions to reduce perineal trauma

Do not perform perineal massage in the second stage of labour.

Either the 'hands on' (guarding the perineum and flexing the baby's head) or the 'hands poised' (with hands off the perineum and baby's head but in readiness) technique can be used to facilitate spontaneous birth.

Do not carry out a routine episiotomy during spontaneous vaginal birth.

Perform an episiotomy with analgesia if there is a clinical need, such as instrumental birth or suspected fetal compromise.

If an episiotomy is performed, the recommended technique is a mediolateral episiotomy originating at the vaginal fourchette and usually directed to the right side. The angle to the vertical axis should be between 45 and 60 degrees at the time of the episiotomy. See figure 20.

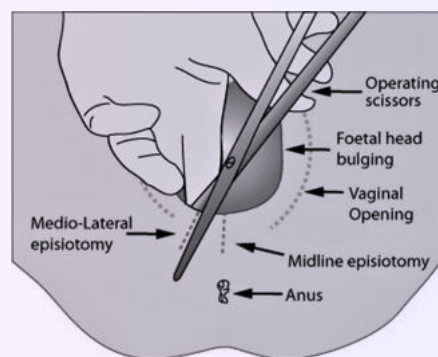


Figure 20: Episiotomy sites

## 5.4 THIRD STAGE OF LABOUR

The third stage of labour is the time from the birth of the baby to the expulsion of the placenta and membranes  
Diagnose a prolonged third stage of labour if it is not completed within 30 minutes of the birth

### 5.4.1 Observations in the third stage

- » Record vitals and assess her general condition
- » Check bleeding and uterine contractions
- » Manage if postpartum haemorrhage, a retained placenta or maternal collapse, or any other concerns about the woman's wellbeing
- » Carry out frequent observations to assess whether resuscitation is needed

### 5.4.2 Active Management of third Stage of Labour (AMTSL)

- » Administer 10 IU of oxytocin by intramuscular injection with the birth of the anterior shoulder or immediately after the birth of the baby and before the cord is clamped and cut
- » Delay cord clamping for 1 minutes from the birth of the baby unless there is a concern
- » Perform Controlled Cord Traction (CCT) as part of active management only after administration of oxytocin and signs of separation of the placenta. (see figure 21)

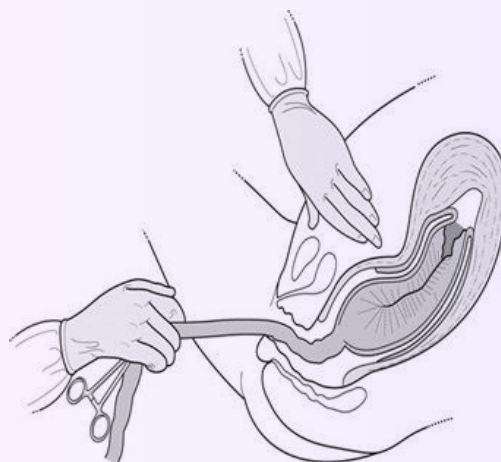


Figure 21: Controlled cord traction

## 5.5 INDUCTION OF LABOUR

Induction of labour (IOL) is defined as an intervention in which uterine contractions are artificially stimulated to initiate the process of labour.

This includes both women with intact membranes and women with spontaneous rupture of the membranes who are not in labour.

IOL is indicated when the benefits of delivery to the mother or the fetus outweigh the risks associated with induction of labor.

### 5.5.1 Indications for induction of labor

#### Medical

- » Post-dated pregnancy
- » DM or GDM
- » Preeclampsia  $\geq 37$  weeks
- » Gestational hypertension  $\geq 38$  weeks
- » Postdated ( $>41+0$  weeks), post term ( $>42+0$  weeks)
- » Oligohydramnios
- » Uncomplicated twin pregnancy  $\geq 38$  weeks
- » Preterm, or pre-labour rupture of membranes
- » Intrauterine growth restriction, or Suspected small for gestation age fetus
- » Rh - Isoimmunization
- » Intrahepatic cholestasis of pregnancy

#### Obstetric

- » Oligohydramnios
- » Polyhydramnios
- » Prolong latent phase
- » PROM
- » Stable antepartum hemorrhage
- » Congenital fetal anomalies
- » Rh isoimmunization
- » Intrauterine fetal demise
- » Chorioamnionitis
- » Abnormal CTG or BPP

### 5.5.2 Contraindications for induction of labor

#### Maternal:

1. Placenta praevia, vasa previa
2. Cord presentation
3. Previous 2 caesarean sections
4. Prior classical or inverted "T" uterine incision
5. Significant prior uterine surgery eg, full thickness myomectomy with breach of uterine cavity.
6. Active genital herpes
7. Pelvic structural deformities
8. Cervical cancer

#### Fetal:

1. Significant Macrosomia (fetal weight more than 4 kg)
2. Abnormal fetal lie or presentation (Brow, mentoposterior, transverse lie)
3. Non reassuring fetal status

### 5.5.3 Factors that influence the success rates of induction

- » Favorable cervix with Bishop's score of  $\geq 6$
- » Previous history of vaginal delivery

### 5.5.4 Informed Decision making

Discuss the risk and benefits of IOL considering individual needs and preferences to enable the woman to make an informed decision in consultation with the healthcare provider.

IOL discussion points include:

- » Indication of IOL
- » Method of IOL
- » Potential risk and benefits
- » Option if unsuccessful
- » Option if declined.



### 5.5.5 Documentations

Clear documentation is required on the in-patient chart including:

- » The indication for IOL
- » The content and outcome of counselling and discussion.
- » Informed consent.
- » Management and care provided (document on the IOL form)
- » Clinical signature and designation

### 5.5.6 Assessment before IOL

- » Review maternal history and reconfirm indication for IOL
- » Confirm gestational age
- » Recent USG (done within 2 weeks) for EFW, presentation AFI and placental localization.
- » CTG if available
- » Perform baseline maternal observation (TPR, BP).
- » Perform abdominal palpation to confirm presentation, lie, position and engagement
- » Assess membrane status (rupture/intact)
- » Vaginal examination to assess the cervix / Bishop's scoring

### 5.5.7 Cervical assessment:

Table 23: Modified Bishop's Score

	0	1	2	3
Cx dilatation	closed	1 to 2 cm	3 to 4 cm	≥5 to 6 cm
Effacement %	0 to 30	40 to 50	60 to 70	≥80
Station	-3	-2	-1, 0	+1, +2
Cervical Consistency	Firm	Medium	Soft	
Position of the cervix	Posterior	Mid-position	Anterior	

The cervix is unfavorable if MBS is 6 or less than 4.

### 5.5.8 Methods of Induction:

Two methods of induction are pharmacologic and non – pharmacological.

#### 5.5.8.1 Non-pharmacologic method

In non-pharmacologic method is indicated if:

- » Favorable cervix
- » ARM alone is not recommended as time to onset of contractions is unpredictable
- » To observe the color and amount of liquor if clinically indicated

The following are methods in which labour can be induced with non-pharmacologic methods.

1. Membrane Stripping - sweeping and stretching:
2. Local release of PG
3. Artificial rupture of membranes or amniotomy:

#### 5.5.8.2 Pharmacologic method

1. Mifepristone (used in abortions)
2. Dinoprostone. PGE<sub>2</sub>

Prostaglandins promotes cervical ripening and stimulate uterine contractions.

Dinoprostone preparation includes:

- » Vaginal gel (Prostaglandin E<sub>2</sub>)
- » Cerviprime gel 0.5mg

**Side effects:**

- » Nausea, vomiting
- » Diarrhea

**How to administer:**

- » Encourage to empty bladder

**Dosage:**

0.5mg Dinoprostone intracervically every 6th hourly up to 3 doses in 24 hours.

Prior to administration perform vaginal examination to assess MBS for cervical favorability.

After aseptic measure, with the use of Cusco's speculum, visualize the cervix and administer Dinoprostone gel intracervical.

### 5.5.9 Artificial rupture of membranes followed by oxytocin

Oxytocin: is synthesized in the supraoptic & paraventricular nucleus of hypothalamus. Secreted in posterior pituitary and stored. Oxytocin has a half-life of 5 to 10 mins.

#### How to administer:

Start a drip containing 2.5 units of oxytocin in 500ml of RL or saline at the rate of 10 drops / min and with increments till patient gets 3 to 4 contractions every 10 mins, lasting 30 to 40 secs.

#### Side effects of oxytocin:

- » Hypotension
- » Uterine tachysystole
- » Water intoxication due to its antidiuretic activity

### 5.5.10 Misoprostol

Synthetic Prostaglandin E1:

Helps in cervical ripening.

#### How to administer:

25mcg inserted in the posterior fornix every 4 to 6 hourly up to 5 doses

It can also be given oral or sublingual

Side effects: nausea, vomiting, pyrexia



**RECOMMENDED OXYTOCIN INFUSION: 6 hours after the last dose of Misoprostol**

### 5.5.11 Complications of IOL

- » Iatrogenic prematurity
- » Chorioamnionitis
- » Abruptio placentae
- » Cord prolapse
- » Hypertonic uterus
- » Uterine rupture
- » Failure of induction

## CHAPTER 6

# Pre labour Rupture of Membranes (PROM)

Topics in this chapter

» Pre labour Rupture of Membranes



## 6.1 PRELABOUR RUPTURE OF MEMBRANES

Prelabour rupture of membranes (PROM) is rupture of the membranes before labour has begun. PROM can occur either when the fetus is immature (preterm or before 37 weeks) and also called premature pre-labour rupture of membranes (PPROM) or when fetus is mature (at term).

### 6.1.1 Clinical features

- » Large gush of fluids down the legs followed by a steady trickle or feeling of wetness

### 6.1.2 Diagnosis

The typical odour of amniotic fluid confirms the diagnosis.

If membrane rupture is not recent or when leakage is gradual, confirming the diagnosis may be difficult. The following are possible methods to confirm diagnosis.

- » Place a vaginal pad over the vulva and examine it (visually and by odour) 1 hour later.
- » Use a high-level disinfected speculum for vaginal examination. Fluid may be seen coming from the cervix or forming a pool in the posterior fornix.
- » Ask the woman to cough; this may cause a gush of fluid.
- » If available, perform amnicator testing (see figure 22). Touch the swab against the fluid pooled on the speculum blade. A change from yellow to blue indicates alkalinity (presence of amniotic fluid). Blood and some vaginal infection may give a false positive result.



**Note:** A digital vaginal examination is best avoided unless there is a suspicion that the women may be in labour as it does not help establish the diagnosis and can introduce infection.

Figure 22: Amnicator



Intact membranes



Ruptured membranes



### 6.1.3 Differential Diagnoses

Table 24: Differential diagnosis of PROM

Symptoms and Signs Typically Present	Symptoms and Signs Sometime presents	Probable Diagnosis
» Watery vaginal discharge	» Sudden gush or intermittent leaking of fluid » Fluid seen at introitus » No contractions within one hour	Prelabour rupture of membranes
» Fever/chills pyrexia >38°C » Maternal tachycardia » Abdominal pain » Fetal tachycardia	» History of loss of fluid » Foul-smelling watery discharge after 22 weeks » Tender uterus » Light vaginal bleeding » Leukocytes of >15,000/mm <sup>3</sup>	Amnionitis
» Foul-smelling vaginal discharge » No history of loss of fluid	» Itching » Frothy/curd-like discharge » Abdominal pain » Dysuria	Vaginitis/cervicitis
» Bloody vaginal discharge	» Abdominal pain » Loss of fetal movements » Heavy, prolonged vaginal bleeding	Antepartum hemorrhage,
» Vaginal bleeding » Intermittent or constant abdominal pain		Abruptio placentae
» Blood-stained mucus or watery vaginal discharge (show)	» Cervical dilatation and effacement » Contractions	Possible Term or preterm labour

## 6.1.4 Assessment

### History

Confirm accuracy of Gestational age (by LMP/early USG)

Note the time and history of the reported vaginal fluid loss: -watery vaginal discharge, sudden gush or intermittent leaking of fluid, foul smelling discharge, bloody vaginal discharge (ante partum haemorrhage)

### Examination

- » Perform and record maternal temperature, pulse and blood pressure, respirations and oxygen saturation.
- » Auscultate the fetal heart rate and confirm presence of fetal movements
- » Perform an abdominal palpation noting: Symphysis fundal height, lie, gestational age, presentation, uterine tenderness/ irritability and uterine contractions
- » Use a vaginal speculum to assess vaginal discharge (amount, colour, odour) and exclude urinary incontinence

### Investigations:

- » Full Blood Count
- » CRP
- » HVS
- » Urine RE/CS

## 6.1.5 Management

Inform mother and family, the diagnosis treatment options and the need for transfer of care to a hospital with premature care facility with estimated time of inpatient care.

<p>Gestation &lt;37 weeks no signs of infections</p>	<ul style="list-style-type: none"> <li>» Antibiotics to reduce maternal and neonatal infective morbidity: Erythromycin 250 mg QID OR Amoxicillin 500 mg TDS PO for 7-10 days</li> <li>» Corticosteroids to the mother to improve fetal lung maturity (between 24 -34 weeks) Betamethasone 12 mg IM two doses 24 hours apart OR Dexamethasone 6 mg IM, four doses 12 hours apart</li> <li>» If gestational age &lt; 32 weeks and preterm birth is likely within the next 24 hours, consider Magnesium sulfate for neuroprotection.</li> <li>» Arrange in-utero transfer to a higher centre for NICU care in collaboration with pediatrician</li> </ul>
<p>Gestation &lt;37 weeks no signs of infections</p>	<ul style="list-style-type: none"> <li>» If the membranes have been ruptured for 18 hours or confirmed Group B streptococcus colonization, give prophylactic antibiotics ampicillin 2 g IV every six hours until birth, or Cefazolin 2gm IV stat and 6hourly even if the mother received antibiotics previously</li> <li>» Allow 12-24 hours time from the time of leaking for onset of spontaneous labour before proceeding to IOL.</li> <li>» Conservative management up to 72 hours may be considered at the discretion of the obstetrician</li> <li>» Induce and refer to IOL guideline</li> </ul>
<p>Any gestation with signs of infection</p>	<ul style="list-style-type: none"> <li>» Combination of antibiotics until the woman gives birth: - ampicillin 2 g IV every six hours; PLUS, gentamicin 5 mg/kg body weight IV every 24 hours.</li> <li>» Continue treatment for 24–48 hours after the symptoms and signs of infection have subsided.</li> <li>» Deliver by IOL/cesarean section</li> </ul>



# CHAPTER 7

## MALPOSITION AND MALPRESENTATION IN LABOUR

Topics in this chapter

- » Malpresentation
- » Malposition



## 7.1 MALPRESENTATION

Malpositions are abnormal positions of the vertex of the fetal head (with the occiput as the reference point) relative to the maternal pelvis. It can be Occiput transverse (LOT, ROT) or Occiput posterior position.

Abnormal lie is where the long axis of the fetus is not lying with the long axis of the uterus.




### 7.1.1 Types

- » Longitudinal may be cephalic or breech
- » Transverse lie
- » Oblique Lie
- » Unstable

### 7.1.2 Diagnosis of malposition

Diagnosis of malpresentation depends on the presenting part. Please refer to table 15 for the diagnosis of malposition.

Table 25: Diagnosis of malposition

Figure	Signs and symptoms
<p><b>Occiput posterior</b></p> 	<p>Occiput posterior position occurs when the fetal occiput is posterior in relation to the maternal pelvis.</p> <p>On abdominal examination: The lower part of the abdomen is flattened; fetal limbs are palpable anteriorly and the fetal heart may be heard in the flank.</p>
<p><b>Left occiput posterior</b></p> 	<p>On vaginal examination:</p> <p>The posterior fontanelle is towards the sacrum and the anterior fontanelle may be easily felt if the head is flexed.</p>
<p><b>Left occiput transverse</b></p> 	<p>Occiput transverse position occurs when the fetal occiput is transverse to the maternal pelvis. If an occiput transverse position persists into the later part of the first stage of labour, it should be managed as an occiput posterior position</p>

### 7.1.3 Management of occiput posterior positions

- » Spontaneous rotation to the anterior position occurs in 90% of cases. Arrested labour may occur when the head does not rotate and/or descend.
- » Birth of the baby may be complicated by perineal tears or extension of an episiotomy.
- » If fetal heart rate is normal, allow the woman to walk around or change position to encourage spontaneous rotation.
- » If fetal heart rate is abnormal (less than 100 or more than 180 beats per minute) at any stage, perform a caesarean
- » If the cervix is not fully dilated and there are no signs of obstruction, augment labour with oxytocin.
- » If the cervix is fully dilated but there is no descent in the expulsive phase of the second stage of labour, assess for signs of obstruction
- » If there are no signs of obstruction, augment labour with oxytocin
- » If the cervix is fully dilated:- If the fetal head is no more than 2/5 above the symphysis pubis, or the leading bony edge of the fetal head is at 0 station, assist birth of the baby using an obstetric vacuum or forceps. Otherwise, perform a caesarean

## 7.2 MALPRESENTATION

The fetus is in an abnormal position or presentation that may result in prolonged or obstructed labour. Malpresentations increase the risk for uterine rupture because of potential for obstructed labour.

### 7.2.1 Diagnosis

Firstly, determine the presenting part. The most common presentation is the vertex of the fetal head. If the vertex is the presenting part, use landmarks of the fetal skull to determine the position of the fetal head.

### 7.2.2 Diagnosis of malpresentations

1. **Brow presentation:** is caused by partial extension of the fetal head so that the occiput is higher than the sinciput (see figure 23).

*On abdominal examination* - more than half the fetal head is above the symphysis pubis and the occiput is palpable at a higher level than the sinciput.

*On vaginal examination* - the anterior fontanelle and the orbits are felt.



Figure 23: Brow presentation

2. **Face presentation:** is caused by hyper-extension of the fetal head so that neither the occiput nor the sinciput are palpable on vaginal examination (see figure 24).

*On abdominal examination* - a groove may be felt between the occiput and the back.

*On vaginal examination* - the face is palpated; the examiner's finger enters the mouth easily and the bony jaws are felt.



Figure 24: Face presentation

3. **Compound presentation** occurs when an arm prolapses alongside the presenting part. Both the prolapsed arm and the fetal head present in the pelvis simultaneously (see figure 25)



Figure 25: Compound presentation

4. **Breech presentation** occurs when the buttocks and/or the feet are the presenting parts (see figure 26).

*On abdominal examination* - the head is felt in the upper abdomen and the breech in the pelvic brim. Auscultation locates the fetal heart higher than expected with a vertex presentation.

*On vaginal examination during labour* - the buttocks and/or feet are felt; thick, dark meconium is normal. Types of breech presentations are described in table 26.



Figure 26: Breech presentation

Table 26: Types of breech presentation

#### Complete (flexed) breech

Occurs when both legs are flexed at the hips and knees.



#### Complete (flexed) breech

Occurs when one or both legs extended at the hips and flexed at the knees (extremely rare) increased risk of cord prolapse



#### Footling breech

Occurs when a leg is extended at the hip and the knee



#### Frank (extended) breech

Occurs when both legs are flexed at the hips and extended at the knees.



5. Transverse lie and shoulder presentation occur when the long axis of the fetus is transverse. The shoulder is typically the presenting part (see figure 27).

*On abdominal examination* - neither the head nor the buttocks can be felt at the symphysis pubis and the head is usually felt in the flank.

*On vaginal examination* - the buttocks and/or feet are felt; thick, dark meconium is normal.



Figure 27: Transverse lie

### 7.2.3 Management

#### Brow presentation

In brow presentation, engagement is usually impossible and arrested labour is common. It is unusual for spontaneous conversion to occur with an average-sized live fetus once the membranes have ruptured.

Mode of delivery: Cesarean section.

#### Face presentation

Prolonged labour is common. Descent and delivery of the head by flexion may occur in the mento-anterior position (see figure 28). In the mento-posterior position, however, the fully extended head is blocked by the sacrum. This prevents descent and labour is arrested.

##### Mento-anterior position:

- » If the cervix is fully dilated, allow to proceed with normal vaginal birth.
- » If there is slow progress and no sign of obstruction, augment labour with oxytocin.

If the cervix is not fully dilated and there are no signs of obstruction, augment labour using oxytocin. Review progress as with vertex presentation.



Figure 28: Mento-anterior

##### Mento-posterior position:

- » If the cervix is fully dilated, deliver by Caesarean section.
- » If the cervix is not fully dilated, monitor descent, rotation, and progress. If there are signs of obstruction, deliver by Caesarean section.
- » If the fetus is dead: Deliver by Caesarean section.

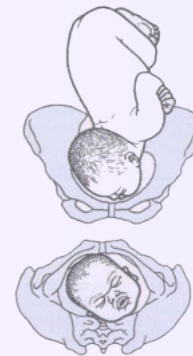


Figure 29: Mento-anterior



**Note: DO NOT deliver brow presentation by vacuum extraction or outlet forceps**

### Compound presentation

- » Spontaneous delivery can occur only when the fetus is very small or dead and macerated.
- » Arrested labour occurs in the expulsive stage.
- » Replacement of the prolapsed arm is sometimes possible:
  - ◇ Assist the woman to assume the knee-chest position as in figure 30
  - ◇ Push the arm above the pelvic brim and hold it there until a contraction pushes the head into the pelvis.
  - ◇ Proceed with management for normal childbirth.
  - ◇ If the procedure fails or if the cord prolapses, deliver by Caesarean section.



Figure 30: knee-chest position

## 7.3 BREECH PRESENTATION

Diagnosis is confirmed by USG.

- » Any breech presentation diagnosed after 37 weeks of pregnancy during early labour should be referred to a higher center.
- » Only complete and frank breech at the perineum should be delivered

### 7.3.1 Conducting Breech delivery:

Every breech delivery should take place in a hospital with surgical capability. Once the buttocks have entered the vagina and the cervix is fully dilated, tell the woman she can bear down with the contractions.

#### Delivery of the buttocks and legs:

- » When the breech distends the perineum, assess for the need of episiotomy.
- » Let the buttocks deliver until the lower back and then the shoulder blades are seen.
- » Gently hold the buttocks in one hand, but do not pull.
- » If the legs do not deliver spontaneously, deliver one leg at a time:
  - ◇ Push behind the knee to bend the leg
  - ◇ Grasp the ankle and deliver the foot and leg
  - ◇ Repeat for the other leg
- » Hold the baby by the hips (not by abdomen as it may injure internal organs). See figure 31.

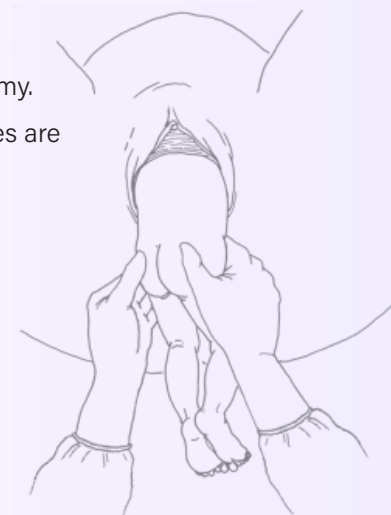


Figure 31: How to hold the baby

#### Delivery of the arms (felt on the chest):

- » Allow the arms to disengage spontaneously one by one. Only assist if necessary.
- » After spontaneous delivery of the first arm, lift the buttocks towards the mother's abdomen to enable the second arm to deliver spontaneously.
- » If the arm does not deliver spontaneously, place one or two fingers in the elbow and bend the arm, bringing the hand down over the baby's face.

#### Lovset's maneuver:

- » Using the pelvic grip on the fetus, the trunk is gently drawn downwards with its back in oblique anterior position. The baby is then lifted to cause upward and lateral flexion, which promotes descent of the post shoulder below the sacral promontory (see figure 32).
- » Using gentle traction and rotation, the posterior shoulder is rotated through 180 degrees to become the anterior shoulder.
- » At this point the anterior shoulder would be easily accessible below the symphysis pubis and the arm can be swept down across the fetal chest and delivered.



Figure 32: Lovset's maneuver

#### Delivery of the head: Mauriceau-Smellie-Veit (MSV) maneuver

- » Lay the baby face down with the length of its body over your hand and arm
- » Place the first and third fingers of this hand on the baby's cheekbones and place the second finger in the baby's cheek bones and flex the head
- » Use the other hand to hook the baby's shoulders with the index and ring fingers with the middle finger on the baby's occiput
- » Gently flex the baby's head towards the chest to bring the baby's head down until the hairline is visible.
- » Pull gently to deliver the head
- » Raise the baby, still astride the arm, until the mouth and nose are free
- » Deliver the baby on to the mothers abdomen



*Note: Ask an assistant to push above the mothers' pubic bone (Suprapubic pressure) as the head delivers. This helps to keep the baby's head flexed*



## CHAPTER 8

# COMPLICATIONS OF THIRD STAGE OF LABOUR

Topics in this chapter

- » PPH
- » Inversion of uterus
- » Uterine rupture
- » Retained placenta
- » Cord prolapse
- » Shock
- » Shoulder dystocia



## 8.1 POST-PARTUM HAEMORRHAGE (PPH)

PPH is a major cause of maternal mortality in the Maldives.

Vaginal bleeding in excess of 500 mL after vaginal delivery or 1000mL or greater following caesarean section is defined as postpartum haemorrhage (PPH).

- » Primary PPH is defined as increased vaginal bleeding within the first 24 hours after childbirth (immediate PPH).
- » Secondary PPH is increased vaginal bleeding that occurs following the first 24 hours after delivery of the baby and up to 12 weeks postpartum.

### 8.1.1 Causes

Causes includes The FOUR Ts. Table 27 explains the four T's and its specific cause.

Table 27: The four T's

FOUR Ts	SPECIFIC CAUSE
TONE	Atonic Uterus
TRAUMA	Lacerations, hematomas, inversion, rupture
TISSUE	Retained tissues, invasive placenta
THROMBIN	Coagulopathies

### 8.1.2 Risk factors for PPH

Risk factors include antepartum and intrapartum conditions. However, 20% of patients who develop PPH have no risk factors and its specific cause.

Table 28: Risk factors for PPH

ANTENATAL RISK FACTORS	LABOR RISK FACTORS	SURGICAL INTERVENTIONS
<ul style="list-style-type: none"> <li>» Previous history of PPH (Estimated 10% recurrence with subsequent deliveries).</li> <li>» Nulliparity.</li> <li>» Grand multiparity (&gt; 5 deliveries).</li> <li>» Coagulopathy (congenital or acquired including use of medication such as aspirin or heparin).</li> <li>» Abnormal placentation</li> <li>» Age &gt; 30 yrs</li> <li>» Over distension of the uterus: <ul style="list-style-type: none"> <li>◇ Multiple gestation.</li> <li>◇ Polyhydramnios.</li> <li>◇ Fetal macrosomia</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>» Prolonged labor (first, second, and/ or third stage).</li> <li>» Pre-eclampsia and related disorders</li> <li>» Fetal demise</li> <li>» Induction or augmentation of Labor</li> <li>» Use of Magnesium Sulphate.</li> <li>» Chorioamnionitis.</li> </ul>	<ul style="list-style-type: none"> <li>» Operative vaginal delivery.</li> <li>» Cesarean section.</li> <li>» Episiotomy.</li> </ul>

### 8.1.3 Prevention

- » The best preventive strategy is Active Management of Third Stage of Labor (AMTSL). This includes:
  - ◊ Administering Oxytocin (10 IU – IM) with, or soon after, the delivery of anterior shoulder of the baby.
  - ◊ Delay cord clamping and cutting at least up to 1 minute
  - ◊ Controlled Cord Traction (CCT) to deliver the placenta.
  - ◊ Uterine massage after delivery of placenta.
- » Administration of uterotonics is the most important step in reducing PPH.
  - ◊ Oxytocin: IV or IM is the preferred uterotonic agent for prevention of PPH.
  - ◊ Inj. Methylergometrine (Methergin) 0.2mg IV/IM. Repeat 2-4 hourly up to 5 doses.
  - ◊ Tab Misoprostol: 600mcg – 800 mcg PR
  - ◊ Inj. Carboprostol 250mcg-800mcg PR
  - ◊ Tranexamic acid 1g can be administered by slow IV over 10 minutes

To perform CCT, grasp the cord with one hand and gently apply traction while simultaneously applying suprapubic (NOT fundal) pressure with the other hand (called the "Brandt maneuver")



*Note: for patients with high risk of PPH, cross-matched blood should be readily available*

### 8.1.4 Diagnosis and management

Preparedness, early recognition and quick response, reduces morbidity associated with both primary and secondary PPH. Figure 33 shows the flowchart for management of PPH.

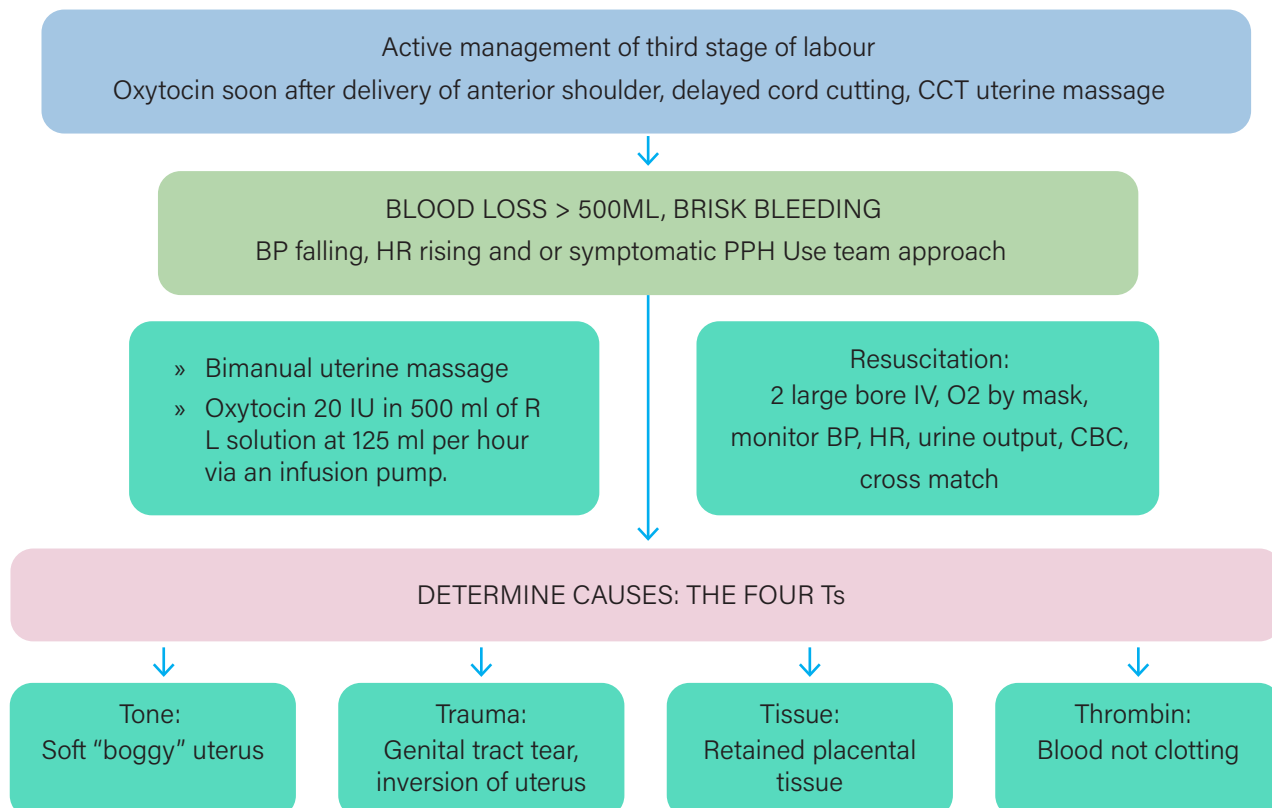
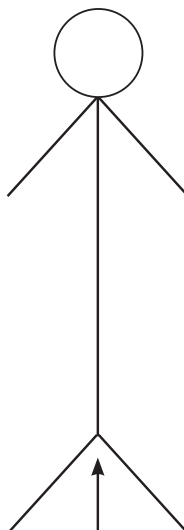


Figure 33: Flow chart for management of PPH

## FLOW CHART: INITIAL MANAEMENT OF MASSIVE PPH - ORGANIZING THE TEAM:

<p>Helper 1 ..... HEAD</p> <ul style="list-style-type: none"> <li>• Check Airway <input type="checkbox"/> time.....</li> <li>• Check BREATHING <input type="checkbox"/> time.....</li> <li>• Administer OXYGEN <input type="checkbox"/> time.....</li> <li>• Lie FLAT <input type="checkbox"/> time.....</li> </ul> <p>(Note time of reievant EVENTS, Reassure woman &amp; Partner)</p>		<p>Helper 3 .....ARM 2</p> <ul style="list-style-type: none"> <li>• SYNTOCINON 20 UNT IN RL500ML Time.....</li> <li>• METHERGIN 0.2MG IV/IM Time.....</li> <li>• PROSTODIN (CARBOPROST) or PGF2a (HEMABATE) 250 MCG IM -rpt after 15mins (maximum x 8 doses- is 2 dose should consider moving to theatre). Time..... Time.....</li> <li>• MISOPROSTOL 800mcg - 1000mcg PR. Time.....</li> </ul>
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<p>Helper 2 ..... ARM 1</p> <ul style="list-style-type: none"> <li>• Check BP &amp; pulse <input type="checkbox"/> time.....</li> <li>• 16 G Cannula <input type="checkbox"/> time.....</li> <li>• 4-6 units c-match sent <input type="checkbox"/> time.....</li> <li>• FBC &amp; CLOTTING sent <input type="checkbox"/> time.....</li> <li>• kept extra seum sample <input type="checkbox"/> time.....</li> <li>• FLIUDS RESUSCITATION <input type="checkbox"/> time.....</li> </ul> <p>(initially x 2l crystalloid)</p> <p>Fluid..... time.....</p> <p>Fluid..... time.....</p> <p>Blood..... time.....</p> <p>Blood..... time.....</p> <p>Blood..... time.....</p>	<p>NAME: _____ UTERUS</p> <ul style="list-style-type: none"> <li>• START HERE: CALL FOR HELP: (Minimum 3 helpers and GMO)</li> <li>• Massage the uterus:</li> <li>• CO-ORDINATE: <ul style="list-style-type: none"> <li>◊ HELPER 1 at "HEAD"</li> <li>◊ HELPER 2 and 3 at "ARMS"</li> </ul> </li> <li>• Catheterize patient:</li> <li>• Review other causes: (FOUR Ts) <ul style="list-style-type: none"> <li>◊ TONE: is the uterus contracted? Contracted: <input type="checkbox"/> Relaxed: <input type="checkbox"/></li> <li>◊ TRAUMA: Are there any tears/laceration? YES: <input type="checkbox"/> NO: <input type="checkbox"/></li> <li style="padding-left: 40px;">If YES Specify.....</li> <li>◊ TISSUE: Are there any placental bits?/check the placenta. Complete: <input type="checkbox"/> Incomplete: <input type="checkbox"/></li> <li>◊ THROMBIN: Is the blood clotting? YES <input type="checkbox"/> NO: <input type="checkbox"/></li> </ul> </li> <li>• ATONY persist? YES: <input type="checkbox"/> NO: <input type="checkbox"/> If YES-Bimanual compression applied:</li> <li>• SHIFT EARLY TO OPERATING ROOM IF BLEEDING PERSIST. Shifted time.....</li> <li>• TOTAL BLOOD LOSS:.....</li> <li>• BLEEDING CONTROLLED TIME:.....</li> </ul> <p>Name:..... Designation:..... Signature:.....</p>
---	---

Figure 34: Initial management of massive PPH. Adapted from IGMH:

### Situations when the obstetrician must be informed and present

- » Blood loss >1000ml
- » Pulse rate > 110/min
- » Systolic BP <90mmhg
- » Drop of SDP by 30mmhg
- » Increase of PR by >30bpm
- » Increasing fundal height
- » Deterioration of the patient out of proportion to the overt blood loss

### 8.1.5 Approach to a woman with PPH

Once excessive blood loss is suspected, treatment must be initiated quickly by progressing through to determine the cause (Tone, Trauma, Tissue, and Thrombin).

As seen in Figure 34 flow chart for management of PPH, many of the steps in diagnosis and management must be carried out simultaneously.

- » Call for help
- » Maintain a calm atmosphere.
- » Keep the mother and her family informed and reassured
- » Use a team approach to manage PPH
- » Ensure there is intravenous access with two wide (14- 16 G) bore cannulae.
- » Send blood for cross matching and baseline full blood count. In cases of massive haemorrhage, other investigations will be needed.
- » Start crystalloid (RL/ NS) solution.
- » Keep the woman warm. (Pay attention to the temperature of labor room, operating theatre, intravenous fluids, blood, blood products and fluids used for lavage. Hypothermia is known to promote coagulopathy)
- » Where available, the early involvement of the anesthetic team, even while the patient is still in the labor room is recommended.
- » Give oxygen via a face mask at a minimum rate of 8L/ minute (where suitable masks are available, oxygen must be given at a rate of 10-15L/min).
- » If deterioration of the patient is greater than expected for the visible blood loss, internal hemorrhage is the probable cause.
- » Check for completeness of the placenta. If incomplete or in doubt consider exploration of the uterus under anesthesia.
- » Identify the cause of hemorrhage
  - ◊ Palpate the uterine fundus.

A poorly contracted uterus usually indicates atonic PPH, which is the commonest cause. However, the possibility of concomitant genital tract trauma needs to be considered. If the uterus is well contracted, the genital tract must be inspected for trauma with adequate exposure, in good light.

### 8.1.6 Management of atonic haemorrhage

- » Start uterine massage by rubbing up the fundus.
- » Clear the cervical canal and vagina of blood clots by vaginal examination.
- » Start an infusion of Oxytocin 20IU in 500ml of RL solution at 125 ml per hour via an infusion pump.
- » Administer Ergometrine 0.2 mg slow IV or IM
- » Start bimanual compression of uterus
- » If the bleeding fails to abate completely in 10-15 minutes, repeat ergometrine 0.2mg IV
- » If the bleeding fails to abate completely in a further 15 minutes administer Carboprost 250 mcg IM (can be repeated every 15 min. up to 8 doses)
- » At the same time, administer misoprostol 800mcg PR
- » Tranexamic acid 1g can be administered by slow IV over 10 minutes

#### Procedure for Bimanual compression

With one hand:

- » Keeping fingers straight and thumb tucked in palmer side of the index finger, insert hand in to vagina with palm facing the woman's thigh
- » Once finger meet resistance roll the hand so that palm is facing upward and curl fingers in to a fist, placing thumb on top of index finger
- » Place the fist in to the anterior fornix of the vagina and apply upward pressure.

With the other hand:

- » Identify the uterine fundus.
- » Deeply palpate to situate fingers behind the fundus
- » Cupping the fundus compress it firmly around the intravaginal fist.
- » Maintain compression and evaluate effect.

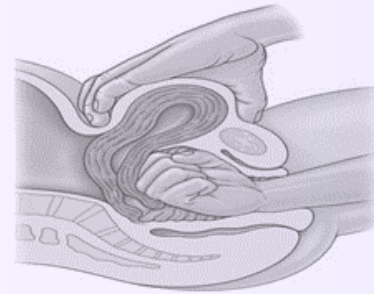


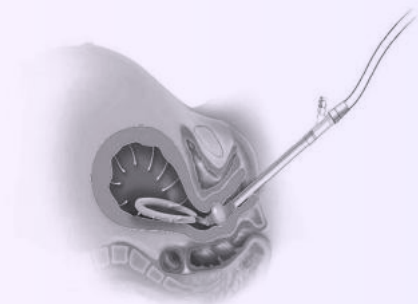
Figure 35: Bimanual compression



Figure 36: external bimanual compression

#### Procedure for balloon tamponade

- » Empty uterine cavity of clots
- » Insert the end of the balloon through the cervix in to the uterine cavity, ensuring the balloon is completely inside the uterus.
- » Inflate the balloon with sufficient volume of ward saline (approximately 250 – 500 ml); The uterus should now be firm with minimal blood loss.
- » Assess blood loss through drainage portal for tamponade effect. If bleeding continues tamponade ineffective and surgical intervention required.



#### Tamponade and surgical technique for pph:

- » Vaginal packing:
- » 4-inch gauze soaked with 5000 units of thrombin in 5 mL of sterile saline.
- » Balloon tamponade / Foley catheter
- » B-Lynch compression sutures – performed at LSCS
- » Hysterectomy – early decision form hysterectomy maybe taken depending on the condition of the patient, available recourses and expertise.

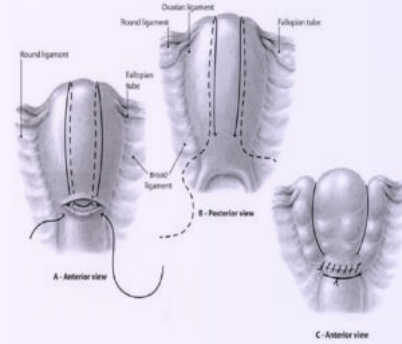


Figure 37: B Lynch uterine compression sutures

### 8.1.7 Management off traumatic PPH

- » Exclude high vaginal and cervical tears before suturing episiotomy.
- » When the apex of the tear or episiotomy is not visible, apply a suture at the highest visible point, pull downwards and apply continuous sutures at progressively higher points until the apex is reached.
- » Examine for paravaginal and broad ligament haematomata with a combined per vaginal and per rectal examination.
- » The management should be individualized according to the situation.
- » Paravaginal hematomas of more than 5 cm diameter will usually require surgical evacuation. A bleeding point is usually present and must be looked for. In cases where it is difficult to control bleeding, a Foley catheter with its balloon inflated may be left in the cavity. Packing of the vagina may also be useful.
- » Cervical tears must be identified by systematic inspection of the cervix using Green Armytage forceps and sutured.
- » In case of multiple tears with venous oozing, it may be better to insert a balloon catheter into the vagina or to pack the vagina with moistened vaginal packs than to try to suture all the tears.

### 8.1.8 Debriefing and Documentation

The use of structured documentation is important to follow up of the process of the management of PPH. This will enable to review the case with potential medico-legal consequences. Also, it will be helpful to reflect back on the practice and improve.

It is recommended that one member of staff is delegated specifically for this task and to coordinate with other relevant disciplines.

- » It is possible that a major PPH could result in significant psychological morbidity.
- » This could be minimized by timely debriefing of the patient and her family, preferably by a team.
- » This should be done immediately after the event, before discharge and at the postnatal visit or at any time as requested by her or the family.
- » It is good practice to conduct a case review with the members of the team involved in the management and other staff as soon as possible after the event. The spirit of such a meeting should be one of lessons learnt rather than of apportioning blame.



**Note: An ongoing chronological record of patient's condition and interventions must be maintained throughout the management of PPH**

### 8.1.9 Fluid replacement

Table 29: Fluid replacement in PPH

Class 1	Class 2	Class 3	Class 4
crystalloids 3:1 (3 ml of crystalloid should be used as replacement for every 1 ml blood loss)	crystalloids + Colloids ( Up to 2l Crystalloids and 1.5 L of colloids)	Crystalloids + Colloids + PRBC	Crystalloids + Colloids + PRBC

Blood products	Volume (ml)	Contents	Effect per unit
PRBC	240	RBC, WBC, and plasma	▲ hematocrit 3%, Hb 1gm/dl
Platelet	50	RBC, WBC, and plasma	▲ platelet count by 5000-10000/mm <sup>3</sup>
FFP	240	Fibrinogen, Antithrombin III, factor V, factor VIII	▲ fibrinogen by 10mg/dl
Cryoprecipitate	40	Fibrinogen, factor VII and XIII and VW factor	▲ fibrinogen by 10mg/dl

### 8.1.10 Postnatal care after PPH

- » Hemodynamic state:
  - ◇ Transfer to High dependency / Intensive Care Unit for observation and monitoring.
  - ◇ If condition not critical – observe in LR for 2 hours and once stable transfer to postnatal ward.
  - ◇ First 24 hours post-delivery, monitor vitals, uterine tone, blood loss and input and output charting every 2 hourly.
  - ◇ After 24 hours post-delivery – monitoring as per standard monitoring.
- » Hemoglobin and other blood investigations:
  - ◇ Six hours after stabilization and repeat after 24 hrs



## 8.2 INVERSION OF UTERUS PPH

It is an extremely rare and life-threatening complication in the third stage of labour in which the uterus is turned inside out partially or completely. Inversion may be spontaneous or commonly induced.

### 8.2.1 Risk factors

- » Placental abnormalities
- » CCT without counter traction in an uncontracted uterus

### 8.2.2 Clinical features

- » Severe abdominal pain during delivery of the placenta
- » Features of shock (mainly neurogenic)
- » Uterine fundus not felt on abdominal palpation
- » Mass in the vagina
- » Postpartum haemorrhage
- » Placenta may or may not be delivered

### 8.2.3 Clinical management

- » Start maternal resuscitation
- » If the woman is in severe pain, adequate analgesia (Pethidine 50mg and Diazepam 5 mg IV slowly)
- » Leave the placenta attached
- » Arrange transfer to theatre for reduction under anesthesia if repositioning unsuccessful.
- » Reduction of uterine inversion. The inverted uterus is replaced by applying firm pressure with a gloved hand. (See figure 38)

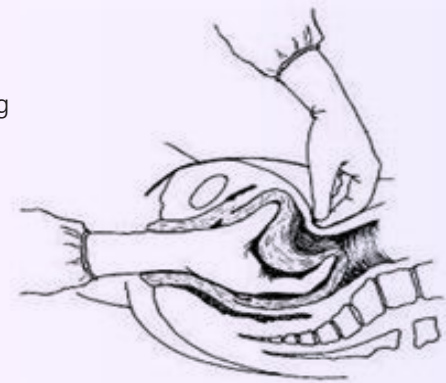


Figure 38: Repositioning of uterus

**!** *Note: An ongoing chronological record of patient's condition and interventions must be maintained throughout the management of PPH*

### 8.2.4 Post procedure care

- » Once the inversion is corrected, infuse Oxytocin 20 units in 500ml IV fluids (normal saline or ringer's lactate) at 10 drops per minute.
- » Give a single dose of prophylactic antibiotics
- » Give appropriate analgesic drugs.

## 8.3 RETAINED PLACENTA

Placenta and membranes are not delivered within 30 minutes after delivery of the baby.

### 8.3.1 Causes

- » Adherent placenta
- » Placental abnormalities
- » Cord detachment

### 8.3.2 Risk factors

- » Previous retained placenta
- » Preterm delivery
- » Previous uterine surgery (e.g., curettage/Cesarean Section)
- » Young maternal age

### 8.3.3 Management

- » Ensure adequate analgesia
- » Intra umbilical vein injection of 20IU of oxytocin in 20ml saline
- » If still undelivered, proceed to manual removal in operation theatre. (See figure 39)
- » Ensure counselling and consent (risks include infection, haemorrhage and trauma to the womb and birth canal)
- » Anesthesia
- » Prophylactic IV antibiotic



*Note: Women should be advised to report all vaginal bleeding to their antenatal care provider*

### 8.3.5 Manual removal of placenta

One hand supports and guards the uterine fundus abdominally whilst the other advances along the line of cleavage of the placenta, separating it in its entirety.



Figure 39: Manual removal of placenta

## 8.4 SHOCK

Shock is characterized by failure of the circulatory system to maintain adequate perfusion of the vital organs. Shock is a life-threatening condition that requires immediate and intensive treatment.

Suspect or anticipate shock if any of the following conditions is present:

- » Bleeding in early pregnancy
- » Bleeding in late pregnancy or labour
- » Postpartum haemorrhage
- » Severe infection (e.g., unsafe or septic abortion, amnionitis, metritis)
- » Trauma

### 8.4.1 Diagnosis

- » Fast, weak pulse:  $>110$  /min
- » Low blood pressure: systolic  $<90$  mmHg

### 8.4.2 Clinical Manifestation

- » Pallor
- » Sweatiness or cold clammy skin
- » Rapid breathing: respiration rate of  $> 30$  breaths/min
- » Anxiousness, confusion or unconsciousness
- » Scanty urine output:  $<30$ ml/hour

### 8.4.3 Immediate management

- » Shout for help. Urgently mobilize all available personnel.
- » Monitor vital signs (pulse, blood pressure, respiration, temperature).
- » Make sure that the airway is not obstructed.
- » Give oxygen at 6-8L per minute by mask or nasal cannula.
- » Tilt woman to the left side (15°-30°).
- » Keep the woman warm (without overheating her).
- » Start an IV infusion (two, if possible) using a large-bore (16-gauge or largest available) cannula or needle. Collect blood for estimation of haemoglobin, blood grouping, immediate cross-matching and bedside clotting test, just before infusion of fluids.
- » Rapidly infuse IV fluids (0.9% NS or Ringer's lactate) initially at a rate of 1 L in 15-20 minutes.
- » Give at least 2 L of these fluids in the first hour.
- » Continue to monitor vital signs (every 15 minutes) and blood loss.
- » Catheterize the bladder and monitor urine output and fluid intake.
- » Determine the cause of shock after the woman is stabilized, and manage the cause of shock.
- » Reassessment
  - ◇ Reassess the woman's response to fluids within 30 minutes to determine if her condition is improving. Signs of improvement include:
    - Stabilizing pulse: rate of 90 per minute or less
    - Increasing blood pressure: systolic of 100 mmHg or more
    - Improving mental status: less confusion or anxiety
    - Increasing urine output: 30 ml per hour or more
  - ◇ If the woman's condition improves adjust rate of infusion of IV fluids to 1 L in 6 hours.
  - ◇ Continue management for the underlying causes of shock.
  - ◇ Monitor fluid balance and avoid over hydrating. If the woman starts having shortness of breath and/or swollen limbs, lower infusion rate to 0.5ml/min (8-10 macro-drops/min).
- » Consider referral as appropriate.



*Note: A more rapid rate of infusion is required in the management of shock resulting from bleeding. Aim to replace two to three times the estimated fluid loss.*

### 8.4.4 Haemorrhagic shock

If heavy bleeding is suspected as the cause of shock:

- » Take steps to stop bleeding (e.g., oxytocic, uterine massage, bimanual compression, aortic compression, preparations for surgical intervention).
- » Transfuse as soon as possible to replace blood loss.
- » Determine the cause of bleeding and manage accordingly:
  - ◊ If bleeding occurs during the first 22 weeks of pregnancy, suspect abortion, ectopic or molar pregnancy.
  - ◊ If bleeding occurs after 22 weeks or during labour but before delivery, suspect placenta praevia, abruptio placentae or ruptured uterus
  - ◊ If bleeding occurs after childbirth (postpartum haemorrhage), suspect ruptured uterus, uterine atony, tears of the genital tract, retained placenta or placental fragments

### 8.4.5 Septic shock

If infection is suspected as the cause of shock:

- » Collect appropriate samples (blood, urine, pus) for microbial cultures before starting antibiotic therapy, if the facility is available.
- » Give the woman a combination of antibiotics to cover aerobic and anaerobic infections and continue until she is fever-free for 48 hours:

Ampicillin 2 g IV every 6 hours

+

Gentamicin 5 mg/kg body weight IV every 24 hours

+

Metronidazole 500 mg IV every 8 hours

- » Give 30 ml/kg iv crystalloid fluids within the first 3 hours, if no response consider vasopressors.



*Note: Do not give oral antibiotics to a woman in shock*

### 8.4.6 Anaphylactic shock

Anaphylactic shock is a life-threatening allergic reaction to an antigen and is associated with systemic dilation that causes low blood pressure.

#### 8.4.6.1 Management

- » Stop contact with suspected allergen
- » Give Adrenaline 1:1000 0.5ml IM repeated every 10 minutes if necessary
- » Give Hydrocortisone 100mg IV
- » Give Pheniramine Maleate 25-50 mg IM or IV
- » Severe or recurrent signs may require Hydrocortisone 2mg/kg body weight IV every 4 hours until condition improves

## 8.5 MATERNAL COLLAPSE

Acute event involving the cardio respiratory system and/or brain, resulting in reduced or absent conscious level at any stage in the pregnancy up to 6 weeks after delivery. It is a rare but life-threatening event which can have many causes. The outcome for mother and fetus depends on prompt and immediate resuscitation. In the event of Maternal death, case should be reported to Quality Assurance and Regulations Division of Ministry of Health within 24 hours. Maternal Reporting form attached in appendix 8.

### 8.5.1 Causes

Obstetric causes	Incidental causes
<ul style="list-style-type: none"><li>» PPH</li><li>» Eclampsia</li><li>» Amniotic fluid embolism</li><li>» Uterine rupture</li><li>» Uterine inversion</li><li>» Intra-abdominal bleeding</li><li>» Unrecognized genital tract hematomas</li></ul>	<ul style="list-style-type: none"><li>» Massive thromboembolic event (pulmonary embolism)</li><li>» Cardiac cause arrhythmias and failure</li><li>» Myocardial infarction</li><li>» Cerebrovascular accident</li><li>» Subarachnoid haemorrhage</li><li>» Septic and anaphylactic shock</li><li>» Metabolic and endocrine cause</li><li>» Ruptured hepatic, splenic and aortic aneurism</li><li>» misuse of medication/substance</li></ul>

### 8.5.3 Management

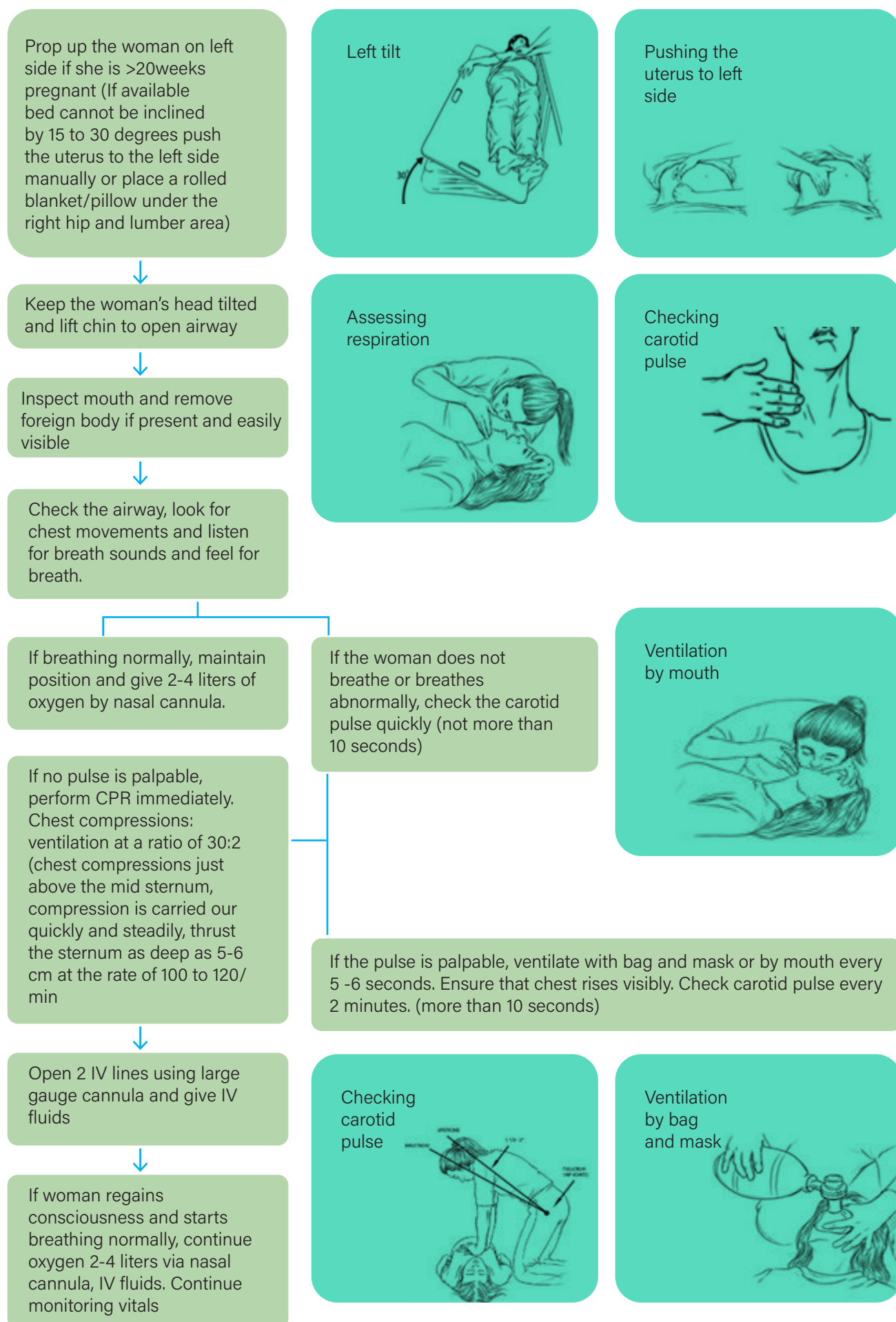


Figure 40: Management of maternal collapse

## 8.6 CORD PROLAPSE

Abnormal descent of the umbilical cord by the side of the presenting part in the context of ruptured membranes. It can be through the cervix alongside (occult) or past (overt).

### 8.6.1 Causes

- » Malpresentations
- » Contracted pelvis
- » Prematurity
- » Obstetric interventions (ARM, External Cephalic Version ECV), induction of labour)
- » Multiple pregnancy
- » Polyhydramnios
- » Abnormal placentation
- » Unengaged head, parous
- » Fetal congenital abnormalities
- » Unstable lie



### 8.6.2 Evaluation

#### History

- » Risk factors for cord prolapse
- » Ruptured membranes
- » Recent obstetric interventions

#### Observations and examinations

A vaginal examination should be performed promptly after rupture of membranes or with suspicious CTG abnormalities to exclude cord prolapse

### 8.6.3 Investigations

- » CTG may show persistent variable decelerations or a profound bradycardia
- » USG +Doppler to see cord presentation or occult prolapse (if no fetal distress)

### 8.6.4 Delivery

- » Unless vaginal delivery is imminent, CS should be performed
- » Check viability with doppler or USG before the incision
- » Applying vacuum is appropriate in selected cases (Full dilatation with engaged head)



## 8.6.5 Management

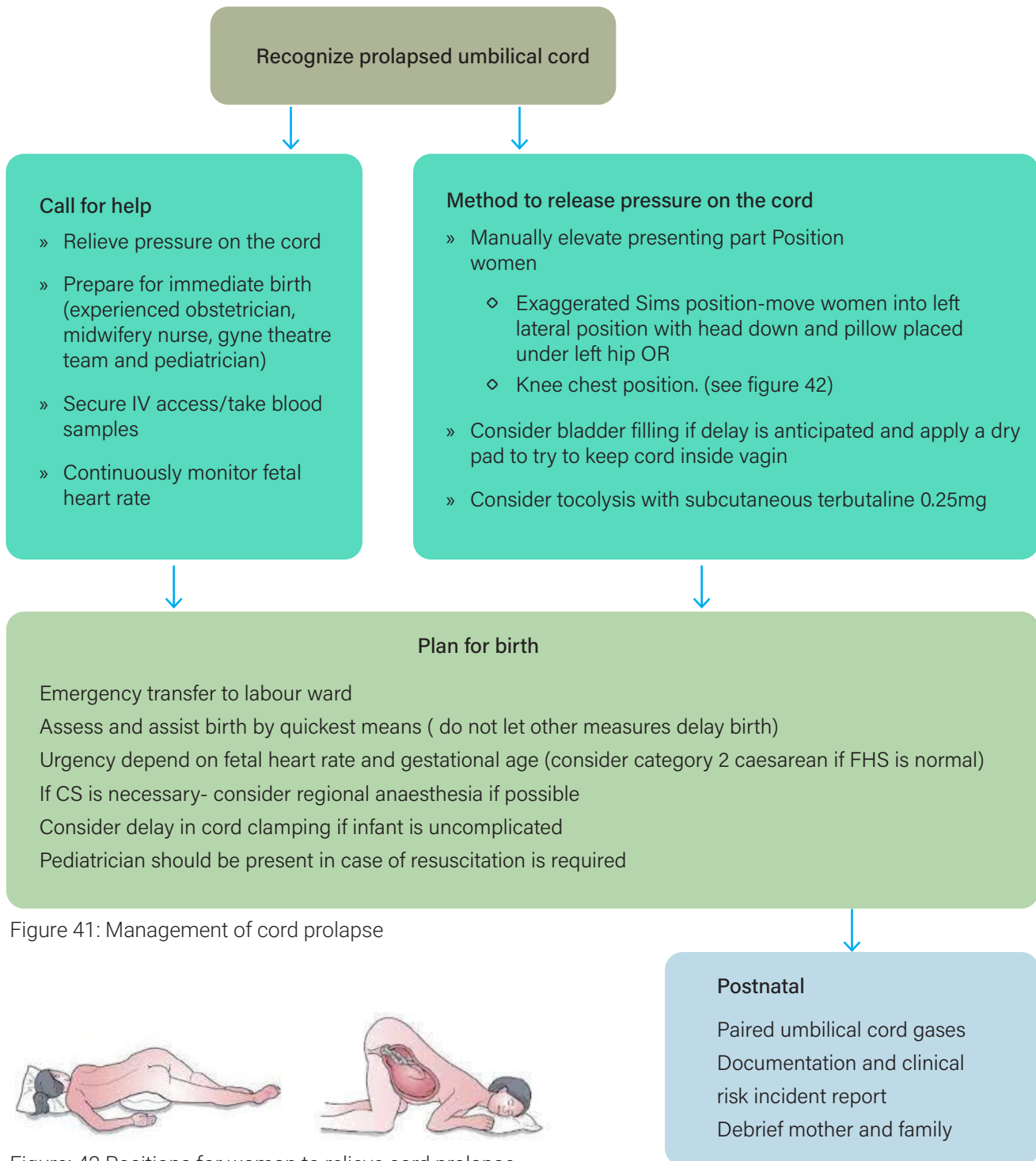


Figure 41: Management of cord prolapse

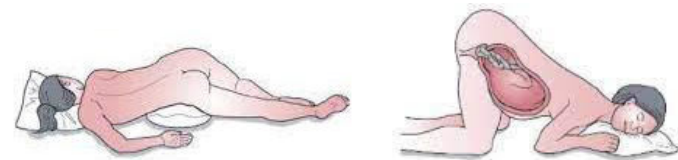


Figure 42 Positions for woman to relieve cord prolapse.



**Note: Proper documentation Debrief the couple after delivery**

## 8.7 SHOULDER DYSTOCIA

- » The fetal head has been delivered but the shoulders are stuck and cannot be delivered.
- » Be prepared for shoulder dystocia at all deliveries, especially if a large baby is anticipated.
- » Have several persons available to help
- » Shoulder dystocia cannot be predicted.

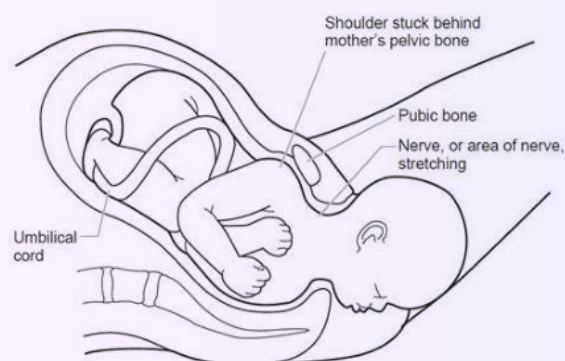


figure 43: Shoulder Dystocia

### 8.7.1 Diagnosis

- » The fetal head is delivered but remains tightly applied to the vulva.
- » The chin retracts and depresses the perineum.
- » Traction on the head fails to deliver the shoulder, which is caught behind the symphysis pubis. In shoulder dystocia, usually head-to-body delivery time is >60 seconds.

### 8.7.2 Management – HELPERR

- » **H- Help** - Shout for help. Urgently mobilize all available personnel.
- » **E- Evaluate episiotomy** - Make an adequate episiotomy to reduce soft tissue obstruction and to allow space for manipulation.

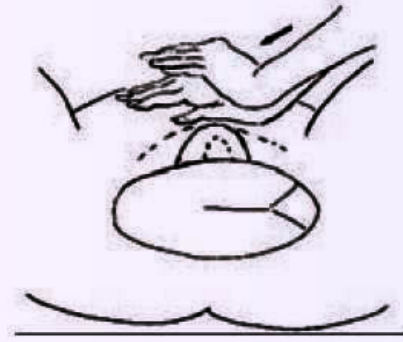
#### » L – Legs - McRoberts Maneuver

- ◇ With the woman on her back, ask her to flex both thighs, bringing her knees as far up as possible towards her chest.
- ◇ Ask two assistants to push her flexed knees firmly up onto her chest
- ◇ Apply firm, continuous traction downwards on the fetal head to move the shoulder that is anterior under the symphysis pubis.
- ◇ Avoid excessive traction on the fetal head as this may result in brachial plexus injury.

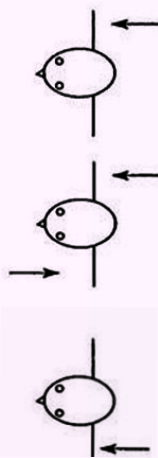


- » **P-Pressure** - Have an assistant simultaneously apply suprapubic pressure downwards to assist delivery of the shoulder.

- ◊ Do not apply fundal pressure. This will further impact the shoulder and can result in uterine rupture



- » **E - Enter rotational maneuver if the shoulder still is not delivered:**



Rubin II

At vaginal examination apply pressure as indicated. If shoulders move into the oblique diameter, attempt delivery.

Rubin II + Woods corkscrew maneuver

Rubin II + Woods corkscrew maneuver If unsuccessful, add the Woods corkscrew maneuver and continue rotation in the same direction. Use both hands and apply pressure as indicated. If shoulders now move into the oblique, attempt delivery. If this is unsuccessful, continue rotation 180 degrees and deliver

Reverse Woods corkscrew maneuver

If the last maneuver is unsuccessful, change to reverse Woods corkscrew maneuver. Slide fingers down to back of posterior shoulder and attempt 180-degree rotation in the opposite direction.

NOTE: Rubin I = suprapubic pressure.

- » **R - Remove the posterior arm**

If the shoulder still is not delivered despite the above measures: Insert a hand into the vagina Grasp the humerus of the arm that is posterior and, keeping the arm flexed at the elbow, sweep the arm across the chest. This will provide room for the shoulder that is anterior to move under the symphysis pubis.

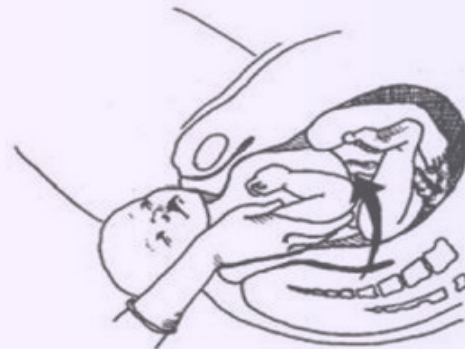


Figure 44: Removal of posterior arm

- » **R- Roll the patient** on all fours if all of the above measures fail to deliver the shoulder

- ◊ All maneuvers can be repeated on all fours. Often the change of position already frees the shoulder and there will be more space for all the posterior intra-vaginal maneuvers.



**Be prepared for PPH after shoulder dystocia**

### 8.7.3 Documentation

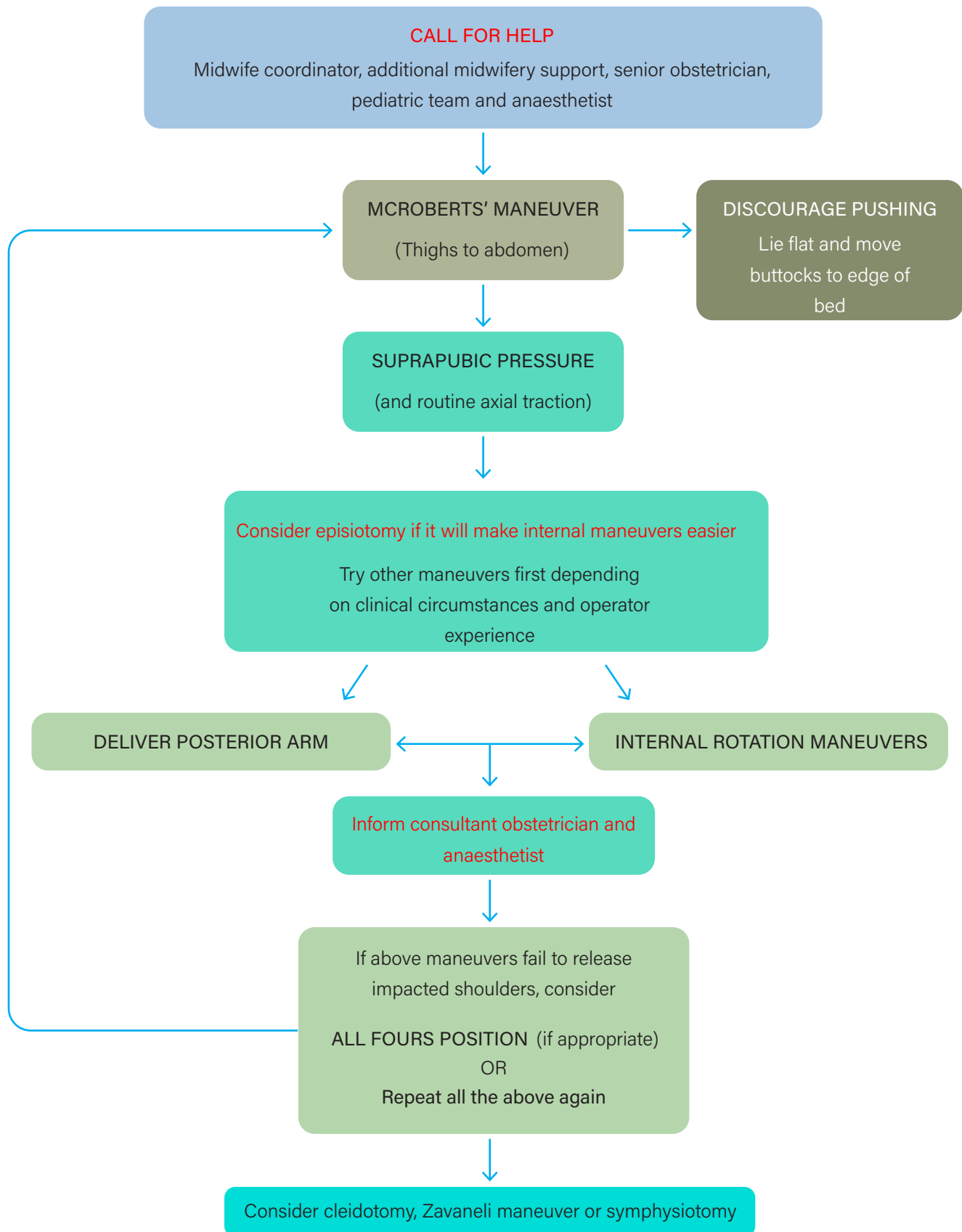
The use of structured documentation is important to follow up of the process of the management of shoulder dystocia. This will enable to review the case with potential medico-legal consequences. Also, it will be helpful to reflect back on the practice and improve.

*\*As an example, use the shoulder dystocia documentation sheet in appendix 9 and follow the points below. All shoulder dystocia should be reported to Quality Assurance and Regulations Division (QARD). See appendix 10 for shoulder dystocia reporting form.*

#### Points required in shoulder dystocia documentation

- ◇ Time of delivery of head and time of the delivery of body
- ◇ Anterior shoulder at the time of the dystocia
- ◇ Maneuvers performed, their timing and sequence
- ◇ Maternal perineal and vaginal examination
- ◇ Estimated blood loss
- ◇ Staff in attendance and the time they arrived
- ◇ General Condition of the baby (Apgar score)
- ◇ Umbilical cord blood acid-base measurements (if available)
- ◇ Neonatal assessment of the baby
- ◇ It is particularly important to document the position of the fetal head at delivery as this facilitates identification of the anterior and posterior shoulder during the delivery
- ◇ Monitoring neonatal injury (bony fractures/ Brachial plexus injury- Erb's palsy Klumpke's palsy)
- ◇ Ensure to inform neonatal team at diagnosis of shoulder dystocia to attend birth asphyxia
- ◇ Staff attendance at annual training as yearly basis
- ◇ It is important to debrief and to counsel staff and family

### 8.7.4 Algorithm for management of shoulder dystocia



Baby to be reviewed by pediatrician after birth and referred for consultant neonologist for any concerns  
 DOCUMENT ALL ACTIONS ON **PROFORMA** AND COMPLETE CLINICAL INCIDENT REPORTING FORM

Figure 45: Algorithm for management of shoulder dystocia. Source RCOG

# CHAPTER 9

## POSTNATAL CARE

Topics in this chapter

- » Postpartum care of mother
- » Care of newborn at birth
- » Birth asphyxia and resuscitation
- » Breast feeding
- » Low birth weight babies



## 9.1 POSTNATAL CARE OF THE MOTHER

Postnatal period is defined as the first six weeks after birth. This is an important period for health of the mother and the baby. The mother needs extra care for early detection of any complications. Immediate treatment will reduce maternal mortality and long-term maternal morbidity. There are many complications which may happen during postnatal period.

### 9.1.1 Postnatal observation

#### Care during immediate postnatal period (first 2 hours)

- » Check BP, Pulse, Temperature every 15 minutes in 1st hour
- » Abdominal examination- for fundal height and uterine contraction
- » Assess the amount of vaginal bleeding every 15 minutes
- » Encourage the woman to drink
- » Keep the baby and mother together and encourage skin to skin contact
- » Do not leave mother and baby unattended
- » Encourage the woman to pass urine
- » Initiate breast feeding within the first hour
- » After 2 hours, if no problems accompany the mother and baby while shifting to the ward

#### Care during the first 24 hours

- » Check BP, pulse, temperature every 6 hours
- » Assess the amount of vaginal bleeding
- » Encourage early mobilization
- » Keep the baby and mother together
- » Encourage the mother to eat and drink
- » Educate on personal hygiene and danger signs
- » Counsel on birth spacing and family planning

### Danger signs

- » Inform about physiological process of recovery after birth
- » Warn about signs and symptoms of PPH and seek immediate medical attention if any of these are present
  - ◇ Sudden profuse blood loss or increase in bleeding
  - ◇ Fainting
  - ◇ Dizziness
  - ◇ Palpitations and tachycardia
  - ◇ Vaginal bleeding: more than 2 or 3 pads soaked in 20-30 minutes after delivery
  - ◇ Bleeding increases after delivery
  - ◇ Fast or difficult bleeding
  - ◇ Severe abdominal pain
- » Ask the women to report these signs and seek medical attention immediately
  - ◇ Signs of infection
    - Fever
    - Abdominal pain
    - Feeling ill
    - Swelling in breast
    - Painful micturition
    - Pain in perinium and draining pus
    - Foul smelling lochia

## 9.1.2 Complications

The following are the common complications:

- » Vaginal bleeding: This may be atonic postpartum haemorrhage or bleeding from vaginal, perineal or cervical tears
- » Infection: Postnatal women may develop uterine infection, urinary tract infection or breast abscess. This should be diagnosed and managed appropriately.
- » Anaemia: A routine check of haemoglobin should be done in the postpartum period and anaemia treated if detected.



### 9.1.3 Discharge planning and follow-up

- » Encourage adequate rest and sleep
- » Balanced nutritional diet and hydration
- » Personal / hand hygiene and wound care
- » Encourage exclusive breast feeding (see protocol on breast feeding)
- » Newborn care
- » Advise on routine and follow up postpartum visits
- » Give iron and calcium supplementation
- » Advise on danger signs in mother and newborn.
- » Counsel on family planning
- » Advice to avoid sexual intercourse until perineal wound (from episiotomy or repair of tears) heals

## 9.2 BREAST FEEDING

Infants should be exclusively breastfed for the first six months and beyond 2 years of life to achieve optimal growth, development and health.

### 9.2.1 Advantages of breastfeeding

- » Best natural food for babies.
- » Always clean.
- » Protects the baby from diseases.
- » Makes the child more intelligent.
- » Available 24 hours a day and requires no special preparation.
- » Nature's gift to the infant and does not need to be purchased.
- » Makes a special relationship between mother and baby.
- » Helps parents to space their children.
- » Helps a mother to shed extra weight gained during pregnancy.

### 9.2.2 Early initiation of breastfeeding

Early initiation of breastfeeding is extremely important for establishing successful lactation as well as for providing 'colostrum' (mother's first milk) to the baby. Ideally, the baby should receive the first breastfeed as soon as possible and preferably within half 30 minutes of birth. The new born baby is very active during the first half an hour and if the baby is kept with the mother and effort is made to breastfeed, the infant learns sucking very first. This early suckling by the infants starts the process of milk formation in the mother and helps in early secretion of breast milk. In case of caesarean deliveries, newborn can be started with breastfeeding within an hour with support.

### 9.2.3 Immediate support to initiate and establish breastfeeding

- » Early and uninterrupted skin-to-skin contact between mothers and infants should be facilitated and encouraged as soon as possible after birth
- » All mothers should be supported to initiate breastfeeding as soon as possible after birth, within the first hour after delivery
- » Mothers should receive practical support to enable them to initiate and establish breastfeeding and manage common breastfeeding difficulties
- » Mothers should be coached on how to express breast milk as a means of maintaining lactation in the event of their being separated temporarily from their infants

## 9.2.4 Feeding practices and additional needs of infants

- » Mothers should be discouraged from giving any food or fluids other than breast milk, unless medically indicated
- » Mothers should be supported to recognize their infants' cues for feeding, closeness and comfort, and enabled to respond accordingly to these cues with a variety of options, during their stay at the facility providing maternity and newborn services
- » For preterm infants who are unable to breastfeed directly, non-nutritive sucking will be beneficial until breastfeeding is established
- » If expressed breast milk or other feeds are medically indicated for feeding, methods such as cups and spoons feeding are recommended
- » To enable mothers to establish and sustain exclusive breastfeeding for 6 months,
  - ◊ *Early initiation of breastfeeding* - within the first hour of life
  - ◊ *Exclusive breastfeeding* - the infant only receives breast milk without any additional food or drink, not even water
  - ◊ *Breastfeeding on demand* - as often as the child wants, day and night
- » Exclusive breastfeeding is recommended from birth until 6 months of age.
- » Continued breastfeeding, with adequate complementary foods, is recommended from 6 months to 2 years and beyond
- » Health workers have the responsibility to encourage mothers to breastfeed and to help them overcome any difficulties.
  - ◊ Help the mother to breastfeed.
  - ◊ Make sure the newborn is attached well to the breast. Signs of good attachment are:
    - Areola visible above infant's mouth
    - Mouth wide open
    - Lower lip turned out
    - Infant's chin touching the breast.
- » Make sure the mother holds her newborn correctly to support breastfeeding. The newborn:
  - ◊ Should be held close to the mother.
  - ◊ Should face the breast.
  - ◊ Body should be in a straight line with the head.
- » Effective suckling
  - ◊ Baby take slow deep suckling, pause and again continue
- » Whole body should be supported If a baby cannot suckle effectively in the first week or two, help the mother to:
  - ◊ Express her milk and feed it to her baby with a cup – this helps to keep breasts soft and easier for the baby to attach to the breast
  - ◊ Express a little milk directly into her baby's mouth
  - ◊ Continue to give baby skin-to-skin contact
  - ◊ Breastfeed the baby in different positions at different feeds

### 9.2.5 Attachment and different positions for breastfeeding

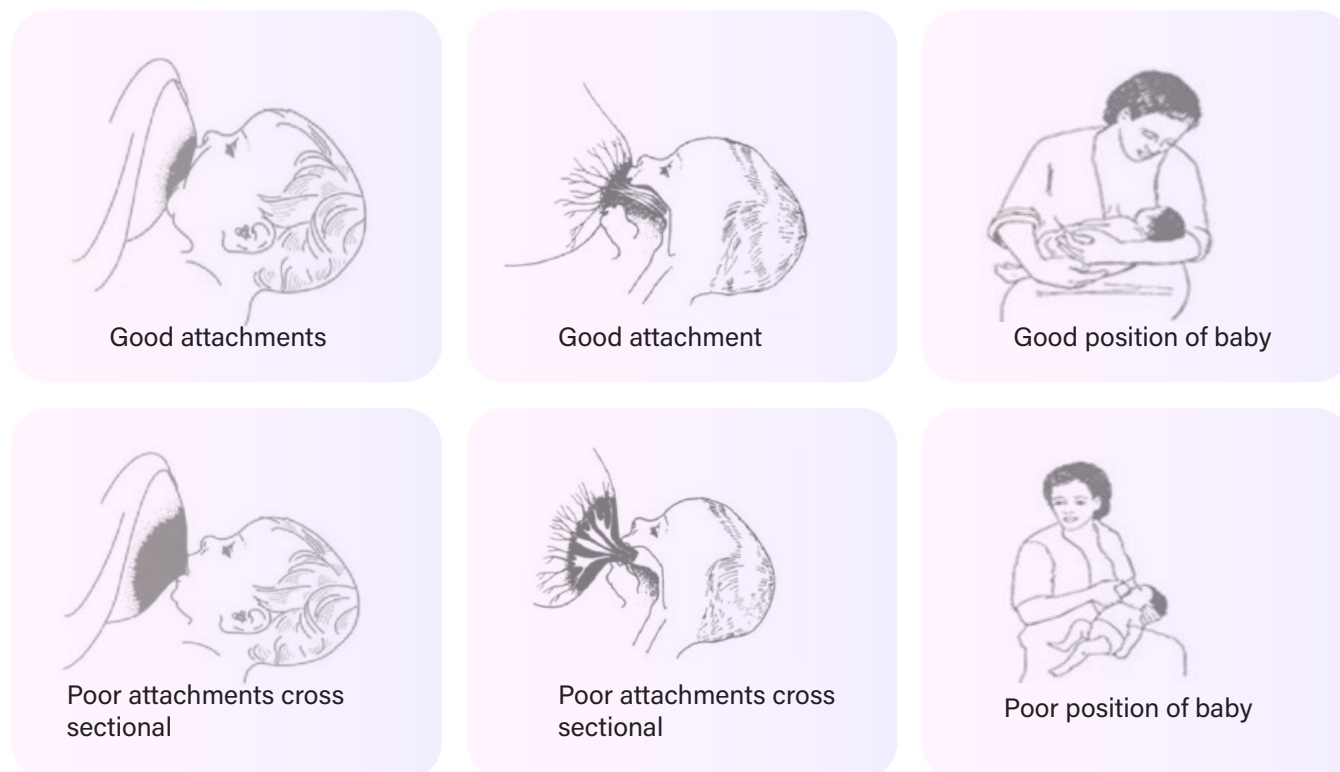


Figure 46: Attachments and different positions for breastfeeding

### 9.2.6 Different maternal positions for breastfeeding



Figure 47: Different maternal positions for breastfeeding

### 9.2.7 Care of the breast

*No specific care of the breast is needed for normal breastfeeding* - Breasts do not need to be washed before or after feeds – normal bath daily once is necessary. Washing removes natural oils from the skin, and makes soreness more likely

Advise the mother to:

- » Avoid medicated lotions and ointments
- » Rub hind milk on areola after feeds

### 9.2.8 Flow chart for management of breastfeeding

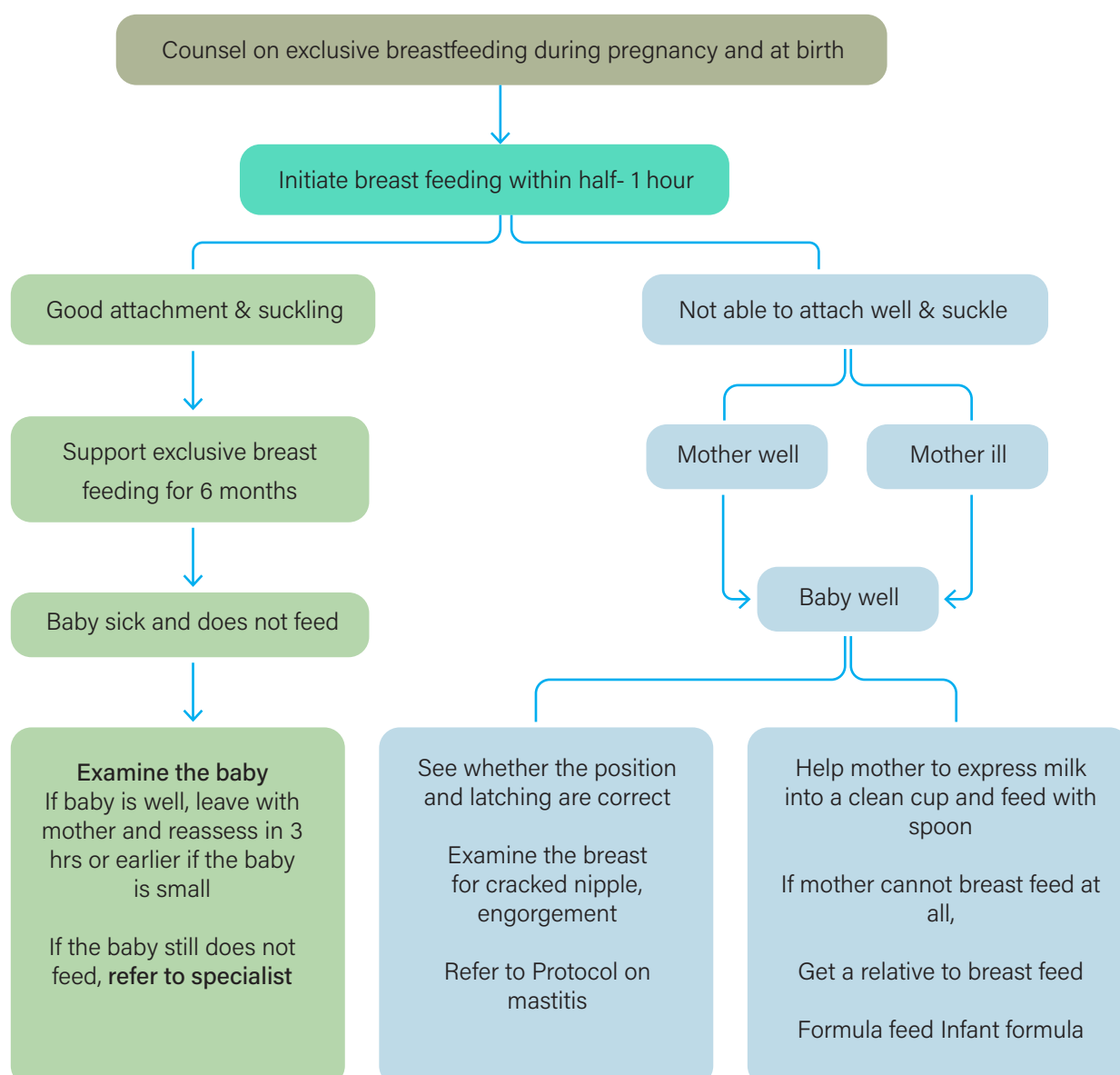


Figure 48: Flow chart for management of breastfeeding

## 9.3 MASTITIS

Mastitis is an infection of the tissue of the breast that occurs most frequently during the time of breast feeding. It can occur when bacteria, often from the baby's mouth, enter a milk duct through a crack in the nipple

### 9.3.1 Causes of painful breast

- » Breast engorgement

Breast engorgement is an exaggeration of the lymphatic and venous engorgement that occurs before lactation. It is not the result of over distension of the breast with milk. Occurs around the first 3-4 post-partum day.

- » Breast infection – Mastitis or abscess

- » Nipple soreness or crack- occurs when the baby is not well attached to the breasts during feeding.

### 9.3.2 Management of breast engorgement

If the woman is breastfeeding

- » If the woman is breastfeeding and the baby is not able to suckle, encourage the woman to express milk by hand or with a pump.
- » If the woman is breastfeeding and the baby is able to suckle:
  - ◇ Encourage the woman to breastfeed more frequently, using both breasts at each feeding.
  - ◇ Show the woman how to hold the baby and help it attach.
- » Counsel the woman on relief measures.
- » Give paracetamol 500 mg by mouth as needed.
- » Follow up in 3 days to ensure response.
- » Relief measures before feeding may include:
  - ◇ Apply warm compresses to the breasts just before breastfeeding, or encourage the woman to take a warm shower.
  - ◇ Massage the woman's neck and back.
  - ◇ Have the woman express some milk manually before breastfeeding and wet the nipple area to help the baby latch on properly and easily.
- » Relief measures after feeding may include:
  - ◇ Use a supportive bra
  - ◇ Apply cold compress to the breasts between feedings to reduce swelling and pain.

## Assessment and management of Mastitis

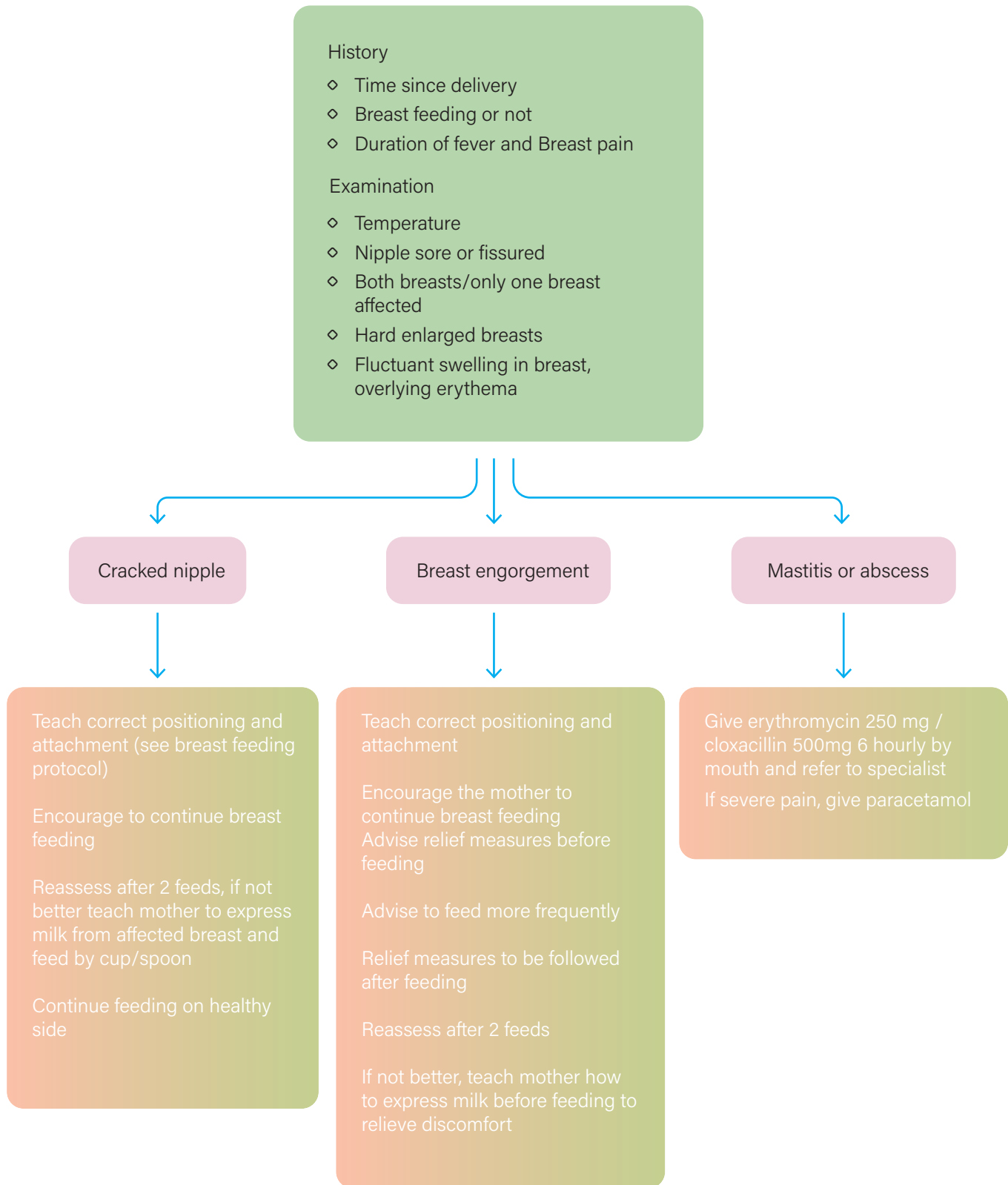


Figure 49: Assessment and management of mastitis

## 9.4 CARE OF THE NEW BORN AT BIRTH

### 9.4.1 Personal and equipment at delivery

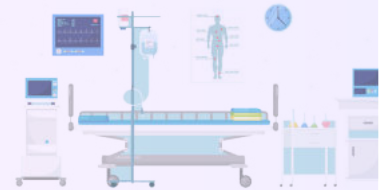
A doctor or a nurse trained in neonatal resuscitation must be physically available at the time of birth of all infants irrespective of their risk status (high or low). The health professionals play an important role at the time of delivery of the new born and provide help in preventing complications and ensuring survival.

The new born resuscitation corner must be physically located in the delivery room itself. The health professional designated to care for the baby at birth should check for the "Resuscitation Preparedness" at the birthing place well in time before the baby is delivered.



### 9.4.2 Preparation of the room for receiving the new born

1. Ensure that neonatal resuscitation trolley is ready and functional
2. Assure that all surfaces, linens, supplies and equipment are clean
3. Put the radiant warmer on
4. Put two clean towels under the warmer to warm them for receiving the baby
5. Maintain labour room temperature at 26 -28 degree
6. Provide enough light to assess baby colour and breathing
7. Prepare for recording new born details in appropriate forms



### 9.4.3 Standard precautions and asepsis at birth

The health professional attending the delivery must adhere to the standard precautions and use appropriate personal protective equipment. It is important to observe five cleans:

- (1) Clean hands: appropriate hand-hygiene and wearing sterile gloves
- (2) Clean surface: use clean and sterile towel to dry and cover the baby
- (3) Clean cut: the umbilical cord should be cut with a clean and sterile blade or scissor
- (4) Clean tie: the cord should be clamped with a clean and sterile clamp or tie
- (5) Clean cord: one should not apply anything to cord



### 9.4.4 The basic needs of a normal baby at birth

The four basic needs of all babies at the time of birth (and for the first few weeks of life) are

1. Warmth
2. Normal breathing
3. Breastfeeding/expressed breast milk
4. Prevention of infection

All newborn requires these Essential Neonatal Care to minimize the risk of illness and maximize their growth and development.





### 9.4.5 Immediate Care of normal new born at the time of birth

#### **Dry, stimulate and wrap baby**

- » Receive the baby on mother abdomen and dry the baby using pre-warm towels thoroughly giving special attention to head, axilla, and groin taking care not to remove the vernix (vernix has protective functions)
- » Remove the wet towel and continue skin to skin contact
- » Cover the baby using another pre- warmed towel.
- » Check whether baby cried at birth/spontaneous breathing
- » Delay cord clamping to 1-3 minutes if situation permits
- » Clamp the cord after pulsation stops: (two clamps should be applied approximately 8-10cm away from the umbilicus)
- » Cut the cord between the two clamps

#### **Assessment of new born after delivery**

- » Apgar score
- » Breathing, grunting or gasping, other signs of respiratory distress (nasal flaring, retractions)
- » Heart rate, and auscultation for murmurs
- » Any dysmorphic features (eg: syndromic facies)
- » Weight, length and OFC measured against the chart
- » If preterm or gestational age not known then, Ballard score
- » reflexes: sucking, rooting, moro, grasp reflex

#### **Ensuring warmth: Warm chain**

##### **At delivery**

- » Warmer should be on 100% heat on manual mode 20-30 minutes prior to delivery.
- » Clothes should be pre warmed under radiant warmer
- » Skin to skin contact with mother (drying and immediate care may be given while on mother's abdomen)

##### **After delivery**

- » Keep the baby clothed and wrapped with the head covered
- » Rooming in

### 9.4.6 Apgar Scoring

Apgar scores should be recorded at 1 minutes, 5 minutes and 10 minutes of birth.

Table 30: Apgar scoring

APGAR Scoring System				
INDICATOR		0 point	1 point	2 points
A	Activity (Muscle tone)	Absent	Flexed arms and legs	Active
P	Pulse	Absent	Absent 100bpm	Over 100bpm
G	Grimace	Floppy	Minimal response to stimulation	Prompt response to stimulation
A	Appearance	Blue, pale	Pink body, blue extremities	Pink
R	Respiration	Absent	Slow and irregular	Vigorous cry

### 9.4.7 Delayed in cord clamping

Umbilical cord clamping must be delayed for at least 1-3minutes in order to allow transfer of additional amount of blood placenta to the new born. Early umbilical cord clamping (less than 1 min after birth) is not recommended unless the neonate is asphyxiated and need to be moved immediately for resuscitation



### 9.4.8 Clamping of the cord

The umbilical cord should be clamped at 2-3 cm away from the abdomen using an umbilical clamp. Inspect the cord for initial few hours after birth for early detection of oozing from the cord.



### 9.4.9 Cleaning of the baby

The baby should be dried and cleaned at birth with a clean and sterile cloth. The cleaning should be gentle and should only wipe out the blood and the meconium and not be vigorous to remove the vernix caseosa. The vernix protects skin of the infant and helps maintain temperature. This gets absorbed on its own after sometime.



#### 9.4.10 Recording of weight

The baby should be weighed after stabilization and the temperature is documented to be normal. A sterile preheated sheet (or a single use paper towel) should be placed on weighing machine. Zeroing of the machine should be performed. The baby is then gently placed on the weighing machine and the weight recorded.



#### 9.4.11 Initiation of Breastfeeding

Breastfeeding should be initiated within 30 minutes of birth. Time of initiation of the breast feeding should be documented in new born sheet



#### 9.4.12 Vitamin K administration

Vitamin K should be administered to all babies (0.5mg for all babies less than 1000grams and 1 mg for babies more than 1000 grams). This should be administered as an IM injection using the 26G (1/2 inch) needle and a 1 mL syringe on the anterolateral aspect of the thigh.



#### 9.4.13 Rooming in

A normal new born should not be separated from the mother. In the initial few hours of life, the baby is very active, and the closeness of the baby to the mother will facilitate the early breastfeeding and bonding.



#### 9.4.14 Kangaroo Mother Care (KMC)

All babies should receive skin to skin care or Kangaroo Mother Care during first hour of life. KMC should be continued at least for one hour. Babies born premature and need assistance in establishing breathing must be handed over to pediatrician for further management. When stable These babies when stable should be started on KMC.



#### 9.4.15 Care for the cord

Umbilical stump should be kept dry and avoid any application. Diaper should be folded well below the stump to avoid any contamination



#### 9.4.16 Vaccination

Follow national immunization schedule for vaccination of infants



## Care of the newborn at birth

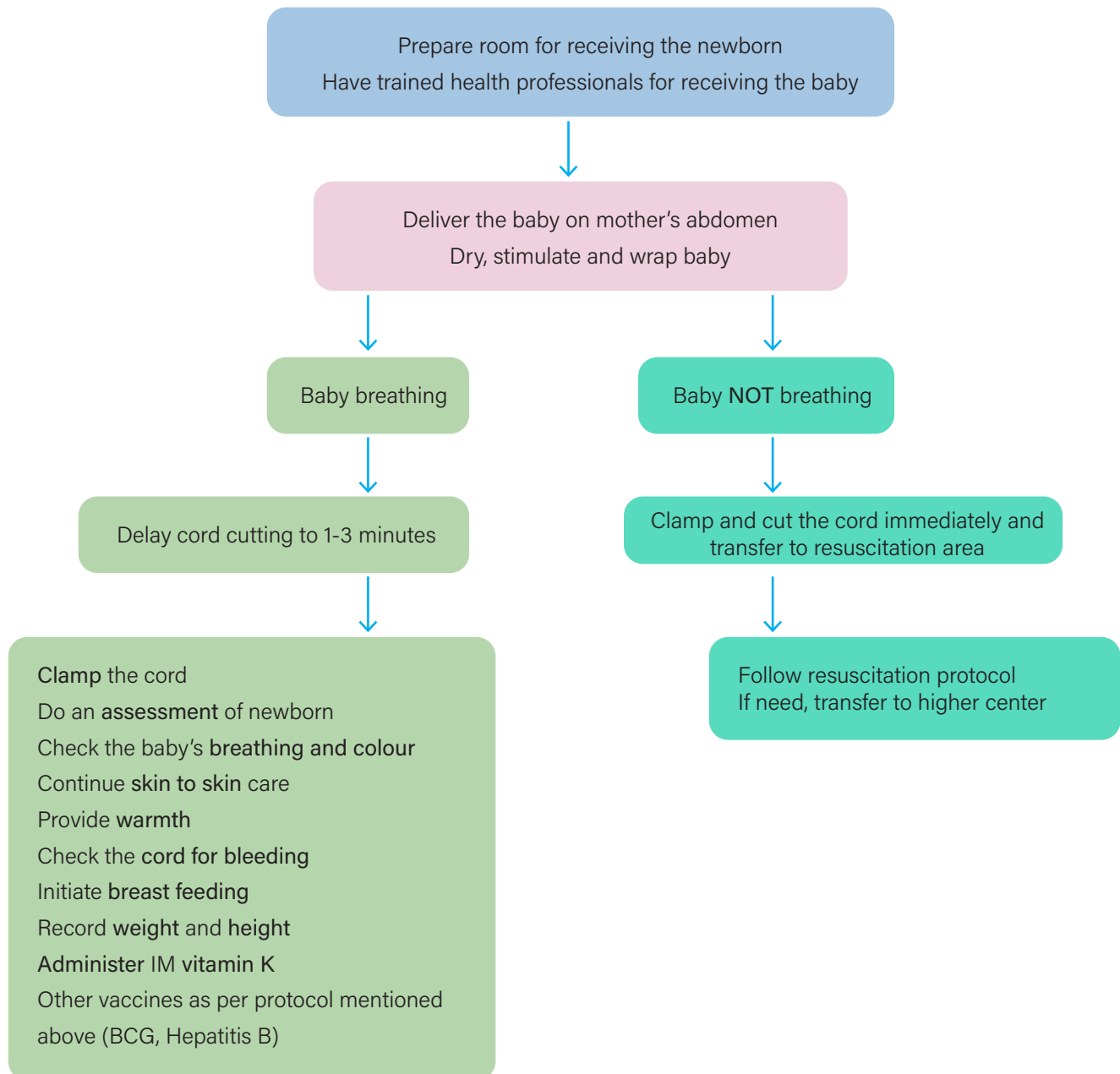


Figure 50: Care of newborn at birth

## 9.5 BIRTH ASPHYXIA IN NEWBORN

Perinatal asphyxia is a common neonatal problem and contribute significantly to neonatal morbidity and mortality.

- » Gasping or ineffective breathing or lack of breathing at one minute of life
- » Need for positive pressure ventilation for > 1 minute
- » Apgar score <3 at 5 minutes or longer

### 9.5.1 Initial stabilization and management

The management consists of supportive care to maintain temperature, perfusion, ventilation and a normal metabolic state including glucose, calcium and acid-base balance.

- » Temperature: Baby should be placed under a radiant warmer. The temperature should be maintained in the normal range of 36.5-37.5 °C.
- » Airway and Breathing: Patent airway should be maintained by appropriate positioning and any secretions should be cleared. The breathing should be monitored and supported as required.
- » Oxygenation: Should be kept in the normal range by monitoring oxygen saturation by pulse oximetry, if facilities exist. SpO<sub>2</sub> should be maintained 90-94%.
- » IV fluids and Enteral Feeding: Initiate IV Fluids as per day's requirement.
- » Blood Glucose: Blood glucose should be monitored for at least first 48 hours. If the baby is hypoglycemic, treat appropriately.
- » Calcium: If a neonate has jitteriness or seizures check serum calcium. Manage hypocalcemia.
- » Vitamin K: 1 mg IM must be administered
- » Blood Pressure: In an asphyxiated neonate cerebral blood flow depends on systemic blood pressure. Hence, maintain systemic mean arterial BP at 40 mm of Hg for term infants. The mean BP for preterm neonates should be maintained equal to gestational age in weeks of mmHg.
- » Seizures

### 9.5.2 Clinical monitoring

All neonates who have suffered asphyxia must be closely monitored clinically as well as by performing certain bedside tests.

- » The neurological status should be monitored by using Hypoxic Ischemic Encephalopathy (HIE) staging Levene's staging every 8 hours which has been found to be useful to detect improvement or further deterioration.
- » The respiratory status must be monitored by meticulous record of the respiratory score (Downe's score) every 2-3 hours.
- » The cardiovascular status assessment should include heart rate, color, CRT, peripheral pulses, pulse oximetry and non-invasive blood pressure (NIBP)
- » The abdominal circumference should be recorded to rule out and ileus due to gut ischemia.
- » The urine output should be measured daily. It should normally be > 1 ml/kg/hr after the first 24 hours of life. If it remains < 1 mL/kg/hr check serum electrolytes, blood urea and s. creatine every 24 hours of life.
- » Blood sugar should be monitored every 6-8 hours during first 24 hours and then as required.

## 9.6 RESUSCITATION OF THE NEWBORN BABY

Spontaneous breathing after birth is not a problem for most babies. However, one in twenty babies might require help with breathing at birth. Hence, resuscitation must be anticipated at each birth.

After birth, the umbilical cord is clamped and cut which stops the delivery of oxygen from the placenta. If the baby does not start breathing immediately after birth, the infant may even die due to lack of oxygen. A proper resuscitation helps the baby to attain normal breathing.

All health professionals who attend the mother at birth must be skilled at resuscitation and know how to recognise babies at risk. They must anticipate and be prepared to know what to do in what order be able to work quickly in coordination to achieve normal breathing

### 9.6.1 Preparation in the delivery room

The delivery room should be ideally:

1. A draught free, warm room with temperature  $>25^{\circ}\text{C}$
2. A clean, dry and warm delivery surface
3. A radiant warmer properly functioning
4. Clean, warm towels/clothes, with cord clamps
5. A folded piece of cloth (Shoulder roll) (1/2 to 1 inch thickness) to position the baby
6. Neonatal resuscitation bag/ self-inflating bag (250-500 ml) with oxygen reservoir
7. Face masks, with different sizes
8. Suction devices & catheters, No. 12FG, 14 FG
9. Oxygen with flow meter and tubing (if available)
10. Oxygen air blender (if available)
11. laryngoscope with functioning lights and with extra batteries
12. ET tubes of size 2.5, 3, 3.5
13. Cannula/ UVC lines for IV access
14. Pulse oximeter (if available)
15. A clock with second hand
16. Stethoscope
17. Medications: Epinephrine, normal saline
18. Identification band
19. cord clamp

### 9.6.2 Important points about the equipment used in resuscitation

- » Equipment must be cleaned and checked after each delivery and checked again before the next delivery to ensure it is ready for use.
- » Equipment must be of the appropriate size. Ambu mask & self-inflating bag
- » The volume of the bag should not be more than 240-500 mL; it should be able to generate a pressure of at least 35 cm of water.
- » Suction should not exceed a negative pressure of 100 mm Hg or 130 cm water

### 9.6.3 If baby is not breathing, start positive pressure ventilation

#### T. Temperature

- » gestation, breathing and tone.
- » Cut the cord, wrap in a pre warm clothe, keep under radiant warmer, dry.
- » Clear any secretion if present, routine suctioning is not recommended.
- » Then stimulate.
- » If no breathing then

#### A. Airway

- » Suctioning: routine suctioning is not recommended. It is done only if there is any obvious obstruction due to secretions. If required the infant is placed correctly (sniffing position) and mouth and nose should be gently suctioned with a bulb syringe or mechanical suction device. Mouth is suctioned first then nares to decrease risk of aspiration. Unnecessary suctioning of esophagus, stomach wash should be avoided if not indicated, as it can produce a vagal response resulting in apnea and / or bradycardia.

Meconium stained amniotic fluid. : in presence of MSAF, routine intrapartum nasopharyngeal suctioning and / or post delivery are NOT recommended.

#### B. Breathing

- » For neonates who are apneic or gasping and/ or heart rate < 100bpm, PPV provided with bag and mask at a rate of 40 to 60 breaths / min.
- » For PPV oxygen concentration is kept at 21% for term infants ( in room air without supplemental oxygen), and 30% for preterm infants.

Start SPO2 monitoring, and titrate oxygen to maintain SPO2 in the given targets in table

Target preductal SpO2 after birth	
1min	60%-65%
2min	65%-70%
3min	70%-75%
4min	75%-80%
5min	80%-85%
10min	85%-95%

### C. Circulation

- » Give chest compressions if the heart rate is  $< 60/\text{min}$  after 30–60 sec of ventilation with adequate chest movements: 90 compressions coordinated with 30 breaths/min (three compressions: one breath every 2 sec). chest compressions are always accompanied by PPV. When ever chest compression is provided, the oxygen concentration should be increased to 100% but it should be weaned rapidly when the heart rate recovers and CPR is no longer needed, to maintain on the target SpO<sub>2</sub> level.
- » Place thumbs just below the line connecting the nipples on the sternum
- » Compress one third the anterior–posterior diameter of the chest
- » Infants who require resuscitation are at risk for deterioration after their vital signs have returned to normal Once adequate ventilation and circulation has been established:
- » Stop ventilation
- » Return to mother for skin-to-skin contact as soon as possible
- » Closely monitor breathing difficulties, signs of asphyxia and anticipate need for further care



*A baby who has been resuscitated with chest compression is better observed in NICU rather than leaving by mother side, at least for a while.*





## TECHNIQUES USED DURING NEONATE RESUSCITATION

Table 31: techniques for neonatal resuscitation

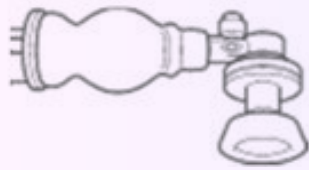
Correct head position to open up airway and for bag ventilation. Do not hyperextend the neck



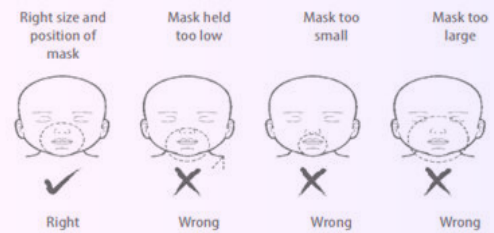
Correct position of hands for cardiac massage of a neonate. The thumbs are used for compression over the sternum



Neonatal self-inflating resuscitation bag with round mask



Fitting mask over face



Correct head position to open up airway and for bag ventilation. Do not hyperextend the neck



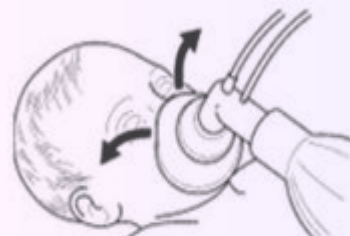
Correct position of hands for cardiac massage of a neonate. The thumbs are used for compression over the sternum



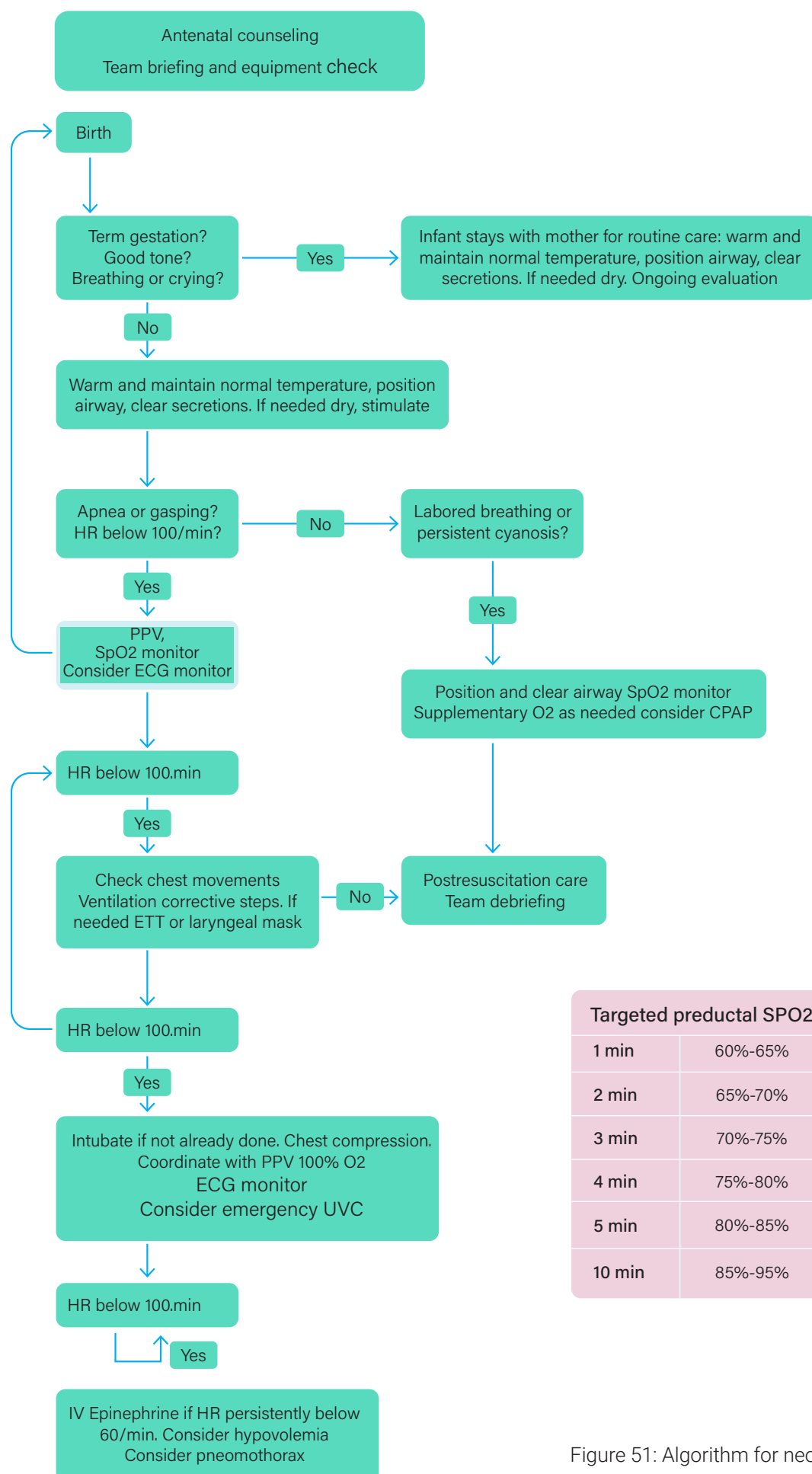
Ventilating a neonate with bag and mask. Pull the jaw forward towards the mask with the third finger of the hand holding the mask. Do not hyperextend the neck



If you hear air escaping from the mask, form a better seal. The commonest leak is between the nose and the cheeks



## 9.6.4 Neonatal Resuscitation Algorithm



### Targeted preductal SPO2 after birth

1 min	60%-65%
2 min	65%-70%
3 min	70%-75%
4 min	75%-80%
5 min	80%-85%
10 min	85%-95%

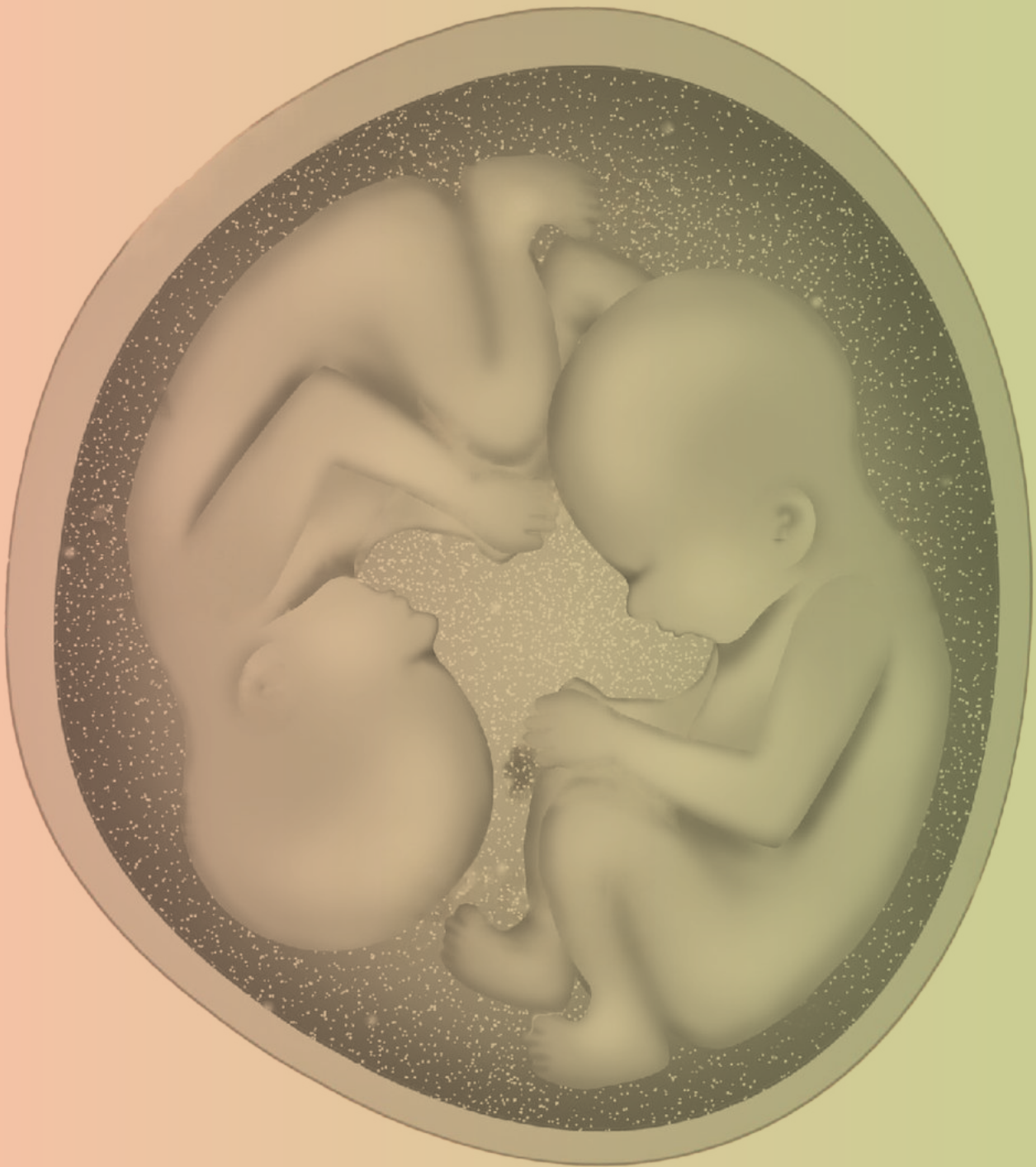
Figure 51: Algorithm for neonatal resuscitation

### 9.6.5 Cessation of resuscitation

- » Resuscitation efforts can be discontinued after 20 minutes of EFFECTIVE resuscitation including intubation and the use of epinephrine.
- » If the neonate has demonstrated no signs of life ( no heart beat or no respiratory effort for more than 20 minutes) we can consider stopping resuscitation.
- » If baby required resuscitation family has to be informed about the ongoing care as soon as possible.
- » Any death of a newborn, (term, preterm or abortion) should be dealt with empathy.
- » Those babies born before the age of viability, viable or not, should be wrapped in clothes and kept under radiant warmer, even though no active intervention would be taken. (Please do not leave them cold in a kidney tray in the basin. If parents wish to hold the fetus, it should be allowed.

# CHAPTER 10

## MULTIPLE PREGNANCY



## 10.1 Multiple pregnancy

When more than one fetus simultaneously develops in the uterus it is called multiple pregnancy. Simultaneous development of two fetuses (twins) is the commonest. Although rare, development of three fetuses (triplets), four fetuses (quadruplets) may also occur. Twin pregnancies are commonly divided according to zygosity, chorionicity and amnionicity as these have important implications for pregnancy and infant outcome.

Table 32: Definitions for multiple pregnancy

Zygosity	Refers to whether the twins arose from one (monozygous) or from two fertilized eggs (dizygous) <sup>1</sup>
Amnionicity	Refers to the number of outer membranes that surround the fetus in a multiple pregnancy and corresponding placentation (i.e. monochorionic or dichorionic);
Monochorionic	refers to the inner membrane layers that do or do not separate the gestational sacs of the twins (see figure 1) (i.e. monoamniotic or diamniotic)
Monochorionic Diamniotic twins (MC/DA)	Monoamniotic twins (MC/MA) Have no separating membrane
Dichorionic Diamniotic twins (DC/DA)	Have a separating membrane consisting of amnion only (two layers)

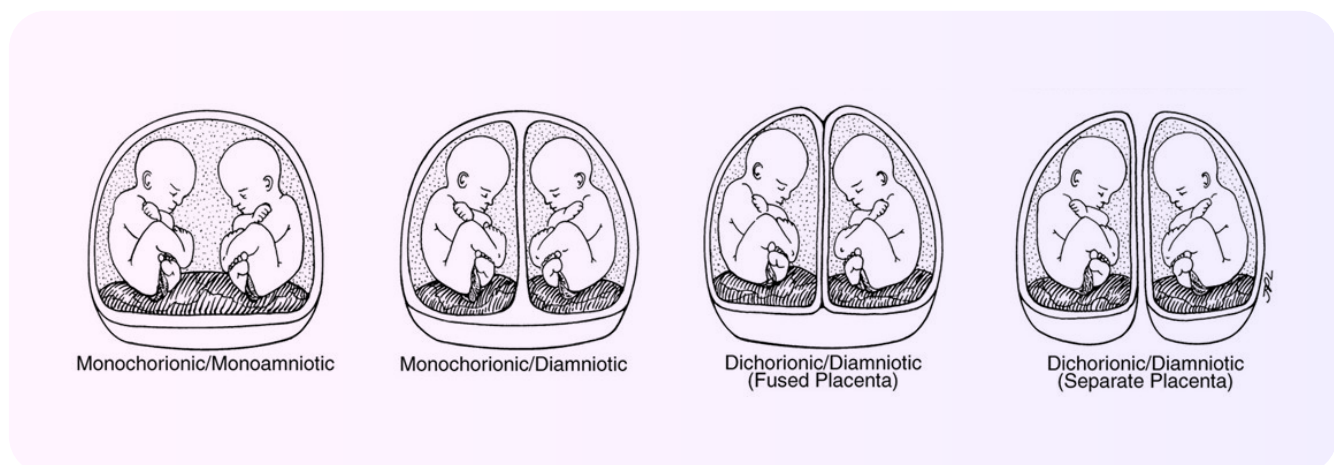


Figure 52: Twin chorionicity

### 10.1.2 Determining chorionicity

All women with a twin pregnancy should have an ultrasound examination between 11+0 weeks and 13+6 weeks of gestation to assess fetal viability, gestational age and chorionicity, and to exclude major congenital malformations.

### 10.1.3 Fetal surveillance

- » Estimate fetal weight discordance using two or more biometric parameters at each ultrasound scan from 20 weeks
- » May need USG every 2 to 3 weeks after 28 weeks of gestation
- » Consider a 25% or greater difference in size between twins or triplets as a clinically important indicator of intrauterine growth restriction and offer referral to tertiary hospital

### 10.1.4 Major challenges

- » Preterm birth
- » Intrauterine growth restriction
- » Increased incidence of medical complications including pre-eclampsia
- » Twin to twin transfusion
- » Antepartum death of one of the twins

### 10.1.5 Complications

- » Miscarriage
- » Anaemia
- » Polyhydramnios
- » Pre-eclampsia
- » Gestational diabetes
- » Congenital anomalies (more common in monozygotic twins)
- » Malpresentations
- » Cord accident (presentation and prolapse)
- » Postpartum haemorrhage

### 10.1.6 Monochorionic twins

There are several complications that can occur almost always with monochorionic twins e.g. Twin-Twin Transfusion Syndrome (TTTS) and selective IUGR (commonly due to unequal placental sharing and velamentous cord insertion).

- » The death of one twin has significant implications in the setting of a monochorionic twin pregnancy where there is a shared placental circulation
- » Ultrasound studies every two weeks from 16–26 weeks are recommended to detect TTTS.

### 10.1.7 Timing and mode of birth

- » Early referral to a higher centre with Neonatal Intensive Care Unit (NICU)
- » The optimal timing of birth is uncertain, with clinical support for both elective delivery at 37 weeks' gestation and for waiting for labour to start spontaneously
- » Monochorionic twin pregnancies: elective birth from 34-36+0, after a course of prophylactic corticosteroids has been offered
- » Dichorionic twin pregnancies: elective birth from 37+0
- » Consider Corticosteroids for lung maturity
- » When appropriate obstetric experience is available, vaginal birth is the preferred mode of birth for all twin pregnancies that meet the following criteria:
  - ◇ Twins must be diamniotic
  - ◇ Twin I is cephalic
  - ◇ Twin II is not > 500g heavier than twin I
  - ◇ Neither twin has any evidence of fetal compromise requiring caesarean section.

### 10.1.8 Death of one twin

- » Death of one twin is not uncommon in twin pregnancy.
- » In monochorionic twin pregnancy, death of one fetus later in pregnancy is associated with a much higher risk of death and subsequent complications for the other fetus. Death after 20 weeks of gestation may carry a risk of death or damage for the remaining fetus.
- » At the time of birth, identify any remains of 2nd twin and sent to histopathology, if available

### 10.1.9 Fetal surveillance of monochorionic twins

Ultrasound examination in monochorionic twins should include growth, amniotic fluid volume in each sac, bladder volume, umbilical artery and, preferably, middle cerebral artery Doppler wave forms (after 24 weeks)

- » Fetal hydrops carries poor prognosis
- » Clinical suspicion is raised antenatally when monochorionic twins show disparity in fetal size.

### 10.1.10 Clinical suspicion is raised when there is:

- » Early discordance in fetal size and or nuchal translucency measurement
- » Discordance in fetal growth / size
- » Rapid increase in maternal abdominal girth representing rapid accumulation of polyhydramnios

### 10.1.11 Indications for cesarean section for second twin

- » Larger second twin with non-cephalic presentation
- » Prompt closure of the cervix after delivery of the first baby
- » Fetal distress of second twin

### 10.1.12 Elective caesarean section

- » Twin pregnancies with breech presentation of twin I or other major obstetric risk factors may require elective caesarean section at 38 weeks gestation
- » Breech presentation of the second twin is not a contraindication to vaginal birth

### 10.1.13 Management of twin labour

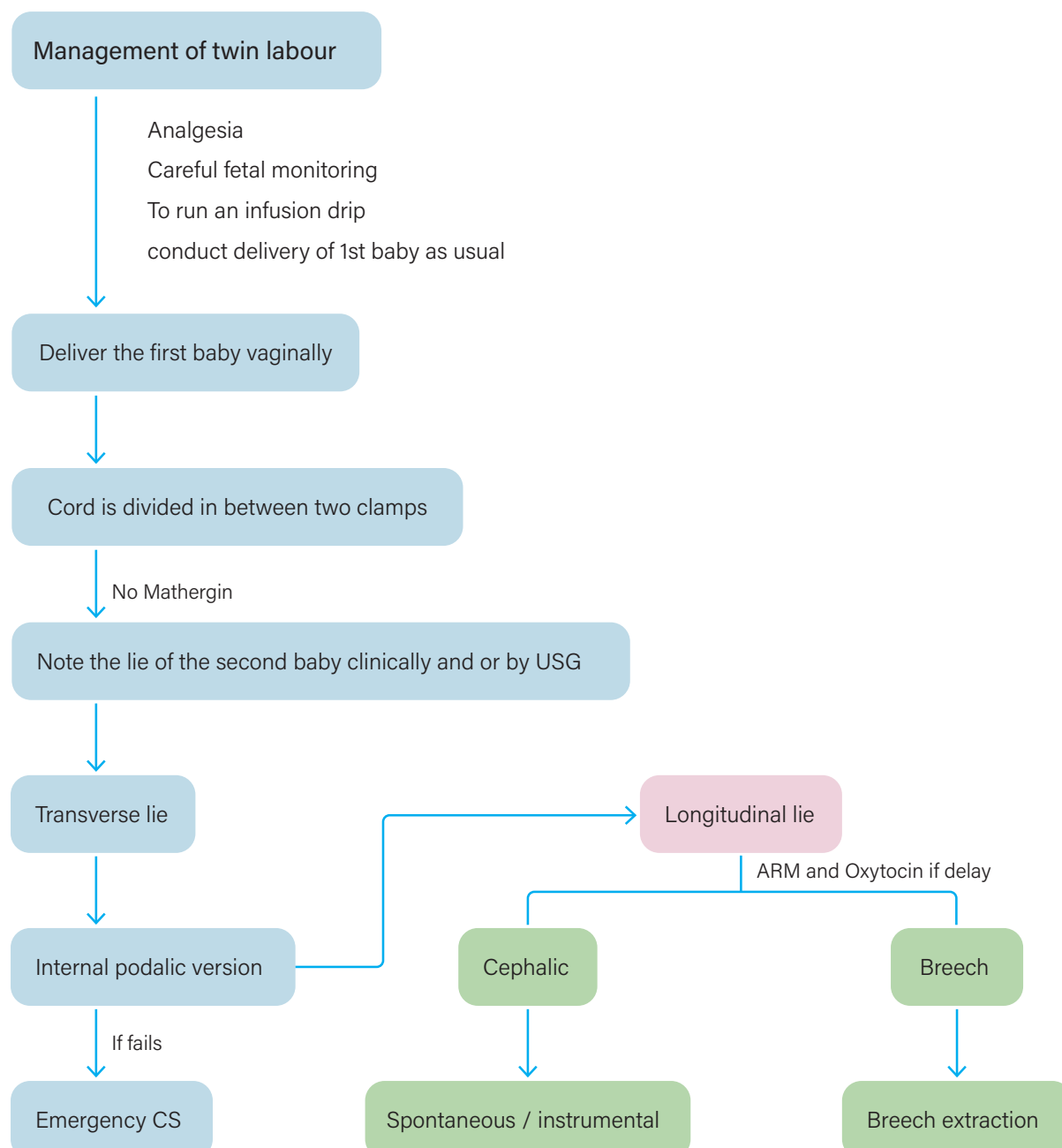


Figure 53: Management of twin labour

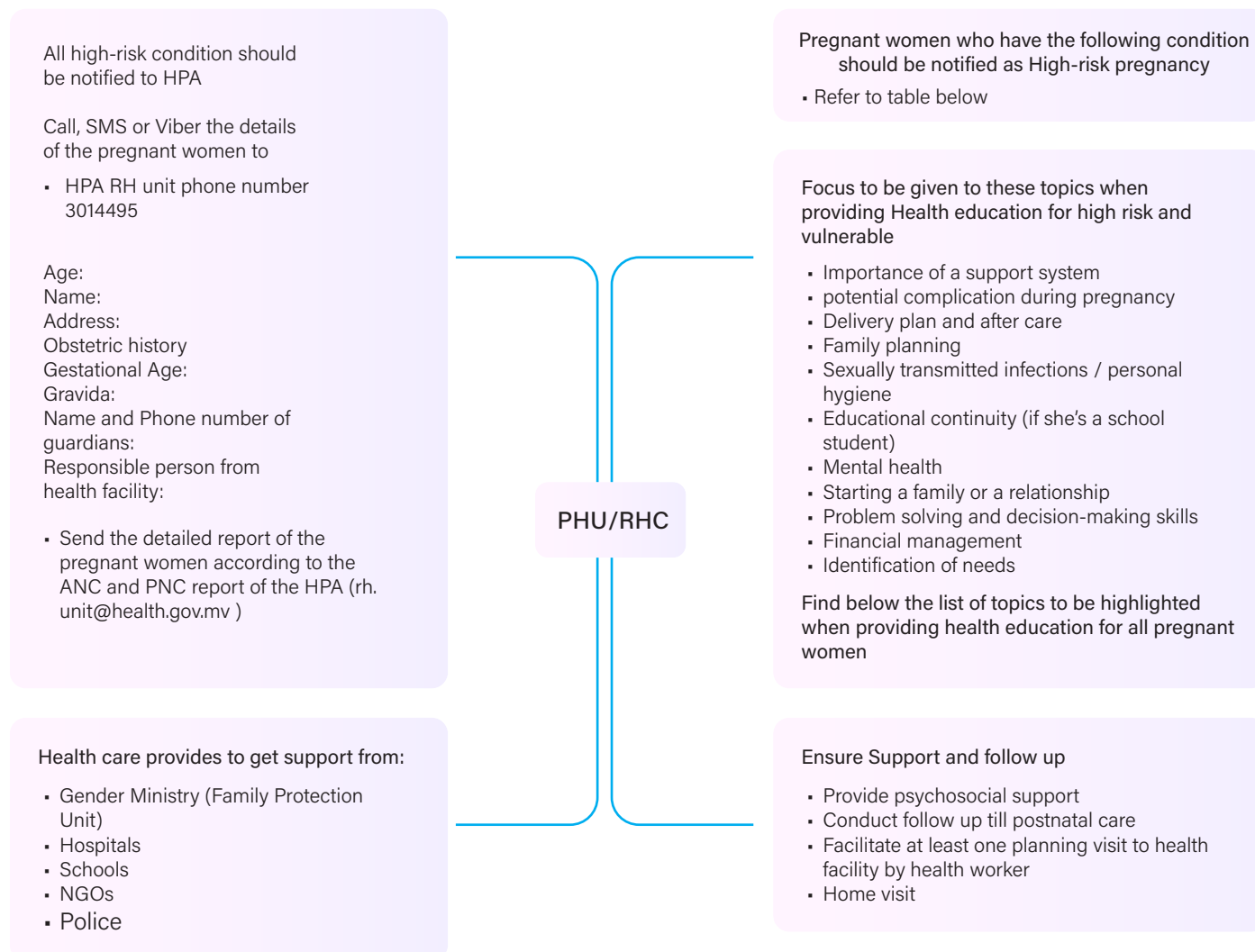


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## Role of Reproductive health Center when a high risk is confirmed



High Risk Category:	
Age < 19 years or >40years	
Age > 40 years at first pregnancy	
Grand Multipara >5	
Short stature <145cm	
Previous Caesareans/uterine scars	-Previous Caesareans: 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> -Myomectomy <input type="checkbox"/> Cavity breached, Yes <input type="checkbox"/> No <input type="checkbox"/> Documents not available <input type="checkbox"/>
Bad Obstetric historyscars	Previous neonatal demise or stillbirths History of Recurrent Abortions (equal to or more than 3) Preterm deliveries Fetal anomalies
Twin / Multiple Pregnancy	
Rh negative	
obesity	BMI > 30kg/m2
Anemia	IDA Others(specify):
Diabetes	Gestational: Pregestational:
Hypertension:	Gestational: Preeclampsia: Chronic:
Thyroid	Hypothyroidism Hyperthyroidism Others(specify):
Seizure disorders	
Cardiovascular diseases	CHD: Others (specify):
Autoimmune Diseases	
STIs / Genital warts	
Group B Streptococcus	
Substance Use Disorder (SUD)	
Mental health disorde	
Rape victim	
victim of Gender based violence	
women who engage in Sex work	
multiple sexual partners	
Adolescents whose parents are involved in criminal activities	

## Topics to be highlighted when providing Health education for all pregnant women

1. Importance of ANC visit (how many visits, what it includes)
2. Balance diet (from Maternal child Nutrition (MCN) guide provided by HPA)
3. Medicines used in pregnancy
4. Anaemia
5. Pregnancy and weight
6. Exercise during pregnancy
7. potential complications during pregnancy
8. Information related to delivery (Importance of early preparation for delivery, information about delivery room and delivery types)
9. Breast feeding
  - ◇ Exclusive breast feeding
  - ◇ Breast Milk substitutes (according to Doctors advice, if not able to breast feed the child) refer to BMS code
10. Information about the delivery and Postnatal changes to body
11. Being parents to the newborn
12. Postnatal exercise/ postnatal care
13. Vaccination
14. Umbilical Cord Care
15. Common newborn conditions
16. Newborn sleeping positions and patterns
17. Pregnancy and contraceptives
18. Sexually transmitted infection / personal hygiene
19. Importance of a support system
20. Important topics to be focused when providing psychosocial support for (Teenage/ Adolescent pregnancy (under 20 years),
  - ◇ Educational continuity (if she's a school student)
  - ◇ Starting a family or relationship
  - ◇ Problem solving and decision-making skills
  - ◇ Financial management
  - ◇ Managing emotions
  - ◇ Identification of needs

# Appendices

- » **Appendix 1**  
Antenatal And Postnatal Record Form
- » **Appendix 2**  
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- » **Appendix 3**  
Magnesium Sulphate Administration And Monitoring Chart
- » **Appendix 4**  
Blood Sugar Profile In Gestational Diabetes / Pregestational Diabetes
- » **Appendix 5**  
Kick Count Chart
- » **Appendix 6**  
Neonatal Death Reporting Form
- » **Appendix 7**  
Labour Care Guide
- » **Appendix 8**  
Maternal Deth reporting form
- » **Appendix 9**  
Shoulder dystocia reporting form
- » **Appendix 10**  
Shoulder dystocia documentation form

## Appendix 1

### Antenatal and postnatal record form



بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ  
REPRODUCTIVE HEALTH UNIT

Health protection Agency

Ministry of Health



## ANTENATAL RECORD-CLIENT CARD

NAME:

NIC NO:

AGE:

NCHSS/COHORT NO:

RESIDENTIAL ADDRESS:

TEL NO:

COMPLICATED: YES/NO

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දිවයිනේ ප්‍රතිරෝධීතාවයේ ප්‍රධාන කරුණු සහතික කිරීමේදී ප්‍රධාන වශයෙන් සලකා බැලිය යුතු කරුණු වන්නේ, ප්‍රතිරෝධීතාවයේ ප්‍රධාන කරුණු වේ.

### DELIVERY PLAN/ප්‍රතිරෝධීතාවයේ ප්‍රධාන කරුණු

දිවයිනේ ප්‍රතිරෝධීතාවයේ ප්‍රධාන කරුණු සහතික කිරීමේදී ප්‍රධාන වශයෙන් සලකා බැලිය යුතු කරුණු

ප්‍රතිරෝධීතාවයේ ප්‍රධාන කරුණු	ප්‍රතිරෝධීතාවයේ ප්‍රධාන කරුණු
ප්‍රතිරෝධීතාවයේ ප්‍රධාන කරුණු (1) වරින්	දිවයිනේ ප්‍රතිරෝධීතාවයේ ප්‍රධාන කරුණු (3) වරින්
ප්‍රතිරෝධීතාවයේ ප්‍රධාන කරුණු (2) වරින්	දිවයිනේ ප්‍රතිරෝධීතාවයේ ප්‍රධාන කරුණු (2) වරින්
ප්‍රතිරෝධීතාවයේ ප්‍රධාන කරුණු (3) වරින්	දිවයිනේ ප්‍රතිරෝධීතාවයේ ප්‍රධාන කරුණු (6) වරින්

COMPLETE THIS FOR EVERY PREGNANT WOMAN UPON REGISTRATION IN A HEALTH FACILITY-ALL HEALTH FACILITIES AND PRIVATE CLINICS SHOULD COMPLETE THIS FORM

දිවයිනේ ප්‍රතිරෝධීතාවයේ ප්‍රධාන කරුණු සහතික කිරීමේදී ප්‍රධාන වශයෙන් සලකා බැලිය යුතු කරුණු වන්නේ, ප්‍රතිරෝධීතාවයේ ප්‍රධාන කරුණු වේ.





NIC No:  
Name:  
Age:  
Address:  
Contact No:

P L A  
Type of Delivery:  
Indication:

NCHSS / COHORT No: \_\_\_\_\_  
Date of Delivery: \_\_\_\_\_  
Birth Weight: \_\_\_\_\_  
Sex: \_\_\_\_\_


### POST - NATAL RECORD

	1st VISIT	2nd VISIT	3rd VISIT
Date:			
Complaints			
Anaemia			
B.P			
P/A: ut			
Suture line			
Episiotomy			
P/V bleeding			
Breast Examination			
F.P Advice			
Next Visit			
Remarks			

[illegible]

## Appendix 2

### Communicable Disease Notifying Form

 <b>Communicable Disease Notifying Form</b> Health Protection Agency Male', Republic of Maldives		V8 - Oct - 2019
<b>Reporting Facility</b>		<input type="checkbox"/> <b>*Re-notification</b> (required for changes in diagnosis (e.g. Dengue Fever to DHF), case confirmation or outcome (e.g. death).
<b>Notifiable Diseases</b> (place ✓ appropriately)		
<b>Immediately notifiable via form and Telephone</b> (+960 3014496/contact HPA surveillance focal point)	<b>Notifiable within 24 hrs. to HPA via email</b> ( <a href="mailto:surveillancereportshpa@gmail.com">surveillancereportshpa@gmail.com</a> ) or fax (+9603014484)	
<input type="checkbox"/> AEFI <input type="checkbox"/> Acute Flaccid Paralysis (use Polio investigation form) <input type="checkbox"/> Cholera <input type="checkbox"/> Diphtheria <input type="checkbox"/> Encephalitis (specify organism if known) <input type="checkbox"/> Food Poisoning (use investigation form) <input type="checkbox"/> Measles (complete measles investigation form) <input type="checkbox"/> Meningitis (specify organism if known) <input type="checkbox"/> Mumps <input type="checkbox"/> MERS (Middle East Respiratory Syndrome) <input type="checkbox"/> Pertussis/whooping cough (use investigation form) <input type="checkbox"/> Rabies <input type="checkbox"/> Rubella/Congenital Rubella Syndrome (use investigation form) <input type="checkbox"/> Shigella <input type="checkbox"/> Tetanus / £ Neonatal tetanus <input type="checkbox"/> Tuberculosis (use TB investigation form) <input type="checkbox"/> Yellow Fever	<input type="checkbox"/> Chikungunya £ Zika (complete investigation form) <input type="checkbox"/> DF/£DHF/£DSS <input type="checkbox"/> GBS (Guillain-Barré syndrome) <input type="checkbox"/> Hepatitis A / B/ C/ D/E (circle as appropriate) <input type="checkbox"/> Lymphatic Filariasis <input type="checkbox"/> Leprosy <input type="checkbox"/> Leptospirosis <input type="checkbox"/> Malaria <input type="checkbox"/> Plague <input type="checkbox"/> Pyrexia of unknown origin (PUO) Pneumonia with cause <input type="checkbox"/> Rota virus (complete Rota virus lab surveillance form) <input type="checkbox"/> Scrub Typhus <input type="checkbox"/> SARI (Severe Acute Respiratory Infection = ARI requiring hospital admission) <input type="checkbox"/> Scabies <input type="checkbox"/> STIs – Gonorrhea/Chlamydia/Genital warts/Genital Herpes (Circle as appropriate) <input type="checkbox"/> Syphilis / <input type="checkbox"/> Congenital Syphilis <input type="checkbox"/> Typhoid/ <input type="checkbox"/> Paratyphoid (complete case investigation form) <input type="checkbox"/> Toxoplasmosis/ <input type="checkbox"/> Congenital toxoplasmosis <input type="checkbox"/> Others (specify) _____	
<b>Case Details (Mandatory fields are marked with (*) and underlined. Please make sure to complete them.)</b>		
<b>1- *Case classification:</b> Suspect <input type="checkbox"/> Probable <input type="checkbox"/> Confirmed <input type="checkbox"/> (as per surveillance case definition)		
<b>2- *Patient National ID No:</b> A _____ For foreigners include passport number	<b>3- *Patient Name:</b> _____	<b>4- *Age:</b> YY / MM <b>5- *Sex:</b> <input type="checkbox"/> M <input type="checkbox"/> F If pregnant <input type="checkbox"/>
<b>6- *Patient's residential Address with Atoll/Island</b> (Usual address of residence)	<b>7- * Patient's permanent Address with Atoll/Island</b>	<b>8-Contact number</b>
<b>9-Nationality</b> country of origin		
<b>10- *Date of onset of illness:</b> DD / MM / YYYY		<b>11-Date of consultation:</b> DD / MM / YYYY
<b>12- *Patient category</b> <input type="checkbox"/> Out-patient <input type="checkbox"/> In-patient: <input type="checkbox"/> Ward _____ Bed _____ <input type="checkbox"/> ICU _____ Bed _____		<b>13- *Case outcome:</b> <input type="checkbox"/> Death <input type="checkbox"/> On treatment <input type="checkbox"/> Referred to higher center <input type="checkbox"/> Recovered with disability <input type="checkbox"/> Recovered fully <b>*If on treatment, specify what is being given</b>
<b>14- Recent travel history</b> (include countries/islands visited)		
<b>15- Dates of travel</b> DD / MM / YYYY		
<b>16-Clinical details</b> (include risk factors, mode of transmission, etc.)		<b>17-Laboratory Confirmation:</b> <input type="checkbox"/> Confirmed: Test specifics _____ <input type="checkbox"/> If Requested, Date: DD / MM / YYYY <input type="checkbox"/> Not Requested
<b>18- Condition of patient:</b> <input type="checkbox"/> Stable <input type="checkbox"/> Sick <input type="checkbox"/> Critically ill		
<b>Notifier details</b> (e.g.: Dr, Nurse, HW or another designated person) Name: _____ Designation: _____ Contact number: _____ Signature: _____ Date: DD / MM / YYYY		<b>Data entry use</b> (use by PHUs and entry users) Date received: DD / MM / YYYY Date of entry: DD / MM / YYYY Checked and entered by: _____

## Appendix 3

### MAGNESIUM SULPHATE ADMINISTRATION AND MONITORING CHART

Name: \_\_\_\_\_ Dat \_\_\_\_\_

Midwife: \_\_\_\_\_ ID no. /Hospital no: \_\_\_\_\_

Hour	Time	MagSO4 dose and route	REFLEX- ES PRES- ENT YES/ NO (circle one) If absent DO NOT GIVE MgSO4	BP	RR If <16/min DO NOT GIVE MgSO4	SPO2	Patellar reflex	URINE OUTPUT If <30ml/ hr DO NOT GIVE MgSO4	CONVUL- SIONS YES/NO (circle one)	OTHER DRUGS Given	Sign
Initial BP ____/____		Initial Urine protein ____									
0		Yes No							Yes No		
1		Yes No							Yes No		
2		Yes No							Yes No		
3		Yes No							Yes No		
4		Yes No							Yes No		
5		Yes No							Yes No		
6		Yes No							Yes No		
7		Yes No							Yes No		
8		Yes No							Yes No		
9		Yes No							Yes No		
10		Yes No							Yes No		
11		Yes No							Yes No		
12		Yes No							Yes No		
13		Yes No							Yes No		
14		Yes No							Yes No		
15		Yes No							Yes No		
16		Yes No							Yes No		
17		Yes No							Yes No		
18		Yes No							Yes No		
19		Yes No							Yes No		
20		Yes No							Yes No		
21		Yes No							Yes No		
22		Yes No							Yes No		
23		Yes No							Yes No		
24		Yes No							Yes No		

## Appendix 4

### Blood Sugar Profile in Gestational Diabetes / Pregestational Diabetes

Pre meal – 95 mg/dl ( $\leq 5.3$ mmol/l)

1Hour post meal - 140 mg/dl ( $\leq 7.8$ mmol/l)

2Hour post meal - 120 mg/dl ( $\leq 6.7$ mmol/l)

[illegible]

## Appendix 5

### kick count chart

### Fetal Kick Count Chart (FKCC):

1. When you want to check baby movements, after a meal or a snack, lie on your left-hand side and Tick (✓) in the box when you feel your baby move.
2. You can record the time after 10 kicks every day
3. Daily after 10 fetal movements are perceived, the next sense of fetal movement is no longer required to be marked for that day.
4. If 10 movements of baby are not felt in 12 hours' time, go to the nearest health facility immediately.

[illegible]

Appendix 6  
Neonatal death reporting form

**CONFIDENTIAL**

**Hospital / Health Centre  
Perinatal and Neonatal Death Reporting Form**



**Ministry of Health and Family  
Maldives  
2010**

The information contained in this form is ONLY for the use of MPMMRC and is SOLELY intended to be used to prevent maternal and perinatal deaths and to improve the services related to maternal and neonatal care

last updated on 07th March 2010

### INSTRUCTIONS FOR USERS

This form must be completed for any perinatal and neonatal death that occurs in a hospital or a health centre. This form also must be filled with all available and applicable information on neonatal deaths that are brought dead.

<b>Perinatal death</b>	- deaths that occur as a still birth or in the early neonatal period (<7 days of age)
<b>Neonatal death</b>	- death of a child up to and including 28 days of age

Health Centres may not complete the sections shaded grey.  
All tertiary level hospitals have to complete all sections in the form

**NB:** Please refer the information at the back when completing the questions which require additional information.

### 1. FACILITY DETAILS

Name of hospital / health centre	Atoll	Island
<input type="text"/>	<input type="text"/>	<input type="text"/>

### 2. Mother's Details

Name	<input type="text"/>	Hospital /HC No.	<input type="text"/>	Please fill as applicable  Even if mother is not admitted get the ANC information
Address	<input type="text"/>	Admission No.	<input type="text"/>	
Age	<input type="text"/> <input type="text"/>	Date of birth	<input type="text"/>	
		ANC Registration No (Hospital / HC)	<input type="text"/>	
		Registration No. (island)	<input type="text"/>	

### 3. BABY'S DETAILS

Name (if given)

Type of Death  $\rightarrow$  Still Brth ☐ Neonatal Death ☐

Hospital/HC No.	Admission No.	Gestational age at birth (weeks)	<input type="text"/> <input type="text"/>
<input type="text"/>	<input type="text"/>	Birth weight (grams)	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
Date of birth	<input type="text"/> <input type="text"/> <input type="text"/>	Sex $\rightarrow$ Male <input type="checkbox"/> Female <input type="checkbox"/> Ambiguous <input type="checkbox"/>	
Time of birth	<input type="text"/> (am/pm)		
Date of death	<input type="text"/> <input type="text"/> <input type="text"/>		
Time of death	<input type="text"/> (am/pm)		

If multiple pregnancy  $\rightarrow$  Number of babies born

#### 4. OBSTETRIC HISTORY

##### 4.1 Previous Obstetric History

Gravida  Parity

Number of previous still births/ abortions

Number of sibling deaths if any

Sibling illnesses if known  Describe:

Total TT immunization doses received (if known)

##### 4.2 Obstetric History- Present Birth

###### 4.2.1 Antenatal

Total no. of ANC Visits/ Checkups  No. of TT immunization doses

Was there bleeding during pregnancy? Yes ☐ No ☐

If 'Yes' what was the cause of bleeding (Tick as applicable)

☐ Threatened abortion ☐ Placental abruption ☐ Placenta previa  
☐ Vasa previa ☐ Trauma ☐ Undetermined

Was hypertension present? Yes ☐ No ☐

If 'Yes' (Tick as applicable)

☐ Essential hypertension ☐ Chronic+Superimposed pre-eclampsia  
☐ Pre-Eclampsia ☐ Eclampsia  
☐ Other hypertension  Specify:

Was diabetes present? Yes ☐ No ☐

If 'Yes' (Tick as applicable) → Gestational diabetes ☐ Other diabetes ☐

If 'gestational diabetes'

Details of medication:

Was any other maternal medical/ surgical problem present? Yes ☐ No ☐

If 'Yes' (Tick as applicable)

Hypothyroidism ☐ Hyperthyroidism ☐

Infection ☐ Specify:

Malignancy ☐ Specify:

Heart disease ☐ Specify:

Injury ☐ Specify:

Major abdominal surgery ☐ Specify:

Any others ☐ List:

1.  
2.  
3.

#### 5. LABOUR, DELIVERY & POSTNATAL DETAILS

##### 5.1 Details on birth labour and delivery

Was the death an unexplained intrauterine death? Yes ☐ No ☐

When did the death occur?

☐ Before onset of labour  
☐ During labour  
☐ Before birth (unknown time)  
☐ After birth



Was there rupture of membranes more than 12 hours prior to onset of labour? Yes ☐ No ☐ Unknown ☐

Were there cord complications? Yes ☐ No ☐

If 'Yes' describe

Was chorioamnionitis present? Yes ☐ No ☐ Unknown ☐

If 'Yes' diagnosis was:

Pathological ☐ Clinical ☐

If pathological:

☐ Group B Streptococcus

☐ Other bacterial

☐ Other Specify:

Level of hospital/health centre care received (Tick as applicable):

[Please indicate all places where care was received, where initial care was given and where referred to]

Initial care

- ☐ Tertiary hospital  
☐ Private hospital  
☐ Regional hospital  
☐ Atoll hospital  
☐ Health centre  
☐ Health post  
☐ Home  
☐ Other

Specify:

Subsequent care

- ☐ Tertiary hospital  
☐ Private hospital  
☐ Regional hospital  
☐ Atoll hospital  
☐ Health centre  
☐ Health post  
☐ Home  
☐ Other

Specify:

Referral

- ☐ Tertiary hospital  
☐ Private hospital  
☐ Regional hospital  
☐ Atoll hospital  
☐ Health centre  
☐ Health post  
☐ Home  
☐ Other

Specify:

Onset of labour

☐ Spontaneous ☐ Induced ☐ No labour

Mode of delivery

- ☐ Spontaneous vaginal ☐ Breech extraction ☐ Assisted vaginal  
☐ Instrumental ☐ Caesarean Section  
☐ Forceps ☐ Emergency  
☐ Vacuum ☐ Elective

Presentation → ☐ Vertex ☐ Breech ☐ Cord ☐ Others

Specify:

Was there (tick as applicable) ☐ Oligohydramnios

☐ Polyhydramnios

☐ Others

Specify:

Who conducted the delivery?

- ☐ Nurse  
☐ Nurse midwife  
☐ Medical officer  
☐ Obstetrician  
☐ TBA(Foolhuma)  
☐ CHW/FHW  
☐ Other

Specify:

## 5.2 Postnatal details

**Apgar Scores**  
(See instruction)

1 min	5 min	10 min
<input type="text"/>	<input type="text"/>	<input type="text"/>

Was the liquor meconium stained? Yes ☐ No ☐

If 'Yes' was the baby → Vigorous ☐ Floppy ☐

Was cord blood gas done? Yes ☐ No ☐

If 'Yes' was the baby

pH \_\_\_\_\_ pCO<sub>2</sub> \_\_\_\_\_ pO<sub>2</sub> \_\_\_\_\_ Base Excess \_\_\_\_\_ Bicarbonate \_\_\_\_\_

Was neonatal resuscitation required? Yes ☐ No ☐

Was neonatal resuscitation done in the labour room? Yes ☐ No ☐

If 'Yes' specify (tick as applicable)

	<u>Duration</u>		<u>Meconium aspirated?</u>
<input type="checkbox"/> Endotracheal tube suction	_____ Min.	→	Yes <input type="checkbox"/> No <input type="checkbox"/>
<input type="checkbox"/> Bag and mask ventilation	_____ Min.		
<input type="checkbox"/> Bag and tube ventilation	_____ Min.		
<input type="checkbox"/> External cardiac massage	_____ Min.		

**Resuscitation medications (tick as applicable)**

Dose given

<input type="checkbox"/> Epinephrine	_____
<input type="checkbox"/> Normal saline	_____
<input type="checkbox"/> Naloxone	_____
<input type="checkbox"/> Sodium bicarbonate	_____
<input type="checkbox"/> Others	Specify: _____

**Was assisted ventilation (apart from resuscitation) required?**

If 'Yes' → **Type of assisted ventilation** (apart from resuscitation)

☐ CPAP ☐ PPV ☐ Other

Specify: \_\_\_\_\_

Was any procedure performed? Yes ☐ No ☐

**Procedures performed if any**

**Reason**

<input type="checkbox"/> Partial exchange transfusion	_____
<input type="checkbox"/> Total blood exchange transfusion	_____
<input type="checkbox"/> Intercostal drainage	_____
<input type="checkbox"/> Aspiration	_____
<input type="checkbox"/> Central venous / arterial line insertion	_____
<input type="checkbox"/> Others (specify)	_____

Was any surgery performed? Yes ☐ No ☐

If 'Yes':

Specify: \_\_\_\_\_

**Nutrition/feeding during hospital stay**

☐ Breastfeeding  
☐ Tube feeding  
☐ Spoon/ cup feeding  
☐ Parenteral

## 6. DETAILS OF BABY

### Maturity:

- ☐ **Preterm** [gestational age <37 weeks] →
- ☐ **Term** [gestational age >37 weeks but <42 weeks]
- ☐ **Post term** [gestational age >42 weeks]

Most likely cause of pre-maturity:

### Significant anthropometric measurements:

Head circumference \_\_\_\_\_ cm

Crown heel length \_\_\_\_\_ cm

Others Specify:

### Was there intra uterine growth restriction (IUGR)?

(Birth weight less than 10<sup>th</sup> percentile)

See growth percentile chart in reference information

Yes ☐ No ☐

If 'Yes' (tick as applicable):

- ☐ Symmetric (formula)
- ☐ Asymmetric (formula)

### Most probable cause of IUGR

- ☐ Idiopathic
- ☐ Placental pathology
- ☐ Intrauterine infections
- ☐ Nutritional
- ☐ Maternal medical problems →
- ☐ Others

Specify:

Specify:

### Disorders of size

(Refer growth percentile charts)

- ☐ SGA (Small for gestational age- <10<sup>th</sup> percentile)
- ☐ LGA (Large for gestational age - > 90<sup>th</sup> percentile)

### Specify

### Birth/ genetic defects if any (See instructions)

- ☐ Cardiac
- ☐ Cranio-facial
- ☐ Chromosomal anomaly
- ☐ Gastro-intestinal
- ☐ Genital/Urinary
- ☐ Muscular skeletal
- ☐ Other defect

### Any birth injuries present

Yes ☐ No ☐

If 'Yes' (tick as applicable):

Fractures

☐

Specify:

Brachial plexus injury [Erb's/ Klumpke's]

☐

Lacerations

☐

Facial nerve injury

☐

Other

☐

Specify:

### Placenta examined?

Yes ☐ No ☐

Give details if any abnormality:

## 7. DETAILS ON NEONATAL DEATHS

### 7.1 Condition at admission (reporting health facility)

Brought dead Yes ☐ No ☐

If 'Yes' was there any indication of abuse?

If 'Yes' describe

Vitals (Record) → RR \_\_\_\_\_ HR \_\_\_\_\_ BP \_\_\_\_\_ Temp. \_\_\_\_\_  
SpO<sub>2</sub> \_\_\_\_\_

Was brought with O<sub>2</sub>? Yes ☐ No ☐

Was assisted ventilation required during transportation? Yes ☐ No ☐

If 'Yes' ☐ Bag and mask ☐ Bag and tube

No. of hours of assisted ventilation \_\_\_\_\_ hrs

### 7.2 Condition during admission (reporting health facility)

Was there any morbidity during admission? Yes ☐ No ☐

If 'Yes' (tick and specify as applicable):

Specify

Morbidity conditions if any (Refer instructions)	<input type="checkbox"/>	Respiratory	_____
	<input type="checkbox"/>	Cardiovascular	_____
	<input type="checkbox"/>	CNS	_____
	<input type="checkbox"/>	Haematological	_____
	<input type="checkbox"/>	GIT	_____
	<input type="checkbox"/>	Infections	_____
	<input type="checkbox"/>	Metabolic/ Endocrine	_____
	<input type="checkbox"/>	Eyes	_____
	<input type="checkbox"/>	Other(s)	_____

Was surfactant given? Yes ☐ No ☐

If 'Yes' (tick as applicable) at: ☐ Delivery room  
☐ Nursery/NICU

Who was the primary neonatal care provider?

- ☐ Nurse
- ☐ Nurse midwife
- ☐ Medical officer
- ☐ Paediatrician
- ☐ Neonatologist
- ☐ Obstetrician
- ☐ Anaesthesiologist
- ☐ TBA(Foolhuma)
- ☐ CHW/FHW
- ☐ Other

Specify:

Maternal medications given:  
(List all – see instruction)

Anaesthesia given: Yes ☐ No ☐

If 'Yes' specify:

## 8. CAUSE OF DEATH

### 8.1 Complete diagnosis at admission

### 8.2 Complete diagnosis at death

### 8.3 Obstetric cause of death (If still born/ IUD)

## 9. SIGNIFICANT FAMILY/ SOCIAL HISTORY OF MOTHER

### Level of education (mother)

- ☐ Basic education (asaasee thauleem)  
☐ Primary education (grades 1-7)  
☐ Secondary education (grades 8-10)  
☐ Higher secondary education (grades 11-12)  
☐ Diploma /Degree & above

### Marital status (mother)

- ☐ Married  
☐ Divorced  
☐ Single

### Employment (mother)

- ☐ Employed  
☐ Not employed

### History of tobacco use /substance abuse in mother

Yes ☐ No ☐

If 'Yes' (tick as applicable):

- ☐ Smoking  
☐ Drug abuse

## 10. IN YOUR OPINION DID ANY OF THE FOLLOWING FACTORS CONTRIBUTE TO THE DEATH OF THIS PATIENT?

System	Example	Y	N	?	Specify
Personal/Family	Delay in woman seeking help				
	Declined treatment or admission				
	Other; specify				
Logistical systems	Lack of transport from home to health care facility				
	Lack of transport between health care facilities				
	Health service - Health service communication breakdown				
Facilities	Lack of facilities, equipment or consumables (drugs, infusion sets, blood, fluids etc.)				
Health personnel problems	Lack of human resources				
	Lack of expertise, training or education				
	Delays in Referral				
	Delays in appropriate action				

Comments on potential avoidable factors, missed opportunities and substandard care

Please note that substandard care includes inadequate monitoring as well as substandard management.

## 11. WHAT HAS YOUR INSTITUTION LEARNT FROM THIS CASE AND WHAT ACTIONS DO YOU ENVISAGE FROM THIS LEARNING PROCESS? (If applicable)

## 12. ANY OTHER RELEVANT/SIGNAFICANT INFORMATION REGARDING DEATH

State here:

Form completed by:	Form checked by:
Name:	Name:
Designation:	Designation:
Place:	Place:
Date:	Date:

## REFERENCE INFORMATION FOR USERS

### APGAR Scoring

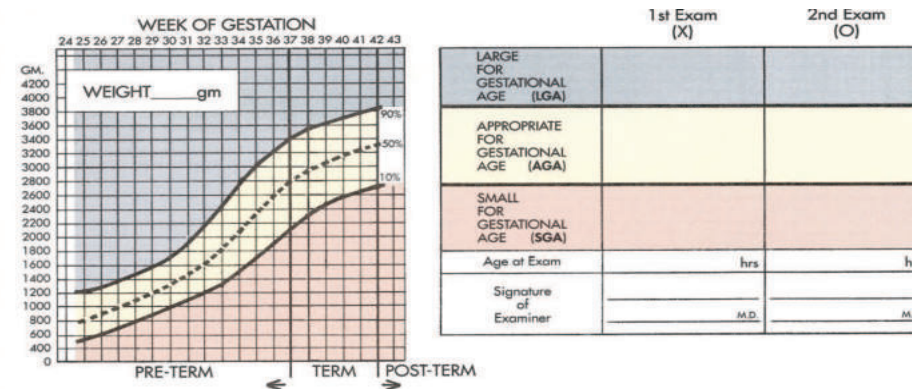
Sign	0	1	2
Heart Rate	Absent	Slow <100	>100
Respiratory Effort	Absent	Irregular, slow, weak cry	Good, strong cry
Muscle Tone	Limp	Some flexion of extremities	Well flexed
Reflex Irritability	No response	Grimace	Cry, sneeze
Colour	Blue, Pale	Body pink, extremities blue	Completely pink

Write the total scores observed in all the 5(five) parameter at 1 and 5 minutes after birth and repeat at 10 minutes if condition is not stabilised. Each item or parameter is given a score of 0, 1 or 2 based on the indicators as given in the table.

Total scores of 0 to 3 —————> Severe distress in adjusting to extra uterine life  
 Total scores of 4 to 6 —————> Moderate difficulty in adjusting to extra uterine life  
 Total scores of 7 to 10 —————> Absence of difficulty in adjusting to extra uterine life

### Assessment of birth weight related to gestational age

Classification of infants at birth by both *birth weight* and *gestational age* provides a more satisfactory method for predicting mortality risks and providing guidelines for management of the neonate than estimating gestational age or birth weight alone



Appropriate for gestational age (AGA) —————> Weight between 10<sup>th</sup> and 90<sup>th</sup> percentile  
 Large for gestational age (LGA) —————> Weight above 90<sup>th</sup> percentile  
 Small for gestational age (SGA) —————> Weight below 10<sup>th</sup> percentile

## Details on birth defects

<u>Cardiac conditions</u>	<u>Cranio-facial conditions</u>	<u>Chromosomal anomaly</u>	<u>Genital / urinary conditions</u>
PDA	Cleft-lip/cleft palate	Trisomy 13 (Patau)	Hypospadias
ASD	Anencephaly	Trisomy 18 (Edward)	Renal Mass
VSD	Hydrocephalus	Trisomy 21 (Down)	Indeterminate sex
Hypoplastic left heart	Microcephaly		
Tetralogy of Fallot			
Transposition of great arteries			
Co-arcuation of aorta			
	<u>Musculoskeletal conditions</u>		<u>Gastrointestinal</u>
	Spina bifida    Syndactyly		Tracheo-esophageal fistula
	Meningocele    CTEV		Diaphragmatic hernia
	Meningomyelocele    DDH (DDH)		Rectal atresia/ stenosis
	Polydactyly		Imperforate anus
			Omphalocele/ gastrochisis

## Details on morbidity conditions

<u>Respiratory</u>	<u>Cardiovascular</u>	<u>CNS</u>	<u>Haematological</u>	<u>GIT</u>
HMD	Arrhythmias	Perinatal asphyxia	Feto-maternal transfusion	Haemorrhage
TTN	Hypotension	Seizures	Twin to twin transfusion	NEC
Meconium aspiration	Hypertension	ICH	Extravasation	
Apnea of prematurity			Cord complications	
Pulmonary haemorrhage		<u>Infections</u>	ABO/Rh/G6PD	
Pneumothorax		Viral	Other haemotolic	
Pulmonary intestinal pneumonia		Bacterial	Polycythemia	
Chronic lung disease		TORCH	Jaundice	
		Nosocomial		
		Meningitis		
<u>Metabolic/Endocrine</u>				
IDM				
Hypoglycaemia				
Hypocalcaemia				

## List of maternal medications

Pethidine	Anti-convulsants
Morphine	Insulin
MgSo4	Anti-hypertensives
Diazepam	Thyroid medications
Steroids	

## Appendix 7

### labour care guide

## WHO LABOUR CARE GUIDE

Name		Parity		Labour onset		Active labour diagnosis [Date									
Ruptured membranes [Date		Time		] Risk factors											
		<div>Time</div> <div>Hours</div> <div>1 2 3 4 5 6 7 8 9 10 11 12</div>										<div>1 2</div>			
		<div>ALERT</div> <div>ACTIVE FIRST STAGE</div>										<div>SECOND STAGE</div>			
SUPPORTIVE CARE	Companion	N													
	Pain relief	N													
	Oral fluid	N													
	Posture	SP													
BABY	Baseline FHR	<110, ≥160													
	FHR deceleration	L													
	Amniotic fluid	M+++, B													
	Fetal position	P, T													
	Caput	+++													
	Moulding	+++													
WOMAN	Pulse	<60, ≥120													
	Systolic BP	<80, ≥140													
	Diastolic BP	≥90													
	Temperature °C	<35.0, ≥37.5													
	Urine	P++, A++													
	Contractions per 10 min	≤2, >5													
	Duration of contractions	<20, >60													
LABOUR PROGRESS	Cervix [Plot X]	10													
		9	≥ 2h												
		8	≥ 2.5h												
		7	≥ 3h												
		6	≥ 5h												
		5	≥ 6h												
	Descent [Plot O]	5													
		4													
		3													
		2													
		1													
		0													
MEDICATION	Oxytocin (U/L, drops/min)														
	Medicine														
	IV fluids														
SHARED DECISION-MAKING	ASSESSMENT														
	PLAN														
	INITIALS														

In active first stage, plot 'X' to record cervical dilatation. Alert triggered when lag time for current cervical dilatation is exceeded with no progress. In second stage, insert 'P' to indicate when pushing begins.

INSTRUCTIONS: CIRCLE ANY OBSERVATION MEETING THE CRITERIA IN THE "ALERT" COLUMN, ALERT THE SENIOR MIDWIFE OR DOCTOR AND RECORD THE ASSESSMENT AND ACTION TAKEN! LABOUR EXTENDS BEYOND 12H, PLEASE CONTINUE ON A NEW LABOUR CARE GUIDE.  
Abbreviations: Y = Yes, N = No, D = Declined, U = Unknown, SP = Supine, MO = Mobile, E = Early L = Late, V = Variable, I = Intact, C = Clear, M = Meconium, B = Blood, A = Anterior, P = Posterior, T = Transverse, P+ = Protein, A+ = Acetone

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Appendix 8  
Maternal Death reporting form



QI-MP/F/09/028-0

MATERNAL DEATH NOTIFICATION FORM

Maternal and Perinatal Morbidity and Mortality Review Committee

Ministry of Health and Family  
Maldives  
March 2010

**MATERNAL AND PERINATAL MORBIDITY AND MORTALITY REVIEW COMMITTEE**

Ministry of Health and Family, Male' Republic of Maldives

**MATERNAL DEATH NOTIFICATION FORM**

For office use only: Quality Assurance and Improvement Division

**NOTE:**

1. This form must be completed for all deaths in pregnant women or within 42 days after termination of pregnancy, including abortions, ectopic gestations, motor vehicle accidents and suicide related deaths irrespective of duration or side of pregnancy.
2. Please refer to the guideline "Guidelines for completing the maternal death notification form" this will be available from, [www. http://www.health.gov.mv](http://www.health.gov.mv) or can be obtained from QAID / MoHF
3. Mark with an (X) where applicable (? Means unknown)
4. Attach a copy of the complete case records and anesthetic forms to this form
5. Complete the form within 48 hours of a maternal death. The completed form is sent to the Quality Assurance and Improvement Division, Ministry of Health and Family.
6. All maternal death must be discussed at an institutional mortality meeting will assist in the completion of selections 8, 9 and 10 of this form.

Address of contact person (including contact number, Head of health facility)

Case discussed at institutional mortality meeting

YES ☐NO ☐IF YES: DATE ☐**1. LOCALITY WHERE DEATH OCCURRED**

Name of the health facility.....

Island.....

Atoll.....

Others : (E.G. boat, flight, home)

**2. DETAILS OF DECEASED**

Name: .....

Inpatient No: .....

Address: .....

Age (yrs).....

Gravida.....Para at delivery.....Gestation (weeks) or at delivery).....

Days since delivery/ miscarriage.....

The information contained in this form is ONLY for the use of MPMMRC and is SOLEY intended to be used to prevent maternal and perinatal deaths to improve the service related to maternal and neonatal care

**3. ADMISSION AT INSTITUTION WHERE DEATH OCCURRED OR FROM WHERE IT WAS REPORTED**

Date of admission: d...../m.....y..... Time of death: 24hrs.....min.....

Date of death: d...../m.....y..... Time of death: 24hrs.....min.....

<b>On admission</b>	Miscarriage / ectopic	Antenatal	Intrapartum	Postpartum	
<b>Condition on admission</b>	Stable	Critically ill	Dead on arrival	Other- specify	
<b>Diagnosis at moment of death</b>	Miscarriage	Ectopic pregnancy	Not in labour	In labour	Postpartum

Reasons for admission.....

.....

.....

.....

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.....

Referral from another centre? Y.....N.....If "Y" from:.....

**4. ANTENATAL CARE**

Did she receive antenatal care? Y.....N.....

If "Y" at what locality:

Health centre	Atoll Hospital	Regional Hospital	Tertiary Hospital	PVT Clinic
---------------	----------------	-------------------	-------------------	------------

Was the gestational age at booking &lt;20 wks? Y..... No..... Total number of visits.....

Antenatal Risk Factors

Risk	Y	N		
Past Medical History			Specify:	
Hypertention				
Proteinuria			Other-Specify	
Glycosuria				
Anameia				
Abdnormal lie				
Previous / Section				

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[illegible]

Did labour occur: Y ☐ N ☐ If "Y" was a partogram used? Y ☐ N ☐

short	Normal	Prolonged	CPD present
-------	--------	-----------	-------------

Undelivered	Vaginal (unassisted)	Vaginal Vaccum / forceps	Caesarean section
-------------	----------------------	--------------------------	-------------------

Baby birth weight(g).....	5min Apgar.....outcome	Stillborn	Neonatal	Alive
1000-1499	7-10	1	1	1
1500-1999	7-10	1	1	1
2000-2499	7-10	1	1	1
2500-2999	7-10	1	1	1
3000-3499	7-10	1	1	1
3500-3999	7-10	1	1	1
4000-4499	7-10	1	1	1
4500-4999	7-10	1	1	1
5000-5499	7-10	1	1	1
5500-5999	7-10	1	1	1
6000-6499	7-10	1	1	1
6500-6999	7-10	1	1	1
7000-7499	7-10	1	1	1
7500-7999	7-10	1	1	1
8000-8499	7-10	1	1	1
8500-8999	7-10	1	1	1
9000-9499	7-10	1	1	1
9500-9999	7-10	1	1	1
10000-10499	7-10	1	1	1
10500-10999	7-10	1	1	1
11000-11499	7-10	1	1	1
11500-11999	7-10	1	1	1
12000-12499	7-10	1	1	1
12500-12999	7-10	1	1	1
13000-13499	7-10	1	1	1
13500-13999	7-10	1	1	1
14000-14499	7-10	1	1	1
14500-14999	7-10	1	1	1
15000-15499	7-10	1	1	1
15500-15999	7-10	1	1	1
16000-16499	7-10	1	1	1
16500-16999	7-10	1	1	1
17000-17499	7-10	1	1	1
17500-17999	7-10	1	1	1
18000-18499	7-10	1	1	1
18500-18999	7-10	1	1	1
19000-19499	7-10	1	1	1
19500-19999	7-10	1	1	1
20000-20499	7-10	1	1	1
20500-20999	7-10	1	1	1
21000-21499	7-10	1	1	1
21500-21999	7-10	1	1	1
22000-22499	7-10	1	1	1
22500-22999	7-10	1	1	1
23000-23499	7-10	1	1	1
23500-23999	7-10	1	1	1
24000-24499	7-10	1	1	1
24500-24999	7-10	1	1	1
25000-25499	7-10	1	1	1
25500-25999	7-10	1	1	1
26000-26499	7-10	1	1	1
26500-26999	7-10	1	1	1
27000-27499	7-10	1	1	1
27500-27999	7-10	1	1	1
28000-28499	7-10	1	1	1
28500-28999	7-10	1	1	1
29000-29499	7-10	1	1	1
29500-29999	7-10	1	1	1
30000-30499	7-10	1	1	1
30500-30999	7-10	1	1	1
31000-31499	7-10	1	1	1
31500-31999	7-10	1	1	1
32000-32499	7-10	1	1	1
32500-32999	7-10	1	1	1
33000-33499	7-10	1	1	1
33500-33999	7-10	1	1	1
34000-34499	7-10	1	1	1
34500-34999	7-10	1	1	1
35000-35499	7-10	1	1	1
35500-35999	7-10	1	1	1
36000-36499	7-10	1	1	1
36500-36999	7-10	1	1	1
37000-37499	7-10	1	1	1
37500-37999	7-10	1	1	

[illegible]

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**6. INTERVENTIONS** (Tick appropriate box)

Early pregnancy	Antenatal	Intrapartum	Postpartum	Other
Evacuation	Transfusion	Instrumental delivery	Evacuation	Anaesthesia GA
Laparotomy			Laparotomy	Epidural
Hysterectomy		Caesarean section	Hysterectomy	Spinal
Transfusion		Hysterectomy	Transfusion	Local
		Transfusion	Manual Removal	Invasive monitoring
Other- specify				ICU ventilation

Comments on interventions (if block insufficient, use an extra sheet of paper)

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**7. CASE SUMMARY** (please supply a short summary of the events surrounding the death)

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The information contained in this form is ONLY for the use of MPMMRC and is SOLEY intended to be used to prevent maternal and perinatal deaths to improve the service related to maternal and neonatal care

This image shows a single sheet of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins or other markings on the paper.

Cause of death: specify disease entity:

[illegible]

Please mark contributory conditions below

Was there prolonged / obstructed labour?	Y	N	N/A				
Was there previous / caesarean labour?	Y	N	?	Was the woman anaemic during pregnancy?	Y	N	?

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**9. IN YOUR OPINION DID ANY OF THE FOLLOWING FACTORS CONTRIBUTE TO THE DEATH OF THIS PATIENT?**

System	Example	Y	N	?	Specify
Personal / Family	Delay in women seeking help				
	Declined treatment or admission				
	Others: specify				
Logistical system	Lack of transport from home to health care facility				
	Lack of transport between health care facility				
	Health service- health service communication breakdown				
Facilities	Lack of facilities, equipments or consumables (drugs, infusion sets, blood, fluids, etc)				
Health personnel problems	Lack of human resources				
	Lack of expertise, training or education				
	Delays in referral				
	Delays in appropriate action				

Comments on potential avoidable factors, missed opportunities and substandard care

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*Please note that substandard care includes inadequate monitoring as well as substandard management*

**10. WHAT HAS YOUR INSTITUTION LEARNT FROM THIS CASE AND WHAT ACTIONS DO YOU ENVISAGE FROM THIS LEARNING PROCESS (If applicable)**

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The information contained in this form is ONLY for the use of MPMMRC and is SOLEY intended to be used to prevent maternal and perinatal deaths to improve the service related to maternal and neonatal care

**11. THIS IS FORM COMPLETED BY:**

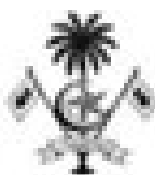
Name (print).....	Designation.....
Telephone.....	Fax.....
Signature.....	

Last updated on: 15<sup>th</sup> March 2010

The information contained in this form is ONLY for the use of MPMRC and is SOLEY intended to be used to prevent maternal and perinatal deaths to improve the service related to maternal and neonatal care



## Appendix 9



Incident No:

## SHOULDER DYSTOCIA REPORTING FORM

Name of the hospital:

Situation	Name of the patient		Hospital No		Gestation		Primi	Date		
							Multi			
	Place of birth:		Labour room			OT		Other		
	Mode of delivery:		SVD		Vacuum		Forceps			
	Labour:		Spontaneous		IOL		Miso		Augmented	
							Synto			
Risk factors:	Previous h/o shoulder dystocia		Macrosomia		Diabetes		BMI>30	None		
H	Help called time:				Emergency bell call time:					
Staffing	Staff name and designation						Time of arrival			
	Person conducting delivery									
	Most senior midwife									
	Most senior obstetrician									
	Pediatrician									
Procedure used to assist delivery	Maneuver		Order	Time	Bywhom		Reason if not performed			
	E	Episiotomy								
	L	McRoberts' position								
	P	Suprapubic pressure					From maternal	Left	Right	
	E	Internal rotation Maneuvers								
	R	Removal of Posterior Arm					Left	Right		
	R	Roll on all fours (Gaskin's)								
		Description of traction	Routine axial (as in normal vaginal delivery)				Others			
		Other maneuvers used								
Outcome	Perineal trauma:		Intact	1st degree		2nd degree		3rd degree		4th degree
	Episiotomy									
	Length of labour:		1st Stage:				2nd stage:			
	Time of delivery of head:						Head to body interval: mins			
	Fetal position during dystocia		<input type="checkbox"/> Head facing maternal left <input type="checkbox"/> Left fetal shoulder anterior				<input type="checkbox"/> Head facing maternal right <input type="checkbox"/> Right fetal shoulder anterior			
	Birth weight:		Apgar:		1 minute		5-minute		10 minute	
	Baby examined by:									
	Arm weakness:		Yes	No	Left	Right	If yes to any of these questions for review and follow up by a pediatrician			
	Sign of fracture		Yes	No	Left	Right				
	Baby admitted		Yes	No						
Discussion with parents		Yes	No	Bywhom:						
Name and designation of the person completing form:										Signature
Adapted from NHS foundation 2019										Reference: RCOG,2012

## Appendix 10

### SHOULDER DYSTOCIA DOCUMENTATION

Date:

Time:

Person completing form ..... Designation.....

Signature.....

Mother's Name: \_\_\_\_\_  
Date \_\_\_\_\_ of \_\_\_\_\_ birth: \_\_\_\_\_  
Hospital \_\_\_\_\_ Number: \_\_\_\_\_  
Consultant: \_\_\_\_\_

Called for help at:		Emergency Cell via switchboard at:		
Staff present at delivery of head		Additional staff attending for delivery of shoulders		
Name	Role	Name	Role	Time arrived

Procedures used to assist delivery	By whom	Time	Order	Details	Reason if not performed
McRobert's Position					
Suprapubic pressure				From maternal <b>left/right</b> (circle as appropriated)	
Episiotomy				Enough access/ tear present/ already performed (Circle as appropriate)	
Delivery of posterior arm				<b>Right/left</b> arm (Circle as appropriate)	
Internal rotational maneuvers used					
Description of rotation					
Description of traction	Routine axial (as in normal vaginal delivery)	other -		Reason if not routine axial:	
Other maneuvers used					

Mode of delivery of head		Spontaneous		Instrumental - vacuum / forceps	
Time of delivery of head			Time of delivery of baby	Head- to body delivery interval	
Fetal position during dystocia		Head facing maternal <b>left</b> Left fetal shoulder anterior		Head facing maternal <b>right</b> Right fetal shoulder anterior	
Birth weight:	kg	Apgar:	1 min:	5 mins:	10 mins:
Cord gases		Art pH:	Art BE:	Venous pH:	Venous BE:
Explanation to parents		Yes	By:	AIMS form completed	Yes
Neonatologist called? Yes		Neonotologist arrived:.....			
Name.....					
If neonatologist not called or didn't arrive, give reason:.....					
Baby assessment after birth ( Maybe done by M/W): Any sign of arm weakness? Any sign of potential bone fracture? Baby admitted to Neonatal Intensive Care Unit? <b>Assessment by</b> .....		Yes Yes Yes	No No No	If yes to any of these questions for review and follow up by consultant neonatologist	





