National Guideline on Antenatal and Postnatal Care in the Maldives
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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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18 September 2022

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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-equipped 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
Ministry Of Health
Acknowledgement

Appreciation goes towards those organizations, institutions and individuals for bringing their expertise and experience around the table and continuous engagement and contribution in the development of this guideline and standards.

Highly appreciative for the contributions made by the Obstetric and Gynaecologists and Nurses team of Indhira Gandhi Memorial Hospital (IGMH), Hulhumale Hospital (HMH), ADK Hospital and Treetop Hospital (TTH) who kindly came onboard and shared their evidence based clinical expertise in this area during the finalization of the document.

Sincerely thank the technical team and the panel of experts who have been instrumental, namely Dr. Shanaz Dole, Dr. Hawwa Inaya, Dr. Juhaina Hameed, Dr. Lina Saleem, Ms. Humaira Jamal, Ms. Sheeza Abdul Wahid, Ms. Saadha Moosa, Ms. Aishath Aasthana and Ms. Aishath Shafeeu who brought in their expertise in the field and worked tirelessly in reviewing, updating and development of this National Guideline in the Management of pregnancy, labour and birth and the postpartum period.

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

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<th>Abbreviation</th>
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<tr>
<td>ACOG</td>
<td>American College of Obstetricians and Gynecology</td>
</tr>
<tr>
<td>AKI</td>
<td>Acute Kidney Injury</td>
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<td>AMTSL</td>
<td>Active Management of Third Stage of Labour</td>
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<tr>
<td>ANC</td>
<td>Antenatal Care</td>
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<td>APH</td>
<td>Antepartum Haemorrhage</td>
</tr>
<tr>
<td>ARM</td>
<td>Artificial Rupture of Membranes</td>
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<tr>
<td>BMI</td>
<td>Body Mass Index</td>
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<tr>
<td>CCT</td>
<td>Controlled Cord Traction</td>
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<tr>
<td>CFM</td>
<td>Continuous Fetal Monitoring</td>
</tr>
<tr>
<td>COC</td>
<td>Combined Oral Contraceptives</td>
</tr>
<tr>
<td>CPD</td>
<td>Cephalopelvic Disproportion</td>
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<tr>
<td>CRT</td>
<td>Cardiac Resynchronization Therapy</td>
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<tr>
<td>CS</td>
<td>Cesarean Section</td>
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<tr>
<td>CTG</td>
<td>Cardiotocograph</td>
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<tr>
<td>DFM</td>
<td>Decreased Fetal Movements</td>
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<tr>
<td>DV</td>
<td>Domestic Violence</td>
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<tr>
<td>ECV</td>
<td>External cephalic Version</td>
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<td>EDD</td>
<td>Expected Date of Delivery</td>
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<td>FGM</td>
<td>Female Genital Mutilation</td>
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<tr>
<td>FHS</td>
<td>Fetal Heart Sound</td>
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<tr>
<td>FIGO</td>
<td>International Federation of Gynecology and Obstetrics</td>
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<tr>
<td>GDM</td>
<td>Gestational Diabetes mellitus</td>
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<tr>
<td>GTD</td>
<td>Gestational Trophoblastic Disease</td>
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<tr>
<td>GWG</td>
<td>Gestational Weight Gain</td>
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<tr>
<td>HCG</td>
<td>Human Chorionic Gonadotrophin</td>
</tr>
<tr>
<td>HDU</td>
<td>High Dependency Unit</td>
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<tr>
<td>HELLP</td>
<td>Hemolysis, Elevated Liver Enzymes and Low Platelets</td>
</tr>
<tr>
<td>HELPER</td>
<td>Help Evaluate for episiotomy Legs (McRoberts Manoeuvre) Pressure (Suprapubic) Enter vagina (Internal maneuvers) Remove the posterior arm and Roll the patient into all fours</td>
</tr>
<tr>
<td>HIP</td>
<td>Hyperglycemia In Pregnancy</td>
</tr>
<tr>
<td>HIV</td>
<td>Human Immunodeficiency Virus</td>
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<tr>
<td>Acronym</td>
<td>Full Form</td>
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<tr>
<td>HPA</td>
<td>Health Protection Agency</td>
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<td>HPE</td>
<td>Holoprosencephaly</td>
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<td>ICT</td>
<td>Indirect Coombs Test</td>
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<tr>
<td>IOL</td>
<td>Induction of Labour</td>
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<tr>
<td>IUCD</td>
<td>Intra Uterine Contraceptive Device</td>
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<td>IUFD</td>
<td>Intra Uterine Fetal Demise</td>
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<td>IUGR</td>
<td>Intra Uterine Growth Restriction</td>
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<tr>
<td>IVF</td>
<td>Invitro Fertilization</td>
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<tr>
<td>KMC</td>
<td>Kangaroo Mother care</td>
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<tr>
<td>LBW</td>
<td>Low Birth Weight</td>
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<tr>
<td>LCG</td>
<td>Labour Care Guide</td>
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<td>LMP</td>
<td>Last Menstrual Period</td>
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<td>LMW</td>
<td>Low Molecular Weight heparin</td>
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<td>LOT</td>
<td>Left Occiput Transverse</td>
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<tr>
<td>MDHS</td>
<td>Maldives Demographic Health Survey</td>
</tr>
<tr>
<td>MgSo4</td>
<td>Magnesium sulphate</td>
</tr>
<tr>
<td>MNC</td>
<td>Maternal Child Nutrition</td>
</tr>
<tr>
<td>NICU</td>
<td>Neonatal Intensive Care Unit</td>
</tr>
<tr>
<td>NIPT</td>
<td>Non-invasive Prenatal testing</td>
</tr>
<tr>
<td>NVP</td>
<td>Nausea and vomiting in pregnancy</td>
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<tr>
<td>OGTT</td>
<td>Oral Glucose Tolerance Test</td>
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<tr>
<td>OSA</td>
<td>Obstructive Sleep Apnea</td>
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<tr>
<td>PCOS</td>
<td>Polycystic Ovary Syndrome</td>
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<tr>
<td>PHU</td>
<td>Public Health Units</td>
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<tr>
<td>PID</td>
<td>Pelvic Inflammatory Disease</td>
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<tr>
<td>PNC</td>
<td>Postnatal Care</td>
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<tr>
<td>POC</td>
<td>Product of Conception</td>
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<tr>
<td>PPH</td>
<td>Postpartum Haemorrhage</td>
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<tr>
<td>PPROM</td>
<td>Preterm Premature Rupture of Membranes</td>
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<tr>
<td>PROM</td>
<td>Prelabour Rupture of Membranes</td>
</tr>
<tr>
<td>QARD</td>
<td>Quality Assurance and regulations Division</td>
</tr>
<tr>
<td>RHC</td>
<td>Reproductive Health Centre</td>
</tr>
<tr>
<td>ROT</td>
<td>Right Occiput Transverse</td>
</tr>
<tr>
<td>SGA</td>
<td>Small for Gestational Age</td>
</tr>
<tr>
<td>STI</td>
<td>Sexually Transmitted Infections</td>
</tr>
<tr>
<td>Acronym</td>
<td>Definition</td>
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<tr>
<td>TORCH</td>
<td>Toxoplasmosis Other agents, Rubella, Cytomegalovirus, and Herpes simplex.</td>
</tr>
<tr>
<td>TTTS</td>
<td>Twin to Twin Transfusion Syndrome</td>
</tr>
<tr>
<td>USG</td>
<td>Ultrasonogram</td>
</tr>
<tr>
<td>VBAC</td>
<td>Vaginal Birth After Caesarean section</td>
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<tr>
<td>VTE</td>
<td>Venous Thrombo Embolism</td>
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<td>WHO</td>
<td>World Health Organization</td>
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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)
**Nutritional condition**

- Information, education, and counselling
- Well balanced nutritional diet
- Iron and folic acid supplement
- Screen for anaemia 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

**Well balanced nutritional diet**

**Iron and folic acid supplement**

**Screen for anaemia and diabetes**

**Promote exercise**

**Iodization of salt**

**Nutritional condition**

**Mental health**

**Tobacco use**
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
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 women 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>
<thead>
<tr>
<th>Contact</th>
<th>Gestational Age</th>
<th>Clinical examinations</th>
<th>Investigations</th>
<th>Medications/ advice</th>
<th>Follow up</th>
</tr>
</thead>
</table>
| 1       | (Missed periods to 8 weeks) | » Fill ANC card in full detail completing medical surgical and obstetric history, psychosocial history  
» Initial comprehensive clinical assessment including pallor, BMI, vitals & systemic examination.  
» Thalassaemia status of both partners  
» Smoking history | » Full Blood Count, platelet, RBS, urine RE and CS  
» Blood group and typing  
» G6PD  
» Screening for HIV, HbsAg, HCV, VDRL & vitamin-D  
» USG for fetal viability and dating  
» If indicated TSH, fT3, fT4, OGTT & HbA1C | » T. Folic acid 400 micrograms once daily  
» Consider iron calcium supplement  
» Health education on healthy eating and physical activity | » Follow up with reports  
» Next visit at 8-12 weeks |
<table>
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<tr>
<th>Contact</th>
<th>Gestational Age</th>
<th>Clinical examinations</th>
<th>Investigations</th>
<th>Medications/ advice</th>
<th>Follow up</th>
</tr>
</thead>
</table>
| 2       | 8-12 weeks      | - Confirmation of EDD by correlation with radiological expected date of delivery.  
- Urine dipstick – protein and glucose  
- Pallor, BP, Weight  
- Ask about fetal movementUrine dipstick – urine for protein and glucose | - USG for early anomaly scan (between 11-14 weeks)  
- (NT and NB) and dating  
- Optional prenatal screening for chromosomal abnormalities (NIPT and double marker) | - T. Folic acid 400 micrograms OD  
- Start iron calcium supplement (after 12 weeks)  
- Health education  
- Healthy eating and physical activity | - Next ANC visit at 15-17 weeks.  
- Review previous investigation reports |
| 3       | 15-17 weeks     | - Pallor, BP, Weight  
- Fundal height  
- Ask about fetal movement  
- Urine dipstick – urine for protein and glucose | - Review for medical termination as per fatwa (IFA/2013/06). | - Continue iron and calcium supplement | - Next visit 18-24 weeks |
| 4       | 18-24 weeks     | - Pallor, BP, Weight, Fundal height, FHS  
- Ask about fetal movement  
- Urine dipstick – urine for protein and glucose | - Detailed anomaly scan for Structural abnormalities  
- OGGT (24-28weeks)  
- HbA1c  
- Full blood count  
- urine R/E and CS  
- ICT in Rh negative mothers | - T Iron (30-60mg  
elemental iron) once daily  
- T Calcium 1000mg once daily  
- Review tetanus toxoid immunization and offer  
- booster dose  
- Consider Albendazole 400mg stat | - Next visit at 28weeks |
<table>
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<tr>
<th>Contact</th>
<th>Gestational Age</th>
<th>Clinical examinations</th>
<th>Investigations</th>
<th>Medications/ advice</th>
<th>Follow up</th>
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</thead>
</table>
| 5       | 28-32 weeks     | » Pallor, BP, Weight  
» Fundal height  
» FHS  
» Ask about fetal movement  
» Ask about fetal movement  
» Urine dipstick – urine for protein and glucose | » Review reports: OGTT, HbA1c  
» If ICT negative then Anti-D 1st dose at 28 weeks (repeat at 34 weeks) | » T Iron (30 to 60mg elemental iron) once daily  
» T. Calcium 1000mg once daily  
» Review tetanus toxoid immunization and offer booster dose | » Next ANC visit at 32 to 34 weeks |
| 6       | 32-34 weeks     | » Pallor, BP, Weight  
» Fundal height  
» FHS  
» Ask about fetal movement  
» Ask about fetal movement  
» Urine dipstick – urine for protein and glucose | » Scan for growth and placental localization | » T. Iron (30-60mg elemental iron) once daily  
» T. Calcium 1000mg once daily  
» Anti-D prophylaxis second dose for Rh negative mothers  
» Educate mother to recognize change in fetal movements | » Next 34 weeks |
| 7       | 34-36 weeks     | » Pallor, BP, Weight  
» Fundal height  
» FHS  
» Ask about fetal movement  
» Ask about fetal movement  
» Urine dipstick – urine for protein and glucose | » Full blood count  
- Fasting blood sugar  
- Post prandial blood sugar  
- HbA1c and urine RE | » T.Iron (30-60mg elemental iron) once daily  
» T. Calcium 1000mg once daily  
» Educate mother to recognize change in fetal movements | » Next ANC visit at 37 weeks |
<table>
<thead>
<tr>
<th>Contact</th>
<th>Gestational Age</th>
<th>Clinical examinations</th>
<th>Investigations</th>
<th>Medications/ advice</th>
<th>Follow up</th>
</tr>
</thead>
</table>
| 8       | 37 weeks        | » Pallor, BP, Weight  
» Fundal height  
» FHS  
» Ask about fetal movement  
» Urine dipstick  
» protein and glucose | » Review reports:  
» USG for fetal well-being | » T. Iron (30-60mg elemental iron) once daily  
» T. Calcium 1000mg once daily  
» Fetal kick count charting at home  
» Explain danger signs  
» Birth preparedness | » Next ANC visit at 38 weeks with reports |
| 9       | 38 weeks        | » Pallor, BP, Weight  
» Fundal height  
» FHS  
» Ask about fetal movement  
» Urine dipstick – urine for protein and glucose  
» Pelvic assessment | » Review reports: | » T. Iron (30-60mg elemental iron) once daily  
» T. Calcium 1000mg once daily  
» Fetal kick count charting at home  
» Explain danger signs  
» Birth preparedness | » Next ANC visit at 39 weeks |
| 10      | 38 weeks        | » Pallor, BP, Weight  
» Fundal height  
» FHS  
» Ask about fetal movement  
» Urine dipstick – urine for protein and glucose | » Review reports: | » T. Iron (30-60mg elemental iron) once daily  
» T. Calcium 1000mg once daily  
» Fetal kick count charting at home  
» Explain danger signs  
» Birth preparedness | » Next ANC visit at 40 weeks  
» Delivery plan |
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.
Neurologic complications
   a. Wernicke's encephalopathy due to thiamine deficiency
   b. Pontine myelinolysis
   c. Peripheral neuritis
   d. Korsakoff's psychosis

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

1. Wernicke's encephalopathy
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

<table>
<thead>
<tr>
<th>Sign and symptoms</th>
<th>Cause</th>
<th>Investigations</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>» Dysuria</td>
<td>Cystitis</td>
<td>Urine microscopy (Showing white cells in clumps, bacteria and RBCs) and culture sensitivity if available</td>
<td>- Symptomatic management (e.g. use of urinary alkalisers)</td>
</tr>
<tr>
<td>» Increased frequency and urgency of urination</td>
<td></td>
<td></td>
<td>- Safe use of oral antibiotics as per culture report</td>
</tr>
<tr>
<td>» Spiking fever/chills</td>
<td>Acute pyelonephritis</td>
<td>Urine microscopy (Showing white cells in clumps, bacteria and RBCs) and culture sensitivity if available</td>
<td>- Start antibiotic, without waiting for culture report.</td>
</tr>
<tr>
<td>» Increased frequency and urgency of urination</td>
<td></td>
<td></td>
<td>Ampicillin 2gm IV stat and 1 gm 6 hourly</td>
</tr>
<tr>
<td>» Abdominal pain</td>
<td></td>
<td></td>
<td>- Ensure adequate hydration</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Give Paracetamol 500mg orally as needed for pain and to lower temperature</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Refer to a specialist</td>
</tr>
<tr>
<td>Sign and symptoms</td>
<td>Cause</td>
<td>Investigations</td>
<td>Management</td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
<td>------------</td>
<td>-----------------------------------------------------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>‣ Foul-smelling vaginal discharge in first 22 weeks</td>
<td>Septic abortion</td>
<td></td>
<td>Refer to specialist</td>
</tr>
<tr>
<td>‣ Fever and Tender uterus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>‣ Fever, sore throat, cold, cough, runny nose, nasal congestion</td>
<td>URTI</td>
<td>Chest X-ray (with abdominal shield)</td>
<td>- Symptomatic management</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Hydration</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Antihistamines (Cetirizine and Fexofenadine)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Paracetamol</td>
</tr>
<tr>
<td>‣ Fever</td>
<td>Pneumonia</td>
<td>CXR (with abdominal shield)</td>
<td>Iv antibiotics</td>
</tr>
<tr>
<td>‣ Difficulty in breathing</td>
<td></td>
<td></td>
<td>Steam inhalation</td>
</tr>
<tr>
<td>‣ Cough with expectoration</td>
<td></td>
<td></td>
<td>Refer to specialist</td>
</tr>
<tr>
<td>‣ Chest pain</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>‣ Sudden high-grade fever</td>
<td>Dengue</td>
<td>- Full Blood count, LFT, Electrolytes,</td>
<td>- Adequate hydration</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- NS1 Antigen,</td>
<td>- Multidisciplinary care</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Dengue IgG and IgM</td>
<td>- Monitor for warning signs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>‣ Fever</td>
<td>Hepatitis</td>
<td>LFT, Hepatitis virus panel</td>
<td>Refer to specialist</td>
</tr>
<tr>
<td>‣ Malaise</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>‣ Anorexia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>‣ Nausea</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>‣ Dark urine and pale stool</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>‣ Yellow skin and sclera</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*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

- Patient admitted to hospital
  - Obtain baseline Full blood count (CBC)
  - Monitor fluid intake and encourage oral fluid intake
  - Monitor vital sings every 4 hourly or more frequently

**Adequate oral fluid intake**
- Continue monitoring vital signs
- Observe for early signs of shock
- Observe for warning signs of severe dengue

**Clinically stable and no change or minimal change in HCT**
- Continue isotonic crystalloids at 2-3ml/kg/hour for 2-4 hours
- Recheck HCT
- Reassess clinical status of patient

**Does patient have adequate oral fluid intake?**
- Yes
  - Follow steps for emergency management
  - Is patient improving?
    - Yes
      - Increase isotonic crystalloids to 5-10ml/kg/hour for 1-2 hours
      - Recheck HCT
      - Reassess clinical status of patient
    - No
      - Is patient clinically stable and has no change or minimal change in HCT?
        - Yes
          - Reduce isotonic crystalloids in stepwise manner. Reassess clinical status before each change.
          - 1. 5-10ml/kg/hr for 1-2 hrs
          - 2. 3-5ml/kg/hr for 2-4 hrs
          - 3. 2-3ml/kg/hr for 2-4 hrs
        - No
          - Worsening vital signs and rapidly increasing HCT
          - Increase isotonic crystalloids to 5-10ml/kg/hour for 1-2 hours
          - Recheck HCT
          - Reassess clinical status

- No
  - Patient develops compensated or hypotensive shock
  - Follow steps for emergency management

**inadequate oral fluid intake**
- Yes
  - Give intravenous isotonic crystalloid solutions
  - Give isotonic crystalloids in stepwise manner:
    1. 5-7ml/kg/hour for 1-2 hrs
    2. 3-5ml/kg/hr for 2-4 hrs
- No
  - Does patient have adequate oral fluid intake?
    - Yes
      - Continue monitoring vital signs
      - Observe for early signs of shock
      - Observe for warning signs of severe dengue
    - No
      - Is patient clinically stable and has no change or minimal change in HCT?
        - Yes
          - Reduce isotonic crystalloids in stepwise manner. Reassess clinical status before each change.
          - 1. 5-10ml/kg/hr for 1-2 hrs
          - 2. 3-5ml/kg/hr for 2-4 hrs
          - 3. 2-3ml/kg/hr for 2-4 hrs
        - No
          - Worsening vital signs and rapidly increasing HCT
          - Increase isotonic crystalloids to 5-10ml/kg/hour for 1-2 hours
          - Recheck HCT
          - Reassess clinical status

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.

- **Laboratory tests**
  - Full blood count
  - Haematocrit (HCT)

- **Treatment**
  - Encourage intake of oral fluids. If not tolerated, start intravenous fluid therapy NS or RL at maintenance rate.

- **Monitor**
  - Temperature pattern
  - Volume of fluid intake and losses
  - Urine output
  - Warning signs
  - HCT, WBCs and platelet count

**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/mm3

» 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/mm3

» 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

<table>
<thead>
<tr>
<th>Category</th>
<th>Severity of Anemia</th>
<th>Hemoglobin Level g/dl</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mild</td>
<td>9.5-10.5</td>
</tr>
<tr>
<td>2</td>
<td>Moderate</td>
<td>8.0-9.4</td>
</tr>
<tr>
<td>3</td>
<td>Severe</td>
<td>6.9-7.9</td>
</tr>
<tr>
<td>4</td>
<td>Very severe</td>
<td>&lt;6.9</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Classification</th>
<th>BMI (kg/m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under weight</td>
<td>&lt;18.50</td>
</tr>
<tr>
<td>Normal range</td>
<td>18.50-24.99</td>
</tr>
<tr>
<td>Over weight</td>
<td>25.00-29.99</td>
</tr>
<tr>
<td>Obesity:</td>
<td></td>
</tr>
<tr>
<td>Obese class 1</td>
<td>30.00-34.99</td>
</tr>
<tr>
<td>Obese class 11</td>
<td>35.00-39.99</td>
</tr>
<tr>
<td>Obese class 111/morbid obesity</td>
<td>≥40.00</td>
</tr>
<tr>
<td>Super</td>
<td>&gt;50</td>
</tr>
</tbody>
</table>

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

Table 5: Weight gain recommendations during pregnancy

<table>
<thead>
<tr>
<th>BMI (kg/m²)</th>
<th>Increase in weight throughout 1st trimester (1 - 12 weeks)</th>
<th>Average &amp; range of weight gain recommended for 2nd &amp; 3rd trimesters (13 - 40 weeks)</th>
<th>Recommended weight gain (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under weight</td>
<td>less than 18.5</td>
<td>0.5kg / week (0.44 - 0.58kg)</td>
<td>12-18</td>
</tr>
<tr>
<td>Normal range</td>
<td>18.5-24.9</td>
<td>0.4kg / week (0.35 - 0.50kg)</td>
<td>11-15</td>
</tr>
<tr>
<td>Over weight</td>
<td>25.0-29.9</td>
<td>0.3kg / week (0.23 - 0.33kg)</td>
<td>6-11</td>
</tr>
<tr>
<td>Obesity</td>
<td>30 and above</td>
<td>0.2 kg / week (0.17 - 0.27kg)</td>
<td>5-9</td>
</tr>
</tbody>
</table>
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>
<thead>
<tr>
<th>Complications of obesity for mothers</th>
<th>Complications of obesity for babies</th>
</tr>
</thead>
<tbody>
<tr>
<td>» Miscarriage</td>
<td>» Congenital anomalies (fetal neural tube defects)</td>
</tr>
<tr>
<td>» Gestational diabetes</td>
<td>» Still births</td>
</tr>
<tr>
<td>» Preeclampsia</td>
<td>» Prematurity</td>
</tr>
<tr>
<td>» Venous thromboembolism</td>
<td>» Macrosomia</td>
</tr>
<tr>
<td>» Induction of labour</td>
<td>» Neonatal death</td>
</tr>
<tr>
<td>» Dysfunctional or prolonged labour</td>
<td>» Childhood obesity and metabolic disorders</td>
</tr>
<tr>
<td>» Caesarean section</td>
<td></td>
</tr>
<tr>
<td>» Anaesthetic complications</td>
<td></td>
</tr>
<tr>
<td>» Postpartum Haemorrhage (PPH)</td>
<td></td>
</tr>
<tr>
<td>» Shoulder dystocia</td>
<td></td>
</tr>
<tr>
<td>» Wound infection</td>
<td></td>
</tr>
<tr>
<td>» Mortality</td>
<td></td>
</tr>
<tr>
<td>» Difficulty in initiating and maintaining breastfeeding</td>
<td></td>
</tr>
<tr>
<td>» Puerperal urinary tract infections</td>
<td></td>
</tr>
</tbody>
</table>

### 2.3.3 Management

<table>
<thead>
<tr>
<th>Pre- and inter-conception</th>
<th>Post Barriatric Surgery (BS): micronutrient supplements and monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>» Comprehensive health assessment</td>
<td>» Personalized approach to weight concern and lifestyle</td>
</tr>
<tr>
<td>» Discuss health impacts and options</td>
<td>» Identify/optimize comorbidities (e.g., diabetes mellitus)</td>
</tr>
<tr>
<td>» Consider referral to dietitian</td>
<td></td>
</tr>
<tr>
<td>» Aim to normalize weight</td>
<td></td>
</tr>
<tr>
<td>» Higher dose folic acid daily</td>
<td></td>
</tr>
</tbody>
</table>
## 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 ≥ 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)

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Chronic hypertension:</strong> If hypertension occurs before 20 weeks of gestation or persists for more than 12 weeks postpartum.</td>
</tr>
<tr>
<td>2</td>
<td><strong>Gestational hypertension:</strong> 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 &lt;34 weeks may progress to preeclampsia and have poorer outcomes.</td>
</tr>
<tr>
<td>3</td>
<td><strong>Preeclampsia</strong> De novo or superimposed on chronic hypertension</td>
</tr>
<tr>
<td>4</td>
<td><strong>White-coat hypertension</strong> Refers to elevated office/clinic (≥140/90 mmHg) BP, but normal BP measured at home or work (&lt;135/85 mmHg), there is an increased risk for preeclampsia.</td>
</tr>
<tr>
<td>5</td>
<td><strong>Masked hypertension:</strong> 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.</td>
</tr>
<tr>
<td>6</td>
<td><strong>Proteinuria</strong> 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.</td>
</tr>
<tr>
<td>7</td>
<td><strong>The Hemolysis, Elevated Liver Enzymes, Low Platelets (HELLP) syndrome</strong> is a (serious) manifestation of preeclampsia and not a separate disorder.</td>
</tr>
</tbody>
</table>
2.4.2 Abnormal Proteinuria in Pregnancy

- Dipstick urinalysis. If positive (≥1+, 30 mg/dL), then urine protein/creatinine (Pr/Cr) ratio can be performed.
- Pr/Cr ratio ≥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 >30kg/m²
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/mm³)
» 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

The Spectrum of Preeclampsia

Eclampsia

HELLP Syndrome

HELLP Syndrome
Hemolysis, Elevated Liver enzymes, Low Platelets

Preeclampsia
with severe features develops hepatic and hematologic manifestations

**HELLP syndrome can occur without hypertension or proteinuria**
2.5.2 Management of hypertension in pregnancy

Hypertension SBP ≥ 140 mmHg and/or DBP ≥ 90 mmHg

Maternal investigations and fetal assessment

Inpatient or outpatient care

Maternal or fetal compromise?

Is birth indicated? (See table 7)

NO

YES

Evaluate for delivery

Maternal investigations:
» Urine dipstick for proteinuria
» Spot urine protein to creatinine ratio if:
  ≥ 2+ or recurrent 1+ on dipstick
» Full blood count
» Urea, creatinine electrolytes and uric acid
» LFT including LDH

Fetal assessment:
» CTG
» USG for fetal growth & wellbeing
» Doppler velocimetry

Initiation of antihypertensives
Start treatment if:
» SBP ≥ 160 or DBP ≥ 110 mmHg
Consider treatment if:
» SBP ≥ 140 or DBP ≥ 90 mmHg

Aspirin:
Start low dose aspirin 75mg after 12 weeks of gestation.

Antihypertensive drug
Oral antihypertensive (initial dose – adjust as clinically indicated)
» Methyldopa 500-2000mg /daily
» Labetalol 100 -200mg bd
» Nifedipine (SR) 10–30 mg /daily
» Nifedipine (IR) 10–20 mg BD

Figure 4: Management of hypertension in pregnancy
### Table 9: Indications to consider

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

### 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

<table>
<thead>
<tr>
<th>Management of hypertension and preeclampsia</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Multidisciplinary team approach</td>
</tr>
<tr>
<td>2 Possible HDU</td>
</tr>
<tr>
<td>3 Strict control of BP</td>
</tr>
<tr>
<td>4 Maternal and fetal assessments</td>
</tr>
<tr>
<td>5 Consider magnesium sulphate</td>
</tr>
<tr>
<td>6 Consider corticosteroids if preterm labour anticipated</td>
</tr>
<tr>
<td>7 Strict fluid management</td>
</tr>
<tr>
<td>8 FBC, platelet, LFT including urea, creatinine &amp; LDH</td>
</tr>
<tr>
<td>9 Coagulation screen</td>
</tr>
<tr>
<td>10 Urine for protein</td>
</tr>
<tr>
<td>11 Consider transfer to higher level facility, if required</td>
</tr>
</tbody>
</table>


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

Call for HELP!
Senior Obstetricians, anesthetists, midwives

Airway
- Left lateral position
- Protect airway and maintain patency

Breathing - Assess ventilation

Circulation - Evaluate pulse and BP
If absent circulation, start CPR: 30 chest compressions / 2 breaths
Secure IV access

Control seizures
Loading dose of MgSO₄:
4 g MgSO₄ in 20% solution IV over 10-15 minutes
(Add 8ml of 50% MgSO₄ solution to 12 ml normal saline)

Maintenance dose:
10 g IM (5 g in each buttock), followed by 5 g IM every 4 hours (change sides with each injection)
Continue this treatment for 24 hours after delivery or after last seizures

If seizures continue/recure:
MgSO₄ 2g IV as per loading dose over 5-10 minutes.
Hourly urine out

Control Hypertension:
Reduce BP to around 130-140/90-100 mmHg
Beware maternal hypotension and fetal heart rate abnormalities
LABETALOL Up to 50mg IV stat slowly then IV infusion: 200 mg in 200 ml N Saline at 40 mg/hr,
doubling dose at 1/2 hourly intervals as required to a maximum of 160 mg/hour
NIFEDIPINE 5-10mg oral stat dose (sublingual is not recommended); repeat every 20 mins to a maximum of 40mg
HYDRAZALINE 10mg IV slowly. Repeated doses of HYDRALAZINE 5mg IV 20 minutes apart may be given if necessary

Deliver:
There is no place for continuation of pregnancy if eclampsia occurs
Deliver by vaginal delivery or caesarean section
Stabilize the mother before delivery.
AVOID: Ergometrine should not be used in severe eclampsia/hypertension
Consider prophylaxis against Thromboembolism
Antibiotic prophylaxis
Close monitoring as majority of eclamptic seizures occur after delivery

Observations:
- Pulse oximeter
- BP, Respiration, Temperature
- Urine for proteinuria
- Urine output
- Fluid balance

Investigations:
- Complete blood, RFT LFT, coagulation profile, urine for protein.
- Blood group & cross-match

Site of IM injections of MgSO₄

Monitor:
- Hourly urine output
- Respiratory rate every 15 mins
- Oxygen saturation
- Patellar reflexes 4 hourly
Maintain MgSO₄ administration and monitoring (chart in appendix 3)

Stop infusion if:
- Urine output <30 mls / hour
- Patellar reflexes are absent
- Respiratory rate <16 breaths/min
- Oxygen saturation <90%

Antidote:
10% Calcium gluconate
10ml slow IV over 10 minutes

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

<table>
<thead>
<tr>
<th>Diabetes in pregnancy</th>
<th>Gestational diabetes mellitus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregnancy in previously known diabetes</td>
<td>Hyperglycemia during pregnancy that is not diabetes</td>
</tr>
<tr>
<td>OR</td>
<td>Hyperglycemia diagnosed for the first-time during pregnancy that meets WHO criteria for diabetes mellitus in the nonpregnant state</td>
</tr>
<tr>
<td>May occur anytime during pregnancy including the first trimester</td>
<td>Hyperglycemia diagnosed for the first-time during pregnancy</td>
</tr>
<tr>
<td></td>
<td>May occur anytime during pregnancy but most likely after 24 weeks</td>
</tr>
</tbody>
</table>
2.7.2 Risk factors

- Pre-pregnancy BMI >30kg/m2
- 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 1st hour and 2nd 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.
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
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 ≥90mg/dL and/ or postmeal ≥120mg/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/m²) → 11.4–15.9 kg
» Overweight (BMI 26.1–29.0 kg/m²) → 6.8–11.4 kg
» Obese women (BMI >29 kg/m²) → 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.
Immediate neonatal care

» Early breast feeding

» Monitor for hypoglycemia (capillary blood glucose < 44mg/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

- 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

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Routine care</th>
<th>Caution</th>
<th>Stop</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>History of CVD</strong></td>
<td>Reassurance</td>
<td>Nonemergent Evaluation</td>
<td>Prompt Evaluation</td>
</tr>
<tr>
<td><strong>Self-reported symptoms</strong></td>
<td></td>
<td></td>
<td>Pregnancy Heart Team</td>
</tr>
<tr>
<td><strong>Shortness of breath</strong></td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td><strong>Chest pain</strong></td>
<td>None or mild</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Palpitations</strong></td>
<td>Reflux related those resolves with treatment</td>
<td>Atypical</td>
<td>At rest or with minimal exertion</td>
</tr>
<tr>
<td><strong>Syncope</strong></td>
<td>Dizziness only with prolonged standing or dehydration</td>
<td>Vasovagal</td>
<td>Exertional or unprovoked</td>
</tr>
<tr>
<td><strong>Fatigue</strong></td>
<td>Mild</td>
<td>Mild or moderate</td>
<td>Extreme</td>
</tr>
<tr>
<td><strong>Vital signs HR (beats per minute)</strong></td>
<td>Normal &lt;90</td>
<td>90-119</td>
<td>≥120</td>
</tr>
<tr>
<td><strong>Systolic BP (mmHg)</strong></td>
<td>120-139</td>
<td>140-159</td>
<td>≥160 (or symptomatic low BP)</td>
</tr>
<tr>
<td><strong>PP (per minute)</strong></td>
<td>12-15</td>
<td>16-25</td>
<td>≥25</td>
</tr>
<tr>
<td><strong>Oxygen saturation</strong></td>
<td>&gt;97%</td>
<td>95-97%</td>
<td>&lt;95% (unless chronic)</td>
</tr>
<tr>
<td><strong>Physical examination</strong></td>
<td>Normal</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>JVP</strong></td>
<td>Not visible</td>
<td>Not visible</td>
<td>Visible &gt; 2cm above clavicle</td>
</tr>
<tr>
<td><strong>Heart</strong></td>
<td>S3, barely audible soft systolic murmur</td>
<td>S3, systolic murmur</td>
<td>Loud systolic murmur, diastolic murmur, S4</td>
</tr>
<tr>
<td><strong>Lungs</strong></td>
<td>Clear</td>
<td>Clear</td>
<td>Wheezing, crackles, effusion</td>
</tr>
<tr>
<td><strong>Edema</strong></td>
<td>Mild</td>
<td>Moderate</td>
<td>Marked</td>
</tr>
</tbody>
</table>

Adapted from ACOG – 2019, Pregnancy and Heart Disease
2.8.3 Management Principles

Preconception counselling

Referral to tertiary center – management with senior Obstetrician and cardiologist

Assessment of the pregnant woman
- General health
- Functional health status
- Rule out contraindications to pregnancy

Modifications of medications and anticoagulation

Minimize aggravating factors

Management of pregnancy

Mode, timing, and place of delivery

Antibiotic prophylaxis during labour
- VTE prophylaxis
- Postpartum contraception

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

<table>
<thead>
<tr>
<th>WHO Pregnancy Risk Classification (Risk of pregnancy by medical condition)</th>
<th>Cardiovascular Conditions by WHO Risk Class</th>
</tr>
</thead>
</table>
| WHO Risk Class I  
No detectable increased risk of maternal mortality and no or mild increase in morbidity. | » Uncomplicated, small or mild  
○ Pulmonary stenosis  
○ Patient ductus arteriosus  
○ Mitral valve prolapse  
» Successfully repaired simple lesions (atrial or ventricular septal defect, patent ductus arteriosus, anomalous pulmonary venous drainage).  
» Atrial or ventricular ectopic beats, isolated |
| WHO Risk Class II  
(If otherwise well and uncomplicated)  
Small increased risk of maternal mortality or moderate increase in morbidity. | » Unoperated atrial or ventricular septal defect  
» Repaired tetralogy of Fallot  
» Most arrhythmias |
| WHO Risk Class II or III  
(Depending on individual)  
Risk as indicated in Class II (above) or Class III (below). | » Mild left ventricular impairment  
» Hypertrophic cardiomyopathy  
» Native or tissue valvular heart disease not considered WHO I or IV  
» Marfan syndrome without aortic dilatation  
» Aorta <45 mm in aortic disease associated with bicuspid aortic valve  
» Repaired Coarctation |
### WHO Pregnancy Risk Classification
(Risk of pregnancy by medical condition)

<table>
<thead>
<tr>
<th>WHO Risk Class III</th>
<th>Cardiovascular Conditions by WHO Risk Class</th>
</tr>
</thead>
</table>
| 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. | » Mechanical valve  
» Systemic right ventricle  
» Fontan circulation  
» Cyanotic heart disease (unrepaired)  
» Other complex congenital heart disease  
» Aortic dilatation 40-45 mm in Marfan Syndrome  
» Aortic dilatation 45-50 mm in aortic disease associated with bicuspid aortic valve |

| WHO Risk Class IV (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. | » Pulmonary arterial hypertension of any cause  
» Severe systemic ventricular dysfunction (LVEF <30%, NYHA III-IV)  
» Previous peripartum cardiomyopathy with any residual impairment of left ventricular function  
» Severe symptomatic mitral or aortic stenosis  
» Marfan syndrome with aorta dilated >45 mm  
» Aortic dilatation >50 mm in aortic disease associated with bicuspid aortic valve  
» Native severe Coarctation |

Adapted from WHO, 2017

Table 17: New York Heart Classification

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

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

- Mode of delivery based on obstetric indications and discussion with cardiac team
  - Avoid prolonged labour
  - Induce if cervix is favourable

- Medical management indicated in early labour

- Maintenance of hemodynamic stability

- Management of labour pain

- Prophylactic antibiotics when at risk for infective endocarditis

- Shorten 2nd stage of labour
  - Low forceps
  - Vacuum delivery

- Minimise maternal blood loss
  - Active management of 3rd stage of labour

- Avoid fluid overload with diuretics
  - Early and appropriate fluid replacement

Figuer 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

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Symptoms</th>
<th>Sign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Threatened miscarriage</td>
<td>» Abdominal pain/cramps&lt;br&gt;» Light bleeding</td>
<td>» Closed cervix&lt;br&gt;» Uterus softer than normal and corresponds to dates</td>
</tr>
<tr>
<td>Inevitable miscarriage</td>
<td>(Pregnancy will not continue and will proceed to incomplete/complete miscarriage)&lt;br&gt;» Abdominal pain/cramps&lt;br&gt;» Heavy vaginal bleeding&lt;br&gt;» No expulsion of products of conception</td>
<td>» Dilated cervix&lt;br&gt;» Uterus corresponds to dates&lt;br&gt;» Uterus tender</td>
</tr>
<tr>
<td>Incomplete miscarriage</td>
<td>(Products of conception are partially expelled)&lt;br&gt;» Cramping/lower abdominal pain&lt;br&gt;» Heavy vaginal bleeding&lt;br&gt;» Partial expulsion of products of conception</td>
<td>» Dilated cervix&lt;br&gt;» Uterus smaller than dates</td>
</tr>
<tr>
<td>Complete miscarriage</td>
<td>(Products of conception are completely expelled)&lt;br&gt;» Abdominal pain/cramps&lt;br&gt;» Vaginal bleeding&lt;br&gt;» History of expulsion of products of conception</td>
<td>» Closed cervix&lt;br&gt;» Uterus smaller than dates&lt;br&gt;» Uterus softer than normal</td>
</tr>
<tr>
<td>Missed miscarriage</td>
<td>(Products of conception not expelled but fetal cardiac activity is absent).&lt;br&gt;» Bleeding may or may not be present</td>
<td>» Closed cervix&lt;br&gt;» Uterus smaller than dates</td>
</tr>
</tbody>
</table>

### 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

Management of miscarriages

» Assess for stability
» Inform diagnosis to couple
» Thoroughly assess for stability for options
» Counsel about treatment options
» Consent
» FBC / hCG Titer / blood grouping & Rh Typing

**EXPECTANT**
» Treat as out-patient
» Inform possible complications
» Follow up after two weeks if no expulsion
» Repeat USG/FBC/clotting profile
» If patient is well, continue management
» Offer surgical management in two to four weeks if no expulsion of POC

**MEDICAL**
» Treat as out-patient/in-patient
» Prescribe
» Misoprostol as per FIGO Recommended Regimen
» Analgesics
» Inform possible complications
» Follow up in two weeks with USG if incomplete expulsion
» if incomplete expulsion, offer re-insertion of drug or surgical intervention

**SURGICAL**
» Elective or Emergency
» Cervical ripening with prostaglandin prior to surgery
» Antibiotic prophylaxis
» Regional short anesthesia
» Evacuation of POC by vacuum aspirator or suction aspirator
» Observe for a minimum 6 hours for complication and discharge

Figure 11: Medical management of miscarriage
### Table 20: Recommended dose and administration of Misoprostol. Adapted from FIGO.

<table>
<thead>
<tr>
<th>MISOPROSTOL-ONLY</th>
<th>RECOMMENDED REGIMENS 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>&lt;13 weeks gestation</strong></td>
<td><strong>13-26 weeks gestation</strong></td>
</tr>
<tr>
<td>Pregnancy termination</td>
<td>Pregnancy termination</td>
</tr>
<tr>
<td>800μg SL every 3 hours</td>
<td>13-24 weeks: 400μg PV/SL/bucc* every 3 hours</td>
</tr>
<tr>
<td>Missed abortion</td>
<td>Fetal death</td>
</tr>
<tr>
<td>800μg PV* every 3 hours (X2)</td>
<td>200μg PV*/SL/bucc every 4-6 hours</td>
</tr>
<tr>
<td>Or 600μg SL every 3 hours (X2)</td>
<td>&gt;28 weeks: 100μg PV/SL/bucc* every 6 hours</td>
</tr>
<tr>
<td>Incomplete abortion</td>
<td>Inevitable abortion</td>
</tr>
<tr>
<td>600μg PO (X1)</td>
<td>200μg PV*/SL/bucc every 6 hours</td>
</tr>
<tr>
<td>Or 400μg SLI (X1) Or 400-800μg PV* (X1)</td>
<td></td>
</tr>
<tr>
<td>Cervical preparation for surgical abortion</td>
<td>Cervical preparation for surgical abortion</td>
</tr>
<tr>
<td>400μg SL 1 hour before procedure</td>
<td>13-19 weeks: 400μg PV 3-4 hours before procedure</td>
</tr>
<tr>
<td>Or PV* 3 hours before procedure</td>
<td>&gt;19 weeks: needs to be combined with other modalities</td>
</tr>
</tbody>
</table>

*PV = Per vaginam

---

800 μg SL every 3 hours (X1)

---

200 μg PV*/SL/bucc every 6 hours (X1)

---

600 μg PO every 2 hours

---

400-800 μg PV*/SL/bucc every 6 hours (X1)

---

25 μg PV* every 6 hours (X1)

---

400 μg SL 1 hour before procedure

---

13-19 weeks: 400μg PV 3-4 hours before procedure

---

>19 weeks: needs to be combined with other modalities
<table>
<thead>
<tr>
<th>Route of administration</th>
<th>Notes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV- vaginal administration</td>
<td>1. If mifepristone is available (preferable), follow the regimen prescribed for mifepristone + misoprostol.</td>
</tr>
<tr>
<td>SL- Sublingual administration</td>
<td>2. Included in the WHO model list of essential medicines</td>
</tr>
<tr>
<td>PO- Oral</td>
<td>3. For incomplete/inevitable abortion women should be treated based on their uterine size rather than menstrual period (LMP) dating</td>
</tr>
<tr>
<td>Bucc- Buccal (in the cheek)</td>
<td>4. Leave to take effect over 1-2 weeks unless excessive bleeding or infection</td>
</tr>
<tr>
<td>Rectal route is not included as recommended route because the pharmacokinetic profile is not associated with best efficacy.</td>
<td>5. An additional dose can be offered if the placenta has not been expelled 30 minutes after fetal expulsion</td>
</tr>
<tr>
<td>*Avoid PV (vaginal route) if bleeding and/or signs of infection</td>
<td>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</td>
</tr>
<tr>
<td></td>
<td>7. Including ruptured membranes where delivery indicated</td>
</tr>
<tr>
<td></td>
<td>8. Follow local protocols if previous cesarean or intrauterine scar</td>
</tr>
<tr>
<td></td>
<td>9. If only 200mg tablets are available, smaller doses can be made by dissolving in water (see <a href="http://www.missopristol.org">www.missopristol.org</a>)</td>
</tr>
<tr>
<td></td>
<td>10. Where oxytocin is not available or storage conditions are inadequate</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Unruptured Ectopic Pregnancy</th>
<th>Ruptured Ectopic Pregnancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>» 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)</td>
<td>» Pallor</td>
</tr>
<tr>
<td>» Abdominal and pelvic pain</td>
<td>» Fast, weak pulse (110 per minute or more)</td>
</tr>
<tr>
<td></td>
<td>» Acute abdominal and pelvic pain</td>
</tr>
<tr>
<td></td>
<td>» Abdominal distension</td>
</tr>
<tr>
<td></td>
<td>» Rebound tenderness</td>
</tr>
<tr>
<td></td>
<td>» Hypotension</td>
</tr>
<tr>
<td></td>
<td>» Hypovolaemia</td>
</tr>
<tr>
<td></td>
<td>» Syncope/Shock</td>
</tr>
</tbody>
</table>

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.
Patient reproductive age present with at least one of the following: positive urine or qualitative beta hCG serum, lower abdominal pain, vaginal bleeding.

Perform history and physical examination assess risk of ectopic pregnancy.

- Patient is stable
- Patient is in any risk group
- Patient is low risk and USG is not immediately not available
- Patient presents in shocks

- Transvaginal pelvic ultrasonography
- Measure beta-hCG level
- Beta-hCG level >1500mIU/mL
- Beta-hCG level <1500mIU/mL

- Repeat beta hCG measurement after 48hrs. Increase of >66% indicates normal pregnancy per mL
- Beta-hCG level >1500mIU/mL per mL and increasing
- Beta-hCG level <1500mIU/mL per mL and decreasing

Monitor patient for signs and symptoms of pain or miscarriage and consider surgical consultation or diagnostic uterine curettage.

Immediate surgical intervention: Laparoscopy or laparotomy as decided.
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

- **Gestational Trophoblastic Disease**
  - Premalignant
    - Hydatidiform mole (Complete and partial)
  - Malignant
    - Choriocarcinoma
    - Placental site trophoblastic tumor
    - Invasive mole

Figuer 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 of 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 titre
d» 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
d» FCB
d» CXR if indicated

3.3.4 Management

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

3.3.5 Follow up

» Follow up after GTD is individualized according to the type of GTD
d» 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)
d» Avoid pregnancy for up to 6 months after hCG levels have normalized
d» 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 an 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

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Findings</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abruptio placentae</td>
<td>- Painful, tender uterus, often tense with contractions</td>
<td>General condition and anemia may not be proportionate to blood loss (concealed abruption)</td>
</tr>
<tr>
<td></td>
<td>- Woody hard.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Bright, dark or clotted blood</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Maternal hypotension</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Signs of fetal distress (CTG abnormalities, decelerations, sinusoidal pattern)</td>
<td></td>
</tr>
<tr>
<td>Placenta previa</td>
<td>- Sudden onset, painless, causeless bleeding</td>
<td>Commonly diagnosed with routine USG</td>
</tr>
<tr>
<td></td>
<td>- Soft, non-tender uterus</td>
<td>General condition and anemia are proportionate to blood loss</td>
</tr>
<tr>
<td></td>
<td>- Floating fetal head in contrast to gestational age</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- 10% do not have bleeding till term</td>
<td></td>
</tr>
<tr>
<td>Vasa previa</td>
<td>- Painless vaginal bleeding with fetal heart abnormalities</td>
<td>Should be considered if bleeding occurs after spontaneous or iatrogenic rupture of the fetal membranes.</td>
</tr>
<tr>
<td></td>
<td>- Suspected based on USG findings</td>
<td></td>
</tr>
<tr>
<td>Uterine rupture</td>
<td>- Severe abdominal pain, tenderness, cessation of contractions with loss of uterine tone</td>
<td>A high clinical suspicion is needed especially in those with history of prior uterine surgery</td>
</tr>
<tr>
<td></td>
<td>- Fetal bradycardia</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- IUD</td>
<td></td>
</tr>
</tbody>
</table>
Algorithm for management of major APH

Call for help!
Senior midwives, experienced obstetricians, anaesthetist. Contact haematologist

Actions
- Lie in left lateral
- Gave high-flow oxygen
- Intravenous access
  - Two large-bore cannulae
  - Take blood samples: FBC, clotting screen, (including fibrinogen) Kleihauer, group and cross-match 4 units
- Rapid fluid replacement
  - Two litres of crystalloid - Hartmann's or 0.9% saline
  - Consider cell salvage if available
- Fetal wellbeing
  - Auscultate fetal heart
  - Ultrasound scan for FH (and placental site)
  - Continuous CTG (if appropriate)

Assessments
- Observations
  - Respiratory rate, pulse, BP, O2 saturations
- Clinical history/cause of bleeding
  - Placenta praevia
  - Abruption
  - Uterine rupture
  - Vasa praevia
- Examination Abdominal -
  - uterine tone, abdominal tenderness/peritonism
  - Vaginal - amount of blood loss, stage of labour
  - (DO NOT perform VE until placenta praevia excluded)
- Monitor blood loss
  - Accurate fluid balance
- Need for blood products (use blood warmer)
  - Consider: O-negative emergency blood, FFP, platelets, cryoprecipitate/fibrinogen concentrate

Stop the bleeding
- Should birth be expedited? (maternal or fetal compromise)
- Expedite birth of baby
- Mode of birth
  - Dependent on placental site, stage of labour and fetal and maternal clinical circumstances
- After birth:
  - • Be aware of significant risk of PPH
  - • Active management of third stage
  - • Commence IV oxytocin infusion after birth (40 units Syntocinon infusion via pump over 4 hours)
- Monitoring
  - Document all observations - use modified obstetric early warning score chart (MOEWS)
  - Urinary catheter and urine measurement
  - Empty bladder, monitor urine output hourly

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

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

![Diagram of 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.

Management of placenta previa

- Examination and clinical assessment
- Resuscitation
- USG for localization of placenta

Active bleeding
- Cesarean section

No active bleeding
- < 37 weeks
- >37 weeks

- Steroid therapy
- Consider Tocolysis
- Close monitoring of mother & fetus
- Repeat USG at term for placental localization
- Plan CS at 38 weeks

Plan CS at 38 weeks

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

Attends with first presentation of reduced fetal movement at >28+0 weeks of gestation

Detailed clinical history including risk factors for stillbirth and Fetal Growth Restriction (FGR)

History confirms DFM

Auscultate with handheld Doppler to exclude Intrauterine Fetal Death (IUFD)

FH not present on auscultation

Immediate USG to exclude/diagnose IUFD

Suspicous or pathological fetal heart rate pattern

Manage as per hospital policy

Abnormality detected on scan

Ultrasound for amniotic fluid volume/abdominal circumference/estimated fetal weight

Normal scan

Perception of FRM resolved and no risk factors for FGR/stillbirth

Continue with RFM or risk factor for FGR/stillbirth

Normal fetal heart rate pattern

Cardiotocograph (CTG) to exclude imminent fetal compromise

Suspicious or pathological fetal heart rate pattern

FH not present on auscultation

IHUF

Offer to auscultate FH Routine antenatal assessment Give advice to consult if further episodes of RFM If unsure about fetal movements, focus on fetal movements for 2 hours If not feeling 10 movements in 2 hours, contact healthcare provider immediately

History does not confirm DFM

If unsure whether fetal movements are reduced, focus on fetal movements for 2 hours If not feeling 10 movements in 2 hours, contact healthcare provider immediately

Figuer 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 misuse
- 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

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

Cervical dilatation ≥5 cms (Plot LCG)

- Monitor frequency, strength and duration of uterine contractions
- Foetal heart
- Cervical dilatation
- Descent of the presenting part

Rate of cervical dilatation >1 cm/hour

Satisfactory progress

Delivery at full dilatation

Cervical dilatation ≤5 cms

If not in active labour, reassess with:
- Pain increases
- PV leaking / bleeding
- Decreased fetal movements

Rate of cervical dilatation <1 cm/hour

Unsatisfactory progress

Intervention / refer to higher center

Foetal distress

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 Labour Care 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

- 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.

Figure 19: Position for birthing and pushing

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 (AMTSOL)

» 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 cutt

» 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

<table>
<thead>
<tr>
<th>Medical</th>
<th>Obstetric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-dated pregnancy</td>
<td>Oligohydramnios</td>
</tr>
<tr>
<td>DM or GDM</td>
<td>Polyhydramnios</td>
</tr>
<tr>
<td>Preeclampsia ≥ 37 weeks</td>
<td>Prolong latent phase</td>
</tr>
<tr>
<td>Gestational hypertension ≥ 38 weeks</td>
<td>PROM</td>
</tr>
<tr>
<td>Postdated (&gt;41+0 weeks), post term (&gt;42+0 weeks)</td>
<td>Stable antepartum hemorrhage</td>
</tr>
<tr>
<td>Oligohydramnios</td>
<td>Congenital fetal anomalies</td>
</tr>
<tr>
<td>Uncomplicated twin pregnancy ≥ 38 weeks</td>
<td>Rh isoimmunization</td>
</tr>
<tr>
<td>Preterm, or pre-labour rupture of membranes</td>
<td>Intrauterine fetal demise</td>
</tr>
<tr>
<td>Intrauterine growth restriction, or Suspected small for gestation age fetus</td>
<td>Chorioamnionitis</td>
</tr>
<tr>
<td>Rh - Isoimmunization</td>
<td>Abnormal CTG or BPP</td>
</tr>
<tr>
<td>Intrahepatic cholestasis of pregnancy</td>
<td></td>
</tr>
</tbody>
</table>
### 5.5.2 Contraindications for induction of labor

<table>
<thead>
<tr>
<th>Maternal:</th>
<th>Fetal:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Placenta praevia, vasa previa</td>
<td>1. Significant Macrosomia (fetal weight more than 4 kg)</td>
</tr>
<tr>
<td>2. Cord presentation</td>
<td>2. Abnormal fetal lie or presentation (Brow, mentoposterior,</td>
</tr>
<tr>
<td>3. Previous 2 caesarean sections</td>
<td>transverse lie)</td>
</tr>
<tr>
<td>4. Prior classical or inverted “T’ uterine incision</td>
<td>3. Non reassuring fetal status</td>
</tr>
<tr>
<td>5. Significant prior uterine surgery eg, full thickness myomectomy with</td>
<td></td>
</tr>
<tr>
<td>breach of uterine cavity.</td>
<td></td>
</tr>
<tr>
<td>6. Active genital herpes</td>
<td></td>
</tr>
<tr>
<td>7. Pelvic structural deformities</td>
<td></td>
</tr>
<tr>
<td>8. Cervical cancer</td>
<td></td>
</tr>
</tbody>
</table>

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

- Favorable cervix with Bishop's score of ≥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

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

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. PGE2

Prostaglandins promotes cervical ripening and stimulate uterine contractions.

Dinoprostone preparation includes:

- Vaginal gel (Prostaglandin E2)
- 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
### 6.1.3 Differential Diagnoses

Table 24: Differential diagnosis of PROM

<table>
<thead>
<tr>
<th>Symptoms and Signs Typically Present</th>
<th>Symptoms and Signs Sometime presents</th>
<th>Probable Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>» Watery vaginal discharge</td>
<td>» Sudden gush or intermittent leaking of fluid</td>
<td></td>
</tr>
<tr>
<td>» Fever/chills pyrexia&gt;38°C</td>
<td>» History of loss of fluid</td>
<td></td>
</tr>
<tr>
<td>» Maternal tachycardia</td>
<td>» Foul-smelling watery discharge after 22 weeks</td>
<td></td>
</tr>
<tr>
<td>» Abdominal pain</td>
<td>» Tender uterus</td>
<td></td>
</tr>
<tr>
<td>» Fetal tachycardia</td>
<td>» Light vaginal bleeding</td>
<td></td>
</tr>
<tr>
<td>» Foul-smelling vaginal discharge</td>
<td>» Leukocytes of &gt;15,000/mm3</td>
<td></td>
</tr>
<tr>
<td>» No history of loss of fluid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>» Bloody vaginal discharge</td>
<td>» Itching</td>
<td></td>
</tr>
<tr>
<td>» Vaginal bleeding</td>
<td>» Frothy/curd-like discharge</td>
<td></td>
</tr>
<tr>
<td>» Intermittent or constant abdominal pain</td>
<td>» Abdominal pain</td>
<td></td>
</tr>
<tr>
<td>» Blood-stained mucus or watery vaginal discharge (show)</td>
<td>» Cervical dilatation and effacement</td>
<td></td>
</tr>
<tr>
<td>» Contractions</td>
<td>» Contraction</td>
<td></td>
</tr>
</tbody>
</table>

- Prelabour rupture of membranes
- Amnionitis
- Vaginitis/cervicitis
- Antepartum hemorrhage, Abruptio placenta
- 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.

| Gestation <37 weeks no signs of infections | » Antibiotics to reduce maternal and neonatal infective morbidity: Erythromycin 250 mg QID OR Amoxicillin 500 mg TDS PO for 7-10 days
| | » 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
| | » If gestational age < 32 weeks and preterm birth is likely within the next 24 hours, consider Magnesium sulfate for neuroprotection.
| | » Arrange in-utero transfer to a higher centre for NICU care in collaboration with pediatrician

| Gestation <37 weeks no signs of infections | » 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
| | » Allow 12-24 hours time from the time of leaking for onset of spontaneous labour before proceeding to IOL.
| | » Conservative management up to 72 hours may be considered at the discretion of the obstetrician
| | » Induce and refer to IOL guideline

| Any gestation with signs of infection | » 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.
| | » Continue treatment for 24–48 hours after the symptoms and signs of infection have subsided.
| | » Deliver by IOL/cesarean section
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

<table>
<thead>
<tr>
<th>Figure</th>
<th>Signs and symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occiput posterior</td>
<td>Occiput posterior position occurs when the fetal occiput is posterior in relation to the maternal pelvis. 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.</td>
</tr>
<tr>
<td>Left occiput posterior</td>
<td>On vaginal examination: The posterior fontanelle is towards the sacrum and the anterior fontanelle may be easily felt if the head is flexed.</td>
</tr>
<tr>
<td>Left occiput transverse</td>
<td>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</td>
</tr>
</tbody>
</table>
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.

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.

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)

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.
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.

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.

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.

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.
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](image)

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 1000 mL 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

<table>
<thead>
<tr>
<th>FOUR Ts</th>
<th>SPECIFIC CAUSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>TONE</td>
<td>Atonic Uterus</td>
</tr>
<tr>
<td>TRAUMA</td>
<td>Lacerations, hematomas, inversion, rupture</td>
</tr>
<tr>
<td>TISSUE</td>
<td>Retained tissues, invasive placenta</td>
</tr>
<tr>
<td>THROMBIN</td>
<td>Coagulopathies</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>ANTENATAL RISK FACTORS</th>
<th>LABOR RISK FACTORS</th>
<th>SURGICAL INTERVENTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Previous history of PPH (Estimated 10% recurrence with subsequent deliveries).</td>
<td>- Prolonged labor (first, second, and/or third stage).</td>
<td>- Operative vaginal delivery.</td>
</tr>
<tr>
<td>- Nulliparity.</td>
<td>- Pre-eclampsia and related disorders</td>
<td>- Cesarean section.</td>
</tr>
<tr>
<td>- Grand multiparity (&gt; 5 deliveries).</td>
<td>- Fetal demise</td>
<td>- Episiotomy.</td>
</tr>
<tr>
<td>- Coagulopathy (congenital or acquired including use of medication such as aspirin or heparin).</td>
<td>- Induction or augmentation of Labor</td>
<td></td>
</tr>
<tr>
<td>- Abnormal placentation</td>
<td>- Use of Magnesium Sulphate.</td>
<td></td>
</tr>
<tr>
<td>- Age &gt; 30 yrs</td>
<td>- Chorioamnionitis.</td>
<td></td>
</tr>
<tr>
<td>- Over distension of the uterus:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Multiple gestation.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Polyhydramnios.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Fetal macrosomia</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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 manueuver)

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.

Active management of third stage of labour
Oxytocin soon after delivery of anterior shoulder, delayed cord cutting, CCT uterine massage

BLOOD LOSS > 500ML, BRISK BLEEDING
BP falling, HR rising and or symptomatic PPH Use team approach

- Bimanual uterine massage
- Oxytocin 20 IU in 500 ml of R L solution at 125 ml per hour via an infusion pump.

Resuscitation:
2 large bore IV, O2 by mask, monitor BP, HR, urine output, CBC, cross match

DETERMINE CAUSES: THE FOUR Ts

Tone: Soft “boggy” uterus
Trauma: Genital tract tear, inversion of uterus
Tissue: Retained placental tissue
Thrombin: Blood not clotting

Figure 33: Flow chart for management of PPH
FLOW CHART: INITIAL MANAGEMENT OF MASSIVE PPH - ORGANIZING THE TEAM:

Helper 1 ......................................................... HEAD
- Check Airway  time............................
- Check BREATHING  time.............................
- Administer OXYGEN  time..........................
- Lie FLAT  time..........................
(Note time of relevant EVENTS, Reassure woman & Partner)

Helper 2 ......................................................... ARM 1
- Check BP & pulse  time..............................
- 16 G Cannula  time..............................
- 4-6 units c-match sent  time...........................
- FBC & CLOTTING sent  time..............................
- kept extra seum sample  time...........................
- FLUIDS RESUSCITATION  time..........................
(initially x 2l crystalloid)
- Fluid............... time..............................
- Fluid............... time..............................
- Blood............... time..............................
- Blood............... time..............................
- Blood............... time..............................

Helper 3 .............................ARM 2
- SYNOTCINON 20 UNT IN RL500ML  Time....................
- METHERGIN 0.2MG IV/IM  Time....................
- PROSTODIN (CARBOPROST) or PGF2a (HEMABATE) 250 MCG IM -rpt after 15mins (maximum x 8 doses- is 2 dose should consider moving to theatre).  Time....................
- MISOPROSTOL 800mcg - 1000mcg PR.  Time....................

NAME: CONSULTANTS:
1st Oncall (Dr. ________________________)
Called time:...........Arrival time:.............
2nd Oncall (Dr. ________________________)
Called time:...........Arrival time:.............
MMO:(Dr. ________________________)
Called time:...........Arrival time:.............
Anesthetist:(Dr. ________________________)
Called time:...........Arrival time:.............

UTERUS
- TONE: is the uterus contracted?  YES: □  NO: □
- TRAUMA: Are there any tears/laceration?  YES: □  NO: □
- TISSUE: Are there any placental bits?/check the placenta.  Complete: □  Incomplete: □
- THROMBIN: Is the blood clotting?  YES □  NO: □
- ATONY persist?  YES: □  NO: □  If YES-Bimanual compression applied:
- SHIFT EARLY TO OPERATING ROOM IF BLEEDING PERSIST.
- TOTAL BLOOD LOSS:............................
- BLEEDING CONTROLLED TIME:......................

Name:.........................  Designation:.........................  Signature:.........................

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

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.

---

**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 haematoma 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.

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*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

<table>
<thead>
<tr>
<th>Class 1</th>
<th>Class 2</th>
<th>Class 3</th>
<th>Class 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>crystalloids 3:1 (3 ml of crystalloid should be used as replacement for every 1 ml blood loss)</td>
<td>crystalloids + Colloids (Up to 2L Crystalloids and 1.5 L of colloids)</td>
<td>Crystalloids + Colloids + PRBC</td>
<td>Crystalloids + Colloids + PRBC</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Blood products</th>
<th>Volume (ml)</th>
<th>Contents</th>
<th>Effect per unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRBC</td>
<td>240</td>
<td>RBC, WBC, and plasma</td>
<td>▲ hematocrit 3%, Hb 1gm/dl</td>
</tr>
<tr>
<td>Platelet</td>
<td>50</td>
<td>RBC, WBC, and plasma</td>
<td>▲ platelet count by 5000-10000/mm3</td>
</tr>
<tr>
<td>FFP</td>
<td>240</td>
<td>Fibrinogen, Antithrombin III, factor V, factor VIII</td>
<td>▲ fibrinogen by 10mg/dl</td>
</tr>
<tr>
<td>Cryoprecipitate</td>
<td>40</td>
<td>Fibrinogen, factor VII and XIII and VW factor</td>
<td>▲ fibrinogen by 10mg/dl</td>
</tr>
</tbody>
</table>

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 UTERUSPPH

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 maybe 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)

8.2.4 Post procedure care

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

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

Signs of placental separation:

» Cord lengthening
» Uterus becomes globular and firmer
» Uterus rises in the abdomen
» Gush of blood
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: <30ml/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

<table>
<thead>
<tr>
<th>Obstetric causes</th>
<th>Incidental causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>» PPH</td>
<td>» Massive thromboembolic event (pulmonary embolism)</td>
</tr>
<tr>
<td>» Eclampsia</td>
<td>» Cardiac cause arrhythmias and failure</td>
</tr>
<tr>
<td>» Amniotic fluid embolism</td>
<td>» Myocardial infarction</td>
</tr>
<tr>
<td>» Uterine rupture</td>
<td>» Cerebrovascular accident</td>
</tr>
<tr>
<td>» Uterine inversion</td>
<td>» Subarachnoid haemorrhage</td>
</tr>
<tr>
<td>» Intra-abdominal bleeding</td>
<td>» Septic and anaphylactic shock</td>
</tr>
<tr>
<td>» Unrecognized genital tract hematomas</td>
<td>» Metabolic and endocrine cause</td>
</tr>
<tr>
<td></td>
<td>» Ruptured hepatic, splenic and aortic aneurism</td>
</tr>
<tr>
<td></td>
<td>» misuse of medication/substance</td>
</tr>
</tbody>
</table>
8.5.3 Management

Prop up the woman on left side if she is >20 weeks pregnant (If available bed cannot be inclined by 15 to 30 degrees push the uterus to the left side manually or place a rolled blanket/pillow under the right hip and lumber area)

Keep the woman's head tilted and lift chin to open airway

Inspect mouth and remove foreign body if present and easily visible

Check the airway, look for chest movements and listen for breath sounds and feel for breath.

If breathing normally, maintain position and give 2-4 liters of oxygen by nasal cannula.

If no pulse is palpable, perform CPR immediately. Chest compressions: ventilation at a ratio of 30:2 (chest compressions just above the mid sternum, compression is carried out quickly and steadily, thrust the sternum as deep as 5-6 cm at the rate of 100 to 120/min

Open 2 IV lines using large gauge cannula and give IV fluids

If woman regains consciousness and starts breathing normally, continue oxygen 2-4 liters via nasal cannula, IV fluids. Continue monitoring vitals

If the woman does not breathe or breathes abnormally, check the carotid pulse quickly (not more than 10 seconds)

If the pulse is palpable, ventilate with bag and mask or by mouth every 5 -6 seconds. Ensure that chest rises visibly. Check carotid pulse every 2 minutes. (more than 10 seconds)

If the pulse is palpable, ventilate with bag and mask or by mouth every 5 -6 seconds. Ensure that chest rises visibly. Check carotid pulse every 2 minutes. (more than 10 seconds)

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

Recognize prolapsed umbilical cord

Call for help

» Relieve pressure on the cord
» Prepare for immediate birth (experienced obstetrician, midwifery nurse, gyne theatre team and pediatrician)
» Secure IV access/take blood samples
» Continuously monitor fetal heart rate

Method to release pressure on the cord

» Manually elevate presenting part Position women
  ◦ Exaggerated Sims position-move women into left lateral position with head down and pillow placed under left hip OR
  ◦ Knee chest position. (see figure 42)
» Consider bladder filling if delay is anticipated and apply a dry pad to try to keep cord inside vagina
» Consider tocolysis with subcutaneous terbutaline 0.25mg

Plan for birth

Emergency transfer to labour ward
Assess and assist birth by quickest means (do not let other measures delay birth)
Urgency depend on fetal heart rate and gestational age (consider category 2 caesarean if FHS is normal)
If CS is necessary- consider regional anaesthesia if possible
Consider delay in cord clamping if infant is uncomplicated
Pediatrician should be present in case of resuscitation is required

Figure 41: Management of cord prolapse

Figure 42 Positions for woman to relieve cord prolapse.

Note: Proper documentation Debrief the couple after delivery

Postnatal
Paired umbilical cord gases
Documentation and clinical risk incident report
Debrief mother and family
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.

8.71 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.

8.72 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 I
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.

**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.

**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

CALL FOR HELP
Midwife coordinator, additional midwifery support, senior obstetrician, pediatric team and anaesthetist

MCROBERTS' MANEUVER
(Thighs to abdomen)

SUPRAPUBIC PRESSURE
(and routine axial traction)

Consider episiotomy if it will make internal maneuvers easier
Try other maneuvers first depending on clinical circumstances and operator experience

DELIVER POSTERIOR ARM

INTERNAL ROTATION MANEUVERS

Inform consultant obstetrician and anaesthetist

If above maneuvers fail to release impacted shoulders, consider
ALL FOURS POSITION (if appropriate)
OR
Repeat all the above again

Consider cleidotomy, Zavanell maneuver or symphysiotomy

DISCOURAGE PUSHING
Lie flat and move buttocks to edge of bed

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

Good attachments

Good attachment

Good position of baby

Poor attachments cross sectional

Poor attachments cross sectional

Poor position of baby

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

Counsel on exclusive breastfeeding during pregnancy and at birth

Initiate breast feeding within half- 1 hour

Good attachment & suckling

Support exclusive breast feeding for 6 months

Baby sick and does not feed

Examine the baby
If baby is well, leave with mother and reassess in 3 hrs or earlier if the baby is small
If the baby still does not feed, refer to specialist

See whether the position and latching are correct
Examine the breast for cracked nipple, engorgement
Refer to Protocol on mastitis

Help mother to express milk into a clean cup and feed with spoon
If mother cannot breast feed at all,
Get a relative to breast feed
Formula feed Infant formula

Mother well

Mother ill

Baby well

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

**History**
- Time since delivery
- Breast feeding or not
- Duration of fever and Breast pain

**Examination**
- Temperature
- Nipple sore or fissured
- Both breasts/only one breast affected
- Hard enlarged breasts
- Fluctuant swelling in breast, overlying erythema

**Cracked nipple**
- Teach correct positioning and attachment (see breast feeding protocol)
- Encourage to continue breast feeding
- Reassess after 2 feeds, if not better teach mother to express milk from affected breast and feed by cup/spoon
- Continue feeding on healthy side

**Breast engorgement**
- Teach correct positioning and attachment
- Encourage the mother to continue breast feeding
- Advise relief measures before feeding
- Advise to feed more frequently
- Relief measures to be followed after feeding
- Reassess after 2 feeds
- If not better, teach mother how to express milk before feeding to relieve discomfort

**Mastitis or abscess**
- Give erythromycin 250 mg / cloxacillin 500mg 6 hourly by mouth and refer to specialist
- If severe pain, give paracetamol

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 as 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 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 need 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

» Apqar score
» Breathing, grunting or gasping, other signs of respiratory distress (nasal flaring, retractions)
» Heart rate, and auscultation for murmurs
» Any dismorphic 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

<table>
<thead>
<tr>
<th>INDICATOR</th>
<th>0 point</th>
<th>1 point</th>
<th>2 points</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (Activity (Muscle tone))</td>
<td>Absent</td>
<td>Flexed arms and legs</td>
<td>Active</td>
</tr>
<tr>
<td>P (Pulse)</td>
<td>Absent</td>
<td>Absent 100bpm</td>
<td>Over 100bpm</td>
</tr>
<tr>
<td>G (Grimace)</td>
<td>Floppy</td>
<td>Minimal response to stimulation</td>
<td>Prompt response to stimulation</td>
</tr>
<tr>
<td>A (Appearance)</td>
<td>Blue, pale</td>
<td>Pink body, blue extremities</td>
<td>Pink</td>
</tr>
<tr>
<td>R (Respiration)</td>
<td>Absent</td>
<td>Slow and irregular</td>
<td>Vigorous cry</td>
</tr>
</tbody>
</table>

9.4.7 Delayed in cord clamping

Umbilical cord clamping must be delayed for at least 1-3 minutes 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 administrated to all babies (0.5mg for all babies less than 1000 grams 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 newborn at birth

Prepare room for receiving the newborn
Have trained health professionals for receiving the baby

Deliver the baby on mother’s abdomen
Dry, stimulate and wrap baby

Baby breathing

Delay cord cutting to 1-3 minutes
Clamp the cord
Do an assessment of newborn
Check the baby’s breathing and colour
Continue skin to skin care
Provide warmth
Check the cord for bleeding
Initiate breast feeding
Record weight and height
Administer IM vitamin K
Other vaccines as per protocol mentioned above (BCG, Hepatitis B)

Baby NOT breathing

Clamp and cut the cord immediately and transfer to resuscitation area
Follow resuscitation protocol
If need, transfer to higher center

Figure 50: Care of newborn at birth
9.5 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. SpO2 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 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°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

<table>
<thead>
<tr>
<th>Target preductal SpO2 after birth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1min</td>
</tr>
<tr>
<td>2min</td>
</tr>
<tr>
<td>3min</td>
</tr>
<tr>
<td>4min</td>
</tr>
<tr>
<td>5min</td>
</tr>
<tr>
<td>10min</td>
</tr>
</tbody>
</table>
C. Circulation

» Give chest compressions if the heart rate is < 60/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 neede, to maintain on the target SpO2 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

<table>
<thead>
<tr>
<th>Correct head position to open up airway and for bag ventilation. Do not hyperextend the neck</th>
<th>Correct position of hands for cardiac massage of a neonate. The thumbs are used for compression over the sternum</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Image]</td>
<td>[Image]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Neonatal self-inflating resuscitation bag with round mask</th>
<th>Fitting mask over face</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Image]</td>
<td>[Image]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Correct head position to open up airway and for bag ventilation. Do not hyperextend the neck</th>
<th>Correct position of hands for cardiac massage of a neonate. The thumbs are used for compression over the sternum</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Image]</td>
<td>[Image]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>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</th>
<th>If you hear air escaping from the mask, form a better seal. The commonest leak is between the nose and the cheeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Image]</td>
<td>[Image]</td>
</tr>
</tbody>
</table>
9.6.4 Neonatal Resuscitation Algorithm

Antenatal counseling
Team briefing and equipment check

Birth

Term gestation?
Good tone?
Breathing or crying?

Yes → Infant stays with mother for routine care: warm and maintain normal temperature, position airway, clear secretions. If needed dry. Ongoing evaluation

No → Warm and maintain normal temperature, position airway, clear secretions. If needed dry, stimulate

Apnea or gasping?
HR below 100/min?

Yes → PPV, SpO2 monitor
Consider ECG monitor

No → Labored breathing or persistent cyanosis?

Yes → Position and clear airway SpO2 monitor
Supplementary O2 as needed consider CPAP

No → Postresuscitation care
Team debriefing

HR below 100/min

Yes → Check chest movements
Ventilation corrective steps. If needed ETT or laryngeal mask

No → Intubate if not already done. Chest compression.
Coordinate with PPV 100% O2
ECG monitor
Consider emergency UVC

HR below 100/min

Yes → IV Epinephrine if HR persistently below 60/min. Consider hypovolemia
Consider pneumothorax.

No → Targeted preductal SPO2 after birth

<table>
<thead>
<tr>
<th>Time (min)</th>
<th>SPO2 Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>60%-65%</td>
</tr>
<tr>
<td>2</td>
<td>65%-70%</td>
</tr>
<tr>
<td>3</td>
<td>70%-75%</td>
</tr>
<tr>
<td>4</td>
<td>75%-80%</td>
</tr>
<tr>
<td>5</td>
<td>80%-85%</td>
</tr>
<tr>
<td>10</td>
<td>85%-95%</td>
</tr>
</tbody>
</table>

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
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

<table>
<thead>
<tr>
<th>Zygosity</th>
<th>Refers to whether the twins arose from one (monozygous) or from two fertilized eggs (dizygous)1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amnionicity</td>
<td>Refers to the number of outer membranes that surround the fetus in a multiple pregnancy and corresponding placentation (i.e. monochorionic or dichorionic);</td>
</tr>
<tr>
<td>Monochorionic</td>
<td>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)</td>
</tr>
<tr>
<td>Monochorionic</td>
<td>Monoamniotic twins (MC/MA) Have no separating membrane</td>
</tr>
<tr>
<td>Diamniotic twins</td>
<td>Have a separating membrane consisting of amnion only (two layers)</td>
</tr>
<tr>
<td>(MC/DA)</td>
<td></td>
</tr>
<tr>
<td>Diamniotic twins</td>
<td></td>
</tr>
<tr>
<td>(DC/DA)</td>
<td></td>
</tr>
</tbody>
</table>

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

**Management of twin labour**

- Analgesia
- Careful fetal monitoring
- To run an infusion drip
- Conduct delivery of 1st baby as usual

- Deliver the first baby vaginally

- Cord is divided in between two clamps
  - No Mathergin

- Note the lie of the second baby clinically and or by USG

- Transverse lie
  - Internal podalic version
    - If fails: Emergency CS
  - Spontaneous / instrumental

- Longitudinal lie
  - Cephalic
  - Breech
    - Breech extraction

**Figure 53: Management of twin labour**
References

1. Neonatal, pediatric resuscitation guidelines, American Academy of Pediatrics 2020
2. New WHO guidelines on postnatal care – a toolbox to provide quality care to women and their newborns, WHO
5. UNICEF. (2018). Facility Based Care of Sick Neonates at referral health facility, training manual, UNICEF
11. Clinical Protocols in Obstetrics and Gynecology for Malaysian Hospitals – Prof Dato Dr Sivalingam Nallaih and Prof Dato Dr Sachithanantham
14. The hypertensive disorders of pregnancy: ISSHP classification, diagnosis & management recommendations for international practice,2018
18. Drug treatment for severe hypertension in pregnancy, WHO, 2018
19. WHO recommendation on calcium supplementation before pregnancy for the prevention of pre-eclampsia and its complications, WHO, 2020
20. Pregnancy and Heart Disease, ACOG, PB Number 212, May 2019
22. Family Planning - A global handbook for providers, WHO, 2018
24. The pocket doctor - Obstetrics and Gynecology, Richa Saxena
25. WHO recommendation for Induction of labor.


31. FIGO – Misoprostol only recommendation regimen - 2017
Role of Reproductive health Center when a high risk is confirmed

All high-risk condition should be notified to HPA

Call, SMS or Viber the details of the pregnant women to
• HPA RH unit phone number 3014495

Age:
Name:
Address:
Obstetric history
Gestational Age:
Gravida:
Name and Phone number of guardians:
Responsible person from health facility:
• Send the detailed report of the pregnant women according to the ANC and PNC report of the HPA (rh. unit@health.gov.mv)

• Refer to table below

Pregnant women who have the following condition should be notified as High-risk pregnancy

Focus to be given to these topics when providing Health education for high risk and vulnerable
• Importance of a support system
• Potential complication during pregnancy
• Delivery plan and after care
• Family planning
• Sexually transmitted infections / personal hygiene
• Educational continuity (if she's a school student)
• Mental health
• Starting a family or a relationship
• Problem solving and decision-making skills
• Financial management
• Identification of needs

Find below the list of topics to be highlighted when providing health education for all pregnant women

• Refer to table below

Ensure Support and follow up
• Provide psychosocial support
• Conduct follow up till postnatal care
• Facilitate at least one planning visit to health facility by health worker
• Home visit

Health care provides to get support from:
• Gender Ministry (Family Protection Unit)
• Hospitals
• Schools
• NGOs
• Police
<table>
<thead>
<tr>
<th>High Risk Category:</th>
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<tbody>
<tr>
<td>Age &lt; 19 years or &gt;40 years</td>
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<tr>
<td>Age &gt; 40 years at first pregnancy</td>
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<tr>
<td>Grand Multipara &gt;5</td>
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<tr>
<td>Short stature &lt;145cm</td>
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<tr>
<td>Previous Caesareans/uterine scars - Previous Caesareans:</td>
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<tr>
<td>1 □ 2 □ 3 □ 4 □</td>
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<tr>
<td>- Myomectomy □ Cavity breached, Yes ☑ No □</td>
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<tr>
<td>Documents not available □</td>
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<tr>
<td>Bad Obstetric history scars</td>
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<tr>
<td>Previous neonatal demise or stillbirths</td>
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<tr>
<td>History of Recurrent Abortions (equal to or more than 3)</td>
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<td>Preterm deliveries</td>
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<td>Fetal anomalies</td>
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<td>Twin / Multiple Pregnancy</td>
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<td>Rh negative</td>
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<td>Obesity</td>
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<td>BMI &gt; 30kg/m2</td>
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<tr>
<td>Anemia</td>
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<td>IDA</td>
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<td>Others (specify):</td>
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<td>Diabetes</td>
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<td>Hypertension:</td>
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<td>Preeclampsia:</td>
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<td>Others (specify):</td>
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<td>CHD:</td>
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<td>Others (specify):</td>
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<td>Autoimmune Diseases</td>
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<tr>
<td>STIs / Genital warts</td>
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<tr>
<td>Group B Streptococcus</td>
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<tr>
<td>Substance Use Disorder (SUD)</td>
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<td>Mental health disorder</td>
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<tr>
<td>Rape victim</td>
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<tr>
<td>victim of Gender based violence</td>
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<tr>
<td>women who engage in Sex work</td>
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<tr>
<td>multiple sexual partners</td>
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<tr>
<td>Adolescents whose parents are involved in criminal activities</td>
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</tbody>
</table>
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
   Communicable Disease Notifying Form

» 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

ANTENATAL RECORD-CLIENT CARD

NAME: NIC NO:
AGE: NCHSS/Cohort No:
Residential address: TEL NO:
Complicated: YES/NO

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DELIVERY PLAN

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COMPLETE THIS FOR EVERY PREGNANT WOMAN UPON REGISTRATION IN A HEALTH FACILITY-ALL HEALTH FACILITIES AND PRIVATE CLINICS SHOULD COMPLETE THIS FORM
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<th>B.P</th>
<th>Oedema</th>
<th>Fundal Height</th>
<th>Pres.</th>
<th>USG</th>
<th>Next Visit</th>
<th>Service provided by</th>
<th>Advice / Remarks</th>
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**Obstetric History**

- **Allergy:**
- **Height:**
- **Blood Group RH:**
- **Menstrual history:**
- **Family History:**
- **CVS:**
- **RBS:**
- **LMP:**
- **Thalassemia carrier:**
- **USG EDD:**
- **Medical History:**
- **Breast:**
- **RISK FACTOR:**
  - **Varicose Veins:**
  - **Surgical History:**
  - **Toxoid:**

**Date**

- **Date C/O Wt B.P Oedema Fundal Height Pres. FHS HB Urine Alb. Sug. USG Next Visit Service provided by Advice / Remarks**

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<th>Alb. Sug.</th>
<th>USG</th>
<th>Next Visit</th>
<th>Service provided by</th>
<th>Advice / Remarks</th>
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<th>FHS</th>
<th>HB</th>
<th>Alb. Sug.</th>
<th>USG</th>
<th>Next Visit</th>
<th>Service provided by</th>
<th>Advice / Remarks</th>
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POST-NATAL RECORD

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<th>Date:</th>
<th>1st VISIT</th>
<th>2nd VISIT</th>
<th>3rd VISIT</th>
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<td>Complaints</td>
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<td>Episiotomy</td>
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<td>P/V bleeding</td>
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<td>Breast Examination</td>
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<td>F.P Advice</td>
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<td>Next Visit</td>
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<td>Remarks</td>
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1st Visit 2nd Visit 3rd Visit

F.P Advice

Remarks

Date: NCHSS / COHORT No: Date of Delivery: Birth Weight: Complicated: YES/NO

Name: P L A

Age: Type of Delivery: Indication: Sex:

Address: Contact No:

NIC No: NCHSS / COHORT No:

Complaints

1st Visit 2nd Visit 3rd Visit

F.P Advice

Remarks

Date: NCHSS / COHORT No: Date of Delivery: Birth Weight: Complicated: YES/NO

Name: P L A

Age: Type of Delivery: Indication: Sex:

Address: Contact No:

NIC No: NCHSS / COHORT No:

Complaints

1st Visit 2nd Visit 3rd Visit

F.P Advice

Remarks

Date: NCHSS / COHORT No: Date of Delivery: Birth Weight: Complicated: YES/NO

Name: P L A

Age: Type of Delivery: Indication: Sex:

Address: Contact No:

NIC No: NCHSS / COHORT No:

Complaints

1st Visit 2nd Visit 3rd Visit

F.P Advice

Remarks
# Communicable Disease Notifying Form

**Appendix 2**

**Communicable Disease Notifying Form**

**Health Protection Agency**  
Male', Republic of Maldives  
\( V8 - Oct - 2019 \)

### Reporting Facility

<table>
<thead>
<tr>
<th>Reporting Facility</th>
<th>Re-notification (required for changes in diagnosis (e.g. Dengue Fever to DHF), case confirmation or outcome (e.g. death).)</th>
</tr>
</thead>
</table>

### Notifiable Diseases

- Immediately notifiable via form and Telephoneapeut (`+960 3014496/contact HPA surveillance focal point)
- Notifiable within 24 hrs. to HPA via email (survillancereporter@shpa.gov.mv) or fax (`+9603014484)

- **Disease**  
  - AEFI  
  - Acute Flaccid Paralysis (use Polio investigation form)  
  - Cholera  
  - Diphtheria  
  - Encephalitis (specify organism if known)  
  - Food Poisoning (use investigation form)  
  - Measles (complete measles investigation form)  
  - Meningitis (specify organism if known)  
  - Mumps  
  - MERS (Middle East Respiratory Syndrome)  
  - Pertussis/whooping cough (use investigation form)  
  - Rabies  
  - Rubella/Congenital Rubella Syndrome (use investigation form)  
  - Shigella  
  - Tetanus / & Neonatal tetanus  
  - Tuberculosis (use TB investigation form)  
  - Yellow Fever  
  - Chikungunya & Zika (complete investigation form)  
  - DF/EDHF/EDSS  
  - GBS (Guillain–Barré syndrome)  
  - Hepatitis A / B / C / D / E (circle as appropriate)  
  - Lymphatic Filariasis  
  - Leprosy  
  - Leptospirosis  
  - Malaria  
  - Plague  
  - Pyrexia of unknown origin (PUO) Pneumonia with cause  
  - SARI (Severe Acute Respiratory Infection = ARI requiring hospital admission)  
  - Scurb Typhus  
  - STIs – Gonorrhea/Chlamydia/Genital warts/Genital Herpes (Circle as appropriate)  
  - Syphillis / & Congenital Syphillis  
  - Typhoid/ & Paratyphoid (complete case investigation form)  
  - Toxoplasmosis/ & Congenital toxoplasmosis  
  - Others (specify)  

### Case Details

1. **Case classification:** (as per surveillance case definition)
   - Suspict
   - Probable
   - Confirmed
2. **Patient National ID No:**  
   - A_________________  
   - For foreigners include passport number
3. **Patient Name:**
4. **Age:** YY / MM
5. **Sex:** M  
   - F  
   - If pregnant
6. **Patient’s residential Address with Atoll/Island (Usual address of residence):**
7. **Patient’s permanent Address with Atoll/Island:**
8. **Contact number:**
9. **Nationality:**
   - Country of origin
10. **Date of onset of illness:** DD / MM / YYYY
11. **Date of consultation:** DD / MM / YYYY
12. **Case outcome:**
   - Death
   - On treatment
   - Referred to higher center
   - Recovered with disability
   - Recovered fully
13. **Recent travel history** (Include countries/islands visited)
14. **Dates of travel**
15. **Clinical details** (Include risk factors, mode of transmission, etc.)
16. **Condition of patient:**
   - Stable
   - Sick
   - Critically ill
17. **Laboratory Confirmation:**
   - Confirmed: Test specifics
   - If Requested, Date: DD / MM / YYYY
   - Not Requested
18. **Notify details:**  
   - (E.g.: Dr, Nurse, HW or another designated person)
   - Name: ___________________  
   - Designation: ____________
   - Contact number: _______________
   - Signature: _______________  
   - Date: DD / MM / YYYY

---

**Data entry use (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: ___________________________________________ Date ______________________

Midwife: ___________________________ ID no. /Hospital no: __________________________

<table>
<thead>
<tr>
<th>Hour</th>
<th>Time</th>
<th>MagSO4 dose and route</th>
<th>REFLEX-ES PRESENT YES/NO (circle one) If absent DO NOT GIVE MgSO4</th>
<th>BP</th>
<th>RR If &lt;16/min DO NOT GIVE MgSO4</th>
<th>SPO2</th>
<th>Patellar reflex</th>
<th>URINE OUTPUT If &lt;30ml/hr DO NOT GIVE MgSO4</th>
<th>CONVULSIONS YES/NO (circle one)</th>
<th>OTHER DRUGS Given</th>
<th>Sign</th>
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</tbody>
</table>

Initial BP__/__ Initial Urine protein ____
Appendix 4

Blood Sugar Profile in Gestational Diabetes / Pregestational Diabetes

Pre meal – 95 mg/dl (≤5.3mmol/l)
1Hour post meal – 140 mg/dl (≤7.8mmol/l)
2Hour post meal – 120 mg/dl (≤6.7mmol/l)

<table>
<thead>
<tr>
<th>Date</th>
<th>FBS / Post Breakfast</th>
<th>Pre / Post Lunch</th>
<th>Pre / Post Dinner</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Date</th>
<th>Duration</th>
<th>Tick (√) in the box when movement of the fetus is felt</th>
<th>Time 10 kicks are felt</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>
Appendix 6
Neonatal death reporting form

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
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.

Perinatal death - deaths that occur as a still birth or in the early neonatal period (<7 days of age)
Neonatal death - 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

2. Mother’s Details

   Name
   Address
   Age
   Date of birth
   Hospital / HC No.
   Admission No.
   ANC Registration No (Hospital / HC)
   Registration No. (island)

Please fill as applicable
Even if mother is not admitted get the ANC information

3. BABY’S DETAILS

   Name (if given)
   Type of Death
   Still Birth
   Neonatal Death
   Hospital / HC No.
   Admission No.
   Gestational age at birth (weeks)
   Date of birth
   Birth weight (grams)
   Time of birth
   (am/pm)
   Sex
   Male
   Female
   Ambiguous
   Date of death
   Time of death
   (am/pm)
   If multiple pregnancy
   Number of babies born

170
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

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

Fetal abruption Trauma Undetermined

Was hypertension present? Yes No

If ‘Yes’ (Tick as applicable)

Essential hypertension Chronic+Superimposed pre-eclampsia

Pre-Eclampsia Eclampsia

Other hypertension Specify:

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
<table>
<thead>
<tr>
<th>Was there rupture of membranes more than 12 hours prior to onset of labour?</th>
<th>Yes</th>
<th>No</th>
<th>Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Were there cord complications?</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td><strong>If 'Yes' describe</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Was chorioamnionitis present?</td>
<td>Yes</td>
<td>No</td>
<td>Unknown</td>
</tr>
<tr>
<td><strong>If 'Yes' diagnosis was:</strong></td>
<td>Pathological</td>
<td>Clinical</td>
<td></td>
</tr>
<tr>
<td><strong>If pathological:</strong></td>
<td>Group B Streptococcus</td>
<td>Other bacterial</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>Specify:</td>
<td></td>
</tr>
<tr>
<td>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]</td>
<td>Initial care</td>
<td>Subsequent care</td>
<td>Referral</td>
</tr>
<tr>
<td>Tertiary hospital</td>
<td>Tertiary hospital</td>
<td>Tertiary hospital</td>
<td></td>
</tr>
<tr>
<td>Private hospital</td>
<td>Private hospital</td>
<td>Private hospital</td>
<td></td>
</tr>
<tr>
<td>Regional hospital</td>
<td>Regional hospital</td>
<td>Regional hospital</td>
<td></td>
</tr>
<tr>
<td>Atoll hospital</td>
<td>Atoll hospital</td>
<td>Atoll hospital</td>
<td></td>
</tr>
<tr>
<td>Health centre</td>
<td>Health centre</td>
<td>Health centre</td>
<td></td>
</tr>
<tr>
<td>Health post</td>
<td>Health post</td>
<td>Health post</td>
<td></td>
</tr>
<tr>
<td>Home</td>
<td>Home</td>
<td>Home</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>Other</td>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>Specify:</td>
<td>Specify:</td>
<td>Specify:</td>
<td></td>
</tr>
<tr>
<td>Onset of labour</td>
<td>Spontaneous</td>
<td>Induced</td>
<td>No labour</td>
</tr>
<tr>
<td>Mode of delivery</td>
<td>Spontaneous vaginal</td>
<td>Breech extraction</td>
<td>Assisted vaginal</td>
</tr>
<tr>
<td>Instrumental</td>
<td>Forceps</td>
<td>Caesarean Section</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vacuum</td>
<td>Emergency</td>
<td>Elective</td>
</tr>
<tr>
<td>Presentation</td>
<td>Vertex</td>
<td>Breech</td>
<td>Cord</td>
</tr>
<tr>
<td>Specify:</td>
<td>Oligohydramnios</td>
<td>Polyhydramnios</td>
<td>Others</td>
</tr>
<tr>
<td>Specify:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Was there (tick as applicable)</td>
<td>Oligohydramnios</td>
<td>Polyhydramnios</td>
<td>Others</td>
</tr>
<tr>
<td>Specify:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Who conducted the delivery?</td>
<td>Nurse</td>
<td>Nurse midwife</td>
<td>Medical officer</td>
</tr>
<tr>
<td></td>
<td>Obstetrician</td>
<td>TRA(Foolhuma)</td>
<td>CHW/FHW</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>Specify:</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 5.2 Postnatal details

**Apgar Scores**  
(See instruction)  

<table>
<thead>
<tr>
<th>1 min</th>
<th>5 min</th>
<th>10 min</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

**Was the liquor meconium stained?**  
If ‘Yes’ was the baby  
- Vigorous  
- Floppy

**Was cord blood gas done?**

- Yes  
- No

If ‘Yes’ was the baby  

<table>
<thead>
<tr>
<th>pH</th>
<th>PCO2</th>
<th>PACO2</th>
<th>Base Excess</th>
<th>Bicarbonate</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
</tbody>
</table>

**Was neonatal resuscitation required?**  
Yes  
No

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

If ‘Yes’ specify (tick as applicable)

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Duration</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endotracheal tube suction</td>
<td>Min.</td>
<td></td>
</tr>
<tr>
<td>Bag and mask ventilation</td>
<td>Min.</td>
<td></td>
</tr>
<tr>
<td>Bag and tube ventilation</td>
<td>Min.</td>
<td></td>
</tr>
<tr>
<td>External cardiac massage</td>
<td>Min.</td>
<td></td>
</tr>
</tbody>
</table>

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

If ‘Yes’

<table>
<thead>
<tr>
<th>Type of assisted ventilation (apart from resuscitation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPAP</td>
</tr>
<tr>
<td>PPV</td>
</tr>
<tr>
<td>Other</td>
</tr>
</tbody>
</table>

Specify:

**Was any procedure performed?**

Yes  
No

**Procedures performed if any**

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partial exchange transfusion</td>
<td></td>
</tr>
<tr>
<td>Total blood exchange transfusion</td>
<td></td>
</tr>
<tr>
<td>Intercostal drainage</td>
<td></td>
</tr>
<tr>
<td>Aspiration</td>
<td></td>
</tr>
<tr>
<td>Central venous / arterial line insertion</td>
<td></td>
</tr>
<tr>
<td>Others (specify)</td>
<td></td>
</tr>
</tbody>
</table>

**Was any surgery performed?**  
Yes  
No

If ‘Yes’

Specify:

**Nutrition/feeding during hospital stay**

<table>
<thead>
<tr>
<th>Feeding Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breastfeeding</td>
</tr>
<tr>
<td>Tube feeding</td>
</tr>
<tr>
<td>Spoon/ cup feeding</td>
</tr>
<tr>
<td>Parenteral</td>
</tr>
</tbody>
</table>
### 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:**

<table>
<thead>
<tr>
<th>Head circumference</th>
<th>cm</th>
<th>Others Specify</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crown heel length</td>
<td>cm</td>
<td></td>
</tr>
</tbody>
</table>

**Was there intra uterine growth restriction (IUGR)?**
- [ ] Yes
- [ ] No

*See growth percentile chart in reference information*

**If 'Yes' (tick as applicable):**
- [ ] Symmetric (formula)
- [ ] Asymmetric (formula)

**Most probable cause of IUGR**
- [ ] Idiopathic
- [ ] Placental pathology
- [ ] Intrauterine infections
- [ ] Nutritional
- [ ] Maternal medical problems Specify:
- [ ] Others Specify:

**Disorders of size**
- [ ] SGA (Small for gestational age - <10th percentile)
- [ ] LGA (Large for gestational age - > 90th percentile)

**Birth/ genetic defects if any**

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<tr>
<th>Specify</th>
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</tbody>
</table>

**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:*

**Specify**

<table>
<thead>
<tr>
<th>Specify</th>
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<tbody>
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</tbody>
</table>

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### 7. DETAILS ON NEONATAL DEATHS

#### 7. 1 Condition at admission (reporting health facility)

<table>
<thead>
<tr>
<th>Brought dead</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

If 'Yes' was there any indication of abuse?

If 'Yes' describe

<table>
<thead>
<tr>
<th>Vitals (Record)</th>
<th>RR</th>
<th>HR</th>
<th>BP</th>
<th>Temp</th>
<th>SpO&lt;sub&gt;2&lt;/sub&gt;</th>
</tr>
</thead>
</table>

Was brought with O2?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

Was assisted ventilation required during transportation?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

If ‘Yes’

- Bag and mask
- Bag and tube

No. of hours of assisted ventilation ___ hrs

#### 7. 2 Condition during admission (reporting health facility)

<table>
<thead>
<tr>
<th>Morbidity conditions if any (Refer instructions)</th>
<th>Respiratory</th>
<th>Cardiovascular</th>
<th>CNS</th>
<th>Haematological</th>
<th>GIT</th>
<th>Infections</th>
<th>Metabolic/Endocrine</th>
<th>Eyes</th>
<th>Other(s)</th>
</tr>
</thead>
</table>

Was there any morbidity during admission?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

If ‘Yes’ (tick and specify as applicable):

Specify

Was surfactant given?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

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?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

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 thuleem)
- 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?

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

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/SIGNIFICANT INFORMATION REGARDING DEATH

State here:

REFERENCE INFORMATION FOR USERS

APGAR Scoring

<table>
<thead>
<tr>
<th>Sign</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart Rate</td>
<td>Absent</td>
<td>Slow &lt;100</td>
<td>&gt;100</td>
</tr>
<tr>
<td>Respiratory Effort</td>
<td>Absent</td>
<td>Irregular, slow, weak cry</td>
<td>Good, strong cry</td>
</tr>
<tr>
<td>Muscle Tone</td>
<td>Limp</td>
<td>Some flexion of extremities</td>
<td>Well flexed</td>
</tr>
<tr>
<td>Reflex Irritability</td>
<td>No response</td>
<td>Grimace</td>
<td>Cry, sneeze</td>
</tr>
<tr>
<td>Colour</td>
<td>Blue, Pale</td>
<td>Body pink, extremities blue</td>
<td>Completely pink</td>
</tr>
</tbody>
</table>

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 10th and 90th percentile
- Large for gestational age (LGA): Weight above 90th percentile
- Small for gestational age (SGA): Weight below 10th percentile
### Details on birth defects

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

### Details on morbidity conditions

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

### List of maternal medications

<table>
<thead>
<tr>
<th><strong>Pethidine</strong></th>
<th><strong>Anti-convulsants</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Morphine</strong></td>
<td><strong>Insulin</strong></td>
</tr>
<tr>
<td><strong>MgSO4</strong></td>
<td><strong>Anti-hypertensives</strong></td>
</tr>
<tr>
<td><strong>Diazepam</strong></td>
<td><strong>Thyroid medications</strong></td>
</tr>
<tr>
<td><strong>Steriods</strong></td>
<td></td>
</tr>
</tbody>
</table>
## Appendix 7
### labour care guide

### WHO LABOUR CARE GUIDE

<table>
<thead>
<tr>
<th>Name</th>
<th>Parity</th>
<th>Labour onset</th>
<th>Active labour diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ruptured membranes (Date)</td>
<td>Time</td>
<td>Risk factors</td>
<td></td>
</tr>
</tbody>
</table>

### ASSESSMENT

**Baseline FHR**
- C <110, ≥160
- Deceleration: L

**Amniotic fluid**
- M++, B

**Fetal position**
- P, T

**Caput**
- +++

**Moulding**
- +++

**Contractions**
- ≤2, >5 per 10 min
- Duration of contractions: <20, >60

**Cervix**

<table>
<thead>
<tr>
<th>Plot X</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
</tr>
<tr>
<td>9, ≥2h</td>
</tr>
<tr>
<td>8, ≥2.5h</td>
</tr>
<tr>
<td>7, ≥3h</td>
</tr>
<tr>
<td>6, ≥5h</td>
</tr>
<tr>
<td>5, ≥6h</td>
</tr>
</tbody>
</table>

**Descent**

<table>
<thead>
<tr>
<th>Plot O</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
</tbody>
</table>

**Oxytocin (U/L, drops/min)**

**Medication**

- IV fluids
- Pain relief
- Oral fluid
- Posture: SP

**Pulse**
- <60, ≥120

**Systolic BP**
- <80, ≥140

**Diastolic BP**
- ≥90

**Temperature**
- ºC <35.0, ≥37.5

**Urine**
- F++, A++

**Labour progress**

**Shared decision making**

**Plan**

### Instructions:
- Circle any observation meeting the criteria in the 'Alert' column. Alert the senior midwife or doctor and record the assessment and action taken.
- If labour extends beyond 12h, please continue on a new labour care guide.

### Abbreviations:

© World Health Organization, 2021. Some rights reserved. Licence (CC BY-NC-SA 3.0 IGO). The WHO Labour Care guide should be used in conjunction with the user’s manual. Responsibility for the interpretation and use of the material lies with the reader. In no event shall the WHO be liable for damages arising from its use.
MATERNAL DEATH NOTIFICATION FORM

Maternal and Perinatal Morbidity and Mortality Review Committee

Ministry of Health and Family

Maldives

March 2010
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.

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 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: ___________________________

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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…………………………….

<table>
<thead>
<tr>
<th>On admission</th>
<th>Miscarriage / ectopic</th>
<th>Antenatal</th>
<th>Intrapartum</th>
<th>Postpartum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condition on admission</td>
<td>Stable</td>
<td>Critically ill</td>
<td>Dead on arrival</td>
<td>Other- specify</td>
</tr>
</tbody>
</table>

| Diagnosis at moment of death | Miscarriage | Ectopic pregnancy | Not in labour | In labour | Postpartum |

Reasons for admission........................................................................................................................................
...........................................................................................................................................................................
...........................................................................................................................................................................
...........................................................................................................................................................................
...........................................................................................................................................................................

Referral from another centre? Y……………N…………………If “Y” from:........................................................................

4. ANTENATAL CARE

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

If “Y” at what locality:  

<table>
<thead>
<tr>
<th>Health centre</th>
<th>Atoll Hospital</th>
<th>Regional Hospital</th>
<th>Tertiary Hospital</th>
<th>PVT Clinic</th>
</tr>
</thead>
</table>

Was the gestational age at booking <20 wks? Y………………… No………………… Total number of visits............

Antenatal Risk Factors

<table>
<thead>
<tr>
<th>Risk</th>
<th>Y</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Past Medical History</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypertension</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proteinuria</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glycosuria</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anememia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abnormal lie</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Previous / Section</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Comments on antenatal complications and management- List any medication (if block insufficient, use an extra sheet of paper)

…………………………………………………………………………………………………………………………………………………………….
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…………………………………………………………………………………………………………………………………………………………….
…………………………………………………………………………………………………………………………………………………………….

5. DELIVERY, PUEPERIUM AND NEONATAL INFORMATION

Did labour occur: Y □ N □ If “Y” was a partogram used? Y □ N □

Labour: short Normal Prolonged CPD present

Delivery (tick appropriate box)

Undelivered Vaginal (unassisted) Vaginal Vaccum / forceps Caesarean section

Baby birth weight(g)................. Smin Apgar.......................outcome Stillborn Neonatal Alive

Comment on labour delivery and puerperium (if block insufficient, use an extra sheet of paper)

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

<table>
<thead>
<tr>
<th>Early pregnancy</th>
<th>Antenatal</th>
<th>Intrapartum</th>
<th>Postpartum</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evacuation</td>
<td>Transfusion</td>
<td>Instrumental delivery</td>
<td>Evacuation</td>
<td>Anaesthesia GA</td>
</tr>
<tr>
<td>Laparotomy</td>
<td></td>
<td></td>
<td>Laparotomy</td>
<td>Epidural</td>
</tr>
<tr>
<td>Hysterectomy</td>
<td>Caesarean section</td>
<td>Hysterectomy</td>
<td>Spinal</td>
<td></td>
</tr>
<tr>
<td>Transfusion</td>
<td>Hysterectomy</td>
<td>Transfusion</td>
<td>Local</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>Transfusion</td>
<td>Manual Removal</td>
<td>Invasive monitoring</td>
<td>ICU ventilation</td>
</tr>
</tbody>
</table>

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

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

Comments on potential avoidable factors, missed opportunities and substandard care

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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11. THIS IS FORM COMPLETED BY:

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

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.

Last updated on: 15th March 2010
## SHOULDER DYSTOCIA REPORTING FORM

### Name of the hospital:

<table>
<thead>
<tr>
<th>Name of the patient</th>
<th>Hospital No</th>
<th>Gestation</th>
<th>Primi</th>
<th>Date</th>
<th>Multi</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Place of birth:</th>
<th>Labour room</th>
<th>OT</th>
<th>Other</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Mode of delivery:</th>
<th>SVD</th>
<th>Vacuum</th>
<th>Forceps</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Labour:</th>
<th>Spontaneous</th>
<th>IOL</th>
<th>Miso</th>
<th>Augmented</th>
<th>Synto</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Risk factors:</th>
<th>Previous h/o shoulder dystocia</th>
<th>Macrosomia</th>
<th>Diabetes</th>
<th>BMI&gt;30</th>
<th>None</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>H Help called time:</th>
<th>Emergency bell call time:</th>
</tr>
</thead>
</table>

### Situation

<table>
<thead>
<tr>
<th>Staff name and designation</th>
<th>Time of arrival</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Person conducting delivery</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Most senior midwife</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Most senior obstetrician</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Pediatrician</th>
<th></th>
</tr>
</thead>
</table>

### Manoeuvre

<table>
<thead>
<tr>
<th>Maneuver</th>
<th>Order</th>
<th>Time</th>
<th>By whom</th>
<th>Reason if not performed</th>
</tr>
</thead>
<tbody>
<tr>
<td>E Episiotomy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L McRoberts' position</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P Suprapubic pressure</td>
<td>From maternal</td>
<td>Left</td>
<td>Right</td>
<td></td>
</tr>
<tr>
<td>E Internal rotation Maneuvers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R Removal of Posterior Arm</td>
<td>Left</td>
<td>Right</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R Roll on all fours (Gaskin's)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description of traction</th>
<th>Routine axial (as in normal vaginal delivery)</th>
<th>Others</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Other maneuvers used</th>
<th></th>
</tr>
</thead>
</table>

### Procedure used to assist delivery

<table>
<thead>
<tr>
<th>Perineal trauma:</th>
<th>Intact Episiotomy</th>
<th>1st degree</th>
<th>2nd degree</th>
<th>3rd degree</th>
<th>4th degree</th>
</tr>
</thead>
</table>

| Length of labour: | 1st Stage: | 2nd stage: | |
|-------------------|------------|------------| |

<table>
<thead>
<tr>
<th>Time of delivery of head:</th>
<th>Head to body interval:</th>
<th>mins</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Fetal position during dystocia</th>
<th>Head facing maternal left</th>
<th>Head facing maternal right</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Birth weight:</th>
<th>Apgar: 1 minute</th>
<th>5-minute</th>
<th>10 minute</th>
</tr>
</thead>
</table>

| Baby examined by: | Arm weakness: | Yes | No | Left | Right | |
|-------------------|---------------|-----|----|------|-------| |

<table>
<thead>
<tr>
<th>Sign of fracture</th>
<th>Yes</th>
<th>No</th>
<th>Left</th>
<th>Right</th>
</tr>
</thead>
</table>

| Baby admitted | Yes | No | |
|---------------|-----|----| |

<table>
<thead>
<tr>
<th>Discussion with parents</th>
<th>Yes</th>
<th>No</th>
<th>By whom:</th>
</tr>
</thead>
</table>

### Outcome

<table>
<thead>
<tr>
<th>Name and designation of the person completing form:</th>
<th>Signature</th>
</tr>
</thead>
</table>

Adapted from NHS Foundation 2019

Reference: RCOG 2012

Incident No:
Appendix 10

SHOULDER DYSTOCIA DOCUMENTATION

Date: ___________________
Mother’s Name: ___________________
Time: ___________________
Date of birth: ___________________
Person completing form …………………………
Designation…………………………
Hospital Number: ___________________
Signature……………………………………………..
Consultant: __________________________
Called for help at: ……………………………
Emergency Cell via switchboard at: …………
Staff present at delivery of head …………………
Additional staff attending for delivery of shoulders …………

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
<th>Name</th>
<th>Role</th>
<th>Time arrived</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Procedures used to assist delivery

<table>
<thead>
<tr>
<th>By whom</th>
<th>Time</th>
<th>Order</th>
<th>Details</th>
<th>Reason if not performed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

McRoberts’s Position

Suprapubic pressure

Episiotomy

Delivery of posterior arm

Internal rotational maneuvers used

Description of rotation

Description of traction

Reason if not routine axial:

Other maneuvers used

Mode of delivery of head

<table>
<thead>
<tr>
<th>Spontaneous</th>
<th>Instrumental - vacuum / forceps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time of delivery of head</td>
<td>Time of delivery of baby</td>
</tr>
<tr>
<td>Head facing maternal left</td>
<td>Left fetal shoulder anterior</td>
</tr>
<tr>
<td>Head facing maternal right</td>
<td>Right fetal shoulder anterior</td>
</tr>
</tbody>
</table>

Birth weight: kg

Apgar: 1 min: 5 mins: 10 mins:

Art pH: Art BE: Venous pH: Venous BE:

Explaination to parents

Yes By: AIMS form completed Yes

Neonotologist called? Yes Neontologist arrived: ……………………………

If neonotologist not called or didn’t arrive, give reason:

<table>
<thead>
<tr>
<th>Baby assessment after birth (Maybe done by M/W):</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any sign of arm weakness?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Any sign of potential bone fracture?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Baby admitted to Neonatal Intensive care Unit?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Assessment by</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If yes to any of these questions for review and follow up by consultant neonotologist