Antenatal and Postnatal Care

A Manual for Facilitators

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CENTRE FOR MATERNAL AND NEWBORN HEALTH

Editors: Mary McCauley, Nynke van den Broek
Contributors: Olivia Hill, Hannah McCauley, Francis Muriithi

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Introduction

Maternal and perinatal mortality is still unacceptably high in many low- and middle-income settings. An estimated 303,000 women died in 2015 due to complications during pregnancy and childbirth. In addition, there were 2.7 million newborn deaths three quarters of which occur in the first week of life, and, an estimated 2.6 million stillbirths.[1] Neonatal deaths account for almost half of all deaths in children under five years of age. Most of these deaths could have been prevented if effective care had been available and of good quality.

The burden of pregnancy related morbidity is largely unknown but likely to be significant. For every maternal death, an estimated 20 to 30 women experience significant morbidity requiring healthcare. Preliminary studies show that during and after pregnancy, 3 out of 4 women have clinical symptoms, abnormalities on clinical examination and/or laboratory investigation, 1 in 2 women have anaemia, 1 in 3 social morbidity and 1 in 4 mental health problems.[2]

Since the Millennium Declaration in 2000, there have been reductions in both maternal and neonatal mortality, largely because of interventions that have been put in place around the time of birth. This has resulted in an increased uptake of skilled birth attendance or facility delivery from 56% globally in 1990 to 74% estimated in 2015.[1] Effective interventions during the time of childbirth and the period immediately after birth are particularly critical to reduce maternal deaths, stillbirths and early neonatal deaths. Ensuring that health needs are identified and met during and after pregnancy is equally important.

The scope of the international health targets has been expanded moving from a focus on preventing death to formulating targets for and emphasising the importance of health and well-being. The United Nations Global Sustainable Development Goal, (SDG), for health is to 'Ensure healthy lives and promote well-being for all at all ages'. Similarly, the Global Strategy for Maternal Newborn and Child health emphasises that all women have the right to the highest attainable standard of health and well-being including the physical, mental and social aspects of health.

Of the 50 essential interventions for reproductive, maternal, newborn and child health for which there is evidence of effectiveness and which can be expected to have a significant impact on maternal, newborn and child survival; more than half are expected to be implemented as part of a continuum of care during and after pregnancy.[3] It is important to ensure antenatal and postnatal care are integrated i.e. inclusive of the recognition and management of malaria, HIV/AIDS and tuberculosis (TB) as well as the provision of 'routine' obstetric care. In addition, it is important that care is differentiated i.e. meeting the specific identified health needs of each mother and her baby.

[1] WHO (2016) World Health Statistics 2016: Monitoring Health for the Sustainable Development Goals SDGs. Geneva: World Health Organization.
[2] Based on a study conducted by CMNH in 2015 among 11,454 women in Kenya, Malawi, Pakistan and India.
[3] WHO, Aga Khan University (2011) Essential Interventions, Commodities and Guidelines for Reproductive, Maternal, Newborn and Child Health: A global review of the key interventions related to Reproductive, Maternal, Newborn and Child Health (RMNCH). Geneva, Switzerland PMNCH.

Globally, 83% of women attend for antenatal care on at least one occasion during pregnancy and 64% attend four times or more.[4] In reality, in many cases this constitutes a series of 'missed opportunities'. Only 48% of women and babies globally receive postnatal care.[1]

Good care during and after pregnancy is important for the health of both the mother and the baby.

During antenatal care, conditions that may lead to complications of childbirth, maternal mortality, stillbirth and neonatal death can be prevented, identified and managed. Antenatal care links the woman and her family with the formal health system, has the potential to improve health during pregnancy for both the mother and her unborn baby, increase the probability of the mother receiving skilled birth attendance, essential newborn care and postnatal care.

Care in the period following birth is critical not only for survival, but, also for the future health and development of both the mother and her baby. An important challenge in the postpartum period is providing support for family planning to address a largely unmet need for contraception that can prevent unintended, untimely and unwanted pregnancies.

This manual is structured around the leading causes of ill-health in the mother during and after pregnancy and in the newborn baby. It sets out how antenatal and postnatal care can be organised such that it is comprehensive, integrated and differentiated. Mothers and babies will then receive the care they need, when they need it, and, in a way that is user-friendly, ensuring that both the mother and baby survive and thrive during and after pregnancy.

The guidance in this manual is based upon the latest available scientific evidence. Given that evidence-based medicine is the standard on which to base clinical practice, the manual will be updated as new information becomes available.

This manual is meant for use by all Facilitators of the antenatal and postnatal training workshops developed by the Centre for Maternal and Newborn Health for nurses, midwives, clinical officers, medical assistants and doctors – working in low- and middle-income countries.

Professor Nynke van den Broek

Dr Mary McCauley

Centre for Maternal and Newborn Health
Liverpool School of Tropical Medicine
United Kingdom

[4] WHO (2015) World Health Statistics 2015. Geneva: World Health Organization. Available from: http://www.who.int/gho/publications/world_health_statistics/2015/en/

Chapter 1: Being an effective Facilitator

Introduction

Facilitators are an essential part of this training programme and have a large influence on the quality of training. The success of this training programme depends not just on the commitment of the participants, but also on the energy and enthusiasm of the Facilitators. It is important that you are dedicated to being an effective Facilitator, that you prepare well, gather feedback from your peers and continually strive to improve the quality of the training programmes that you deliver.

As a Facilitator on this training course you will be supported by the course director who will be appointed by the steering group. Similarly, a course assessor will help with assessment of the participants. Twice-daily faculty meetings are held to ensure the smooth running of the course and to solve any queries or problems.

For many of the participants, this training style of teaching may be unfamiliar and may at first struggle to engage. It is useful to observe other Facilitators to see how they run their sessions and the lectures, to know how the participants are reacting to the theoretical aspects of the training. Facilitators can learn from each other, continually improving their facilitation skills.

The principles of adult learning

To be able to teach effectively it is useful to understand something of the principles of adult learning. Adults are generally in a learning situation because they want to be, whereas children are in a learning situation because they a required to be. This means that if adults do not want to be in the learning situation, they will not participate. This means that:

- Adults must appreciate the reason behind the context of the teaching
- Adults must enjoy what they are doing
- Adult learning must be interesting, relevant, applicable, achievable and learners must be able to say they have achieved something
- Adults must be able to see how what they learn can be applied to where they work
- Adults learn in different ways and hence different styles of teaching can be useful, including lectures, group work, role play, and group discussions

Effective facilitation

It is likely that you have much experience of teaching whether in a clinical setting, one-on one with a colleague or more formal teaching in a classroom/lecture setting. If much of your experience has been in the clinical rather than classroom setting, then it is normal to be apprehensive the first time you give a lecture or facilitate a skills station, especially in a different country and culture.

- Be well prepared. Read the lectures and familiarising yourself with all the training materials (including relevant resource materials) well before you are due to give them.
- A Facilitator will be familiar with the group to be trained. Prior to the training, a list of the participants will be available. Make time to understand the different types of healthcare providers who will be on the course and their backgrounds. There are different cadres of healthcare providers with varying pre-qualification training and experience. This may mean a

slightly different teaching and learning strategy for one group compared to another. While a mixed group during training has the effect of improving teamwork, the satisfaction of the various cadre with the training session depends on the quality of the Facilitator. Facilitators who can deliver the training at the right level, carrying all learners along in interactive sessions make effective trainers.

- Communication skills are very important. It is essential that you speak clearly, be culturally sensitive, avoid colloquial language, slang words, and do not use jokes as the content may not be understood by the participants. Take time to seek feedback, both formal and informally from other Facilitators and/or participants.
- Some of the participants may hold senior positions and have several years of clinical experience. Teaching this level of cadre can be challenging, especially to new Facilitators. Try to involve these participants in open discussions as much as possible, drawing on their experience.
- Remember that adults learn best when they can understand why they are learning something, they find the process of learning enjoyable and can see how it is applied in practice. Try to use examples which are relevant to their health system setting and take time to listen and learn from their experience of working in resource poor areas.

Preparation for breakout sessions

This Facilitators' manual contains detailed instructions for each of the breakout sessions. Each module chapter has the expected learning outcomes stated, equipment required for teaching, module programme, instructions for the breakout sessions and key references.

- Identify and prepare training space/room.
- Check the equipment needed for teaching is in the correct room and in working condition.
- Layout the equipment securely in the allocated room/space prior to the session.
- Before starting any session ensure you have the correct participant group and agree on some workshop rules.

Try to encourage participation of each group member by asking them to take on the roles needed in the session and ask participants to take turns. Remember that there will be a variety of cadres of healthcare providers on the training course and some may feel intimidated by those they consider to be more senior to them. You can try to encourage the more experienced participants to help the less experienced and encourage a sense of teamwork. Be conscious of time allocated for each session. Give a summary of the learning points at the end of each session.

Facilitating a lecture

Many of the lectures are basic concepts of routine antenatal and postnatal care. However, if the lecture is on a topic that is unfamiliar, this can create a degree of anxiety. This is normal and preparation is important. It can sometimes be challenging to give a lecture written by another person as you have not done the background work to it and it may not be in the teaching style that you are most comfortable with. However, we ask that you do not change the lectures but if you do have any suggestions to pass these onto the course director.

Prior to the lecture, make sure the laptop and the projection screen are available and working order.

Please introduce yourself to the participants at the start of your lecture with your name, where you are from and what job you do. All the lectures and the breakout sessions have a defined start, a middle and a defined end or closure summarising the key learning points.

Good preparation means that you will not have to read directly from the slides so can stand facing the learners to the right of the screen, so that they can see the slides but also hear you clearly.

Lectures will take around 20 minutes to deliver, including time for questions. If you are unsure of the answer, do not guess, and ask for advice.

Facilitating a case scenario

In a case scenario break out session the aim is to demonstrate a clinical scenario in a realistic way. Usually one of the Facilitators will take on the role of a woman and a participant will be invited to be the healthcare provider and asked to conduct the consultation working through the scenario.

Each case scenario is structured and the details are highlighted in each chapter.

Facilitating a skill station

We suggest teaching a skill in a four-part process:

1. The Facilitator demonstrates the skill in 'real time' without explanation.
2. The Facilitator demonstrates and explains the skill.
3. The Facilitator demonstrates the skill and the participants explain it.
4. The participants practice the skill.

Always introduce yourself and explain how the station will run and close the session by emphasising the main points.

Supporting participation

Try and deliver the training sessions in a way that includes all the participants and encourages open discussion. It is useful to compare techniques between other Facilitators regarding how best to ensure participants are fully engaged and responsive to the teaching sessions.

Health and safety

Please note, you are responsible for your own health and safety and that of your learners and colleagues. It is important to follow all infection prevention and control guidelines and dispose of sharps safely.

Top tips for effective facilitation

Suggestions

- ✓ Prepare in advance
- ✓ Use visual aids
- ✓ Speak clearly and loudly
- ✓ Encourage questions
- ✓ Give a summary at the end of each session
- ✓ Ensure that there is a simple 'take home message'
- ✓ Bridge one topic to the next
- ✓ Encourage participation
- ✓ Write clearly and boldly on flip charts
- ✓ Use logical sequencing of topics
- ✓ Use good time management
- ✓ Keep it simple
- ✓ Give participants feedback in a constructive way
- ✓ Position visuals so everyone can see them
- ✓ Avoid distracting mannerisms and distractions in the room
- ✓ Be aware of the participants' body language
- ✓ Keep the group focused on the task
- ✓ Provide clear instructions
- ✓ Check to see if your instructions are understood
- ✓ Evaluate as you go
- ✓ Be patient
- ✓ Maintain good eye contact (if culturally appropriate)

Try to avoid

- × Talking to the screen with your back to the group
- × Talking to the flip chart
- × Blocking the visual aids
- × Ignoring the participants' comments and feedback (verbal and non-verbal)
- × Reading directly from the manual
- × Using language that is culturally inappropriate
- × Using slang
- × Making jokes that are not culturally relevant and/or are not understood

Chapter 2: Antenatal care: first visit

2.1: Quality of care

Resources	
■ Pens	■ Flip charts

Key teaching points

This station is about how to provide care to women which takes account of their individual health needs and gives them a choice on how and where they receive that care. It will demonstrate how healthcare providers can provide respectful maternity care in a compassionate way and enable participants to reflect on the care they provide. For the role play scenario, one Facilitator will play the role of the pregnant woman attending for care and a participant will play the healthcare provider (nurse/midwife) taking the antenatal history.

Key learning outcomes

- Appreciate and understand the concept of respectful maternity care.
- Discuss how to promote respectful maternity care within the local healthcare system and facilities.

History

Facilitator role (pregnant woman)

A 23-year-old P2 attends for her first antenatal visit. She is approximately 24 weeks pregnant. She lives in a rural setting and is a farmer's wife. She has attended the clinic today as she is having intermittent dizzy spells and feels extremely tired most of the day. She is also experiencing foul smelling vaginal discharge which is green in colour. She is accompanied by her neighbour who is also attending for antenatal care. She does not have the required payment for the visit.

Participant role (midwife)

The midwife is tired because she is the only midwife in the clinic and there are at least 40 women waiting to be seen. To save time, she is taking the women's histories while the junior nurse/midwife assistant is taking the women's blood pressures. The midwife is from a different area to the woman but can speak in the local language.

Ask the participant playing the role of the midwife to take an obstetric history including:

- Last menstrual period
- Past obstetric history
- Medical history
- Any current complaints/symptoms

Discussion points

1. Introduction:
   - □ Did the midwife greet the woman kindly and introduce herself?
   - □ Did the midwife ensure confidentiality throughout the discussion?
2. History taking:
   - □ Did the midwife obtain all the relevant information?
   - □ Did the midwife ask why she attended the clinic and whether she wanted a companion to be with her during the consultation?
3. Clinical examination:
   - □ Did the midwife ensure privacy?
   - □ Did the midwife gain verbal informed consent before undertaking the examination?
4. How did she discuss her findings with the pregnant woman?
5. Documentation – document all discussions and findings in the relevant antenatal card.

General communication skills

Good communication skills, both verbal and non-verbal are important for any healthcare provider. Ask participants what are the keys skills required to communicate effectively and allocate one of the participants to write the answers from the group on a flip chart.

Possible answers include:

- Can listen to the woman and her family
- Can explain complex care/tests/treatment in words that the women will understand
- Use the same language as the women they are caring for
- Offer an interpreter if needed
- Demonstrate empathy for the women and her family
- Be non-judgemental
- Sitting at the same eye level as the women
- Making sure that you use eye-to-eye contact (as per cultural setting)
- Showing respect
- Being open-minded
- Providing a private space for the discussion

If any of these skills are not discussed by the participants, the Facilitator can prompt the them.

Respectful maternity care

- What do participants understand by respectful maternity care?
- What words can they think of to describe respectful maternity care?

Definitions

Respectful: This can be a feeling or holding someone in high regard, having respect for someone's knowledge, their judgement or how hard they work. When describing respectful care, we generally mean that care is given in a way that respects the woman, that is showing regard, compassion and giving the woman value and honouring her.

Empathy: Showing empathy for someone means understanding their situation, thinking how you would feel if you were in a similar situation and being able to share their feelings. This is often confused with having sympathy for someone that means showing compassion or sorrow for someone's problem or hardship.

Dignified: This means having a serious manner or aspect that commands respect from others. Being dignified is sometimes difficult to describe and it is often easier to describe what we mean being undignified – for example, belittling, shameful, degrading or humiliating. Treating women with dignity means listening to them, respecting their wishes and showing empathy with their situation.

Disrespect and abuse during pregnancy and childbirth is a global problem that occurs in all settings. Not treating a woman with respect and dignity when providing healthcare is a violation of their rights as a human being.

2.2: Models of antenatal care and referral

Resources	
■ Pens	■ Flip charts

Key teaching points

This session is a group discussion with the Facilitator helping to guide the direction of the discussion. The participants must acquire the understanding that early diagnosis of any ill-health and referral to the appropriate healthcare facility and healthcare provider is extremely important in antenatal care.

Key learning outcomes

- Develop an understanding of country specific antenatal models of care and maternal healthcare system.
- Understand the importance of appropriate referral to suitable healthcare facility and healthcare provider.

Instructions

- Group discussion of personal experience of delivery of antenatal care
- Compare care delivered at healthcare facility level and care in the community

Questions to guide the discussion

- What is the approach to comprehensive antenatal care in your setting?
- Who is responsible for delivery of antenatal care?
- Can you identify any gaps of antenatal care in your local setting?
- When and how do you refer women if you identify an antenatal problem?
- Do you have criteria for who requires follow-up visits at the healthcare facility in your setting?
  - □ Which cases can be managed at the healthcare facility?
  - □ Which cases must be referred to another healthcare facility?
  - □ Which cases can be referred to a different department in the healthcare facility? What criteria exist for optimisation of women prior to referral?

Discussion points

1. Discuss country specific guidelines, approach and visits.
2. How to refer women between healthcare facilities.
3. How to improve the routine antenatal care in local workplace.

2.3: First antenatal visit: full systematic assessment

Resources	
■ Blood pressure machine	■ Doppler or pinard
■ Thermometer	■ Domestic violence screening tool
■ Stethoscope	■ Flip chart
■ Antenatal card	

Key teaching points

This scenario can either be delivered in a group discussion or role play.
If using role play, one of the Facilitators can play the woman. The other Facilitator can give the participants the history and then one of the participants can be invited to play the role of the healthcare provider and conduct a full antenatal assessment of the woman.

The expected actions of the participant and the outcome of the visit is outlined below. If the participants fail to undertake a full assessment of the woman as outlined below, the Facilitator can lead them gently through the progress.

Key learning outcomes

- Carry out a comprehensive and holistic assessment of a pregnant woman during the booking visit.
- Give relevant information, education and counselling to women attending for care.
- How to plan appropriate antenatal care visit intervals and provide contact details.

History

Case 1
A 17-year-old primigravida who is 12 weeks pregnant attends the clinic. She has travelled a long way from a remote village. She reports feeling tired all the time, and is having night sweats.

Expected actions

Facilitator:	How would you assess this woman?
Participant:	Take a full history: □ Personal sociodemographic information □ Name, address, age, contact details, occupation, education level, religion □ Relationship status (single, married, separated, widowed) □ Recent forms of contraception used □ Past obstetric history □ Past medical history □ Past surgical history

Facilitator:	What other questions would you ask this woman?
Participant:	Any current symptoms and what is the duration of her various symptoms? ■ Is she experiencing fevers/sore throat/body rash? ■ Can she feel her baby moving? Is the pattern normal? ■ Has she ever been tested for HIV or syphilis? ■ Ask about danger signs Current medication Psychosocial history Ask the woman how she is feeling in general and if she has any problems or concerns? Discuss the social support she has and who is her birth companion.
Facilitator:	What other questions would you ask this woman?
Participant:	Screen for depression (Appendix 4 and 5) Screen for domestic violence using the HITS screening tool (Appendix 6)
Facilitator:	How would you confirm the pregnancy and gestation?
Participant:	Investigations that can be done to confirm pregnancy include: Urine test: Positive pregnancy urine test Blood test: Positive βhCG level on serology testing (if available) Identification of fetal heartbeat using: Handheld doppler/pinard Fetoscope auscultation Obstetric scan if available

Facilitator:	How and where would you examine this woman and why?
Participant:	Ensure privacy, confidentiality, consent, chaperone, companion Full head-to-toe full antenatal examination. ■ General affect – anxious, depressed, happy? ■ Conjunctival pallor ■ Sclera (white part of eye) – jaundice ■ Goitre ■ Lymphadenopathy ■ Skin (lumps/rashes/ulcers) ■ Mouth (bleeding gums/ulcers/thrush) ■ Pitting lower back/ankle oedema **On examination** ■ Height (cm), Weight (kg) ■ Calculate body mass index ■ Blood pressure ■ Temperature (°C) ■ Pulse rate, respiratory rate, pallor, oedema, fundal height, fetal heart (presence and rate) Examine the heart and chest and document findings (if trained to do so) ■ Wheezing ■ Heart murmur ■ Heart arrhythmia Examination of the abdomen. Inspection: shape, size, scar (s) and fetal movement Palpation: liver, fundal height, fundal palpation, tenderness, masses Auscultation: fetal heart rate

Facilitator:	What investigations would you like to do?
Participant:	**Blood** Haemoglobin (e.g. using Hemocue®) Malaria test (rapid diagnostic test) in malaria endemic areas Syphilis (rapid diagnostic test) HIV (rapid diagnostic test) – if HIV positive, initiate anti-retroviral therapy. ABO blood group and Rhesus factor Hepatitis B Random glucose level **Other setting specific investigations:** Test for sickle cell disease Stool test for ova and cysts **Urine** Glucose Protein Ketones Red blood cells Leucocytes Nitrites **Sputum (morning specimen)** In case of a cough >2 weeks which is productive and/or a woman who is HIV positive, sputum can be tested for TB. GeneXpert may be available in some settings for rapid testing.
Facilitator:	What else would you discuss with the woman if her HIV test is positive?
Participant:	■ Principles of breaking bad news. ■ Need for second confirmatory test. ■ Need for partner counselling and testing. ■ More frequent antenatal care schedule as women who are HIV positive have an increased risk of premature rupture of membranes, premature labour and stillbirth. ■ She needs counselling on prevention of mother-to-child transmission. ■ She can be advised to deliver her baby in a healthcare facility.

Facilitator:	How are you going to care for this woman?
Participant:	■ Provide psychological support. ■ Make further appointments that suit her to attend the clinic. ■ Ask if she would like you to explain the results to her family? ■ Advise on good nutrition, ferrous sulphate, long-lasting insecticide-treated bed nets and intermittent treatment for malaria. ■ Educate regarding danger signs and where to seek help. ■ Give her contact details for the specialist HIV clinic. ■ Document findings, plan of care, date of next appointment. ■ Promote healthy behaviours. ■ Give written information on danger signs

Discussion points

1. How long do you spend conducting a booking visit in your setting?
2. What are the benefits of taking time to conduct a comprehensive assessment at the booking visit?
3. How do you accurately confirm pregnancy in your setting?
4. Is ultrasound available? What are the benefits of ultrasound?
   - □ To confirm the location of the pregnancy
   - □ To determine if it is a single or multiple pregnancy
   - □ To determine the fetal heart rate
   - □ To measure the foetus to establish gestational age and fetal weight.
5. Even if a medical condition is diagnosed, all women can be assessed in a comprehensive way screening for other medical conditions, social and psychological ill-health.

2.4: Antenatal first visit: disclosure of domestic violence

Resources	
■ Domestic violence screening tool	■ Flipcharts and pens

Key teaching points

This case scenario may be delivered as a group discussion or role play. For this role play, one of the Facilitators can play the woman. The other Facilitator can give the participants the history, and then ask one of the participants to play the role of the healthcare provider and conduct a full assessment of the woman.

The expected actions of the participant and the outcome of the visit is outlined below. If the participants fail to undertake a full assessment of the woman as outlined below the Facilitator can lead them gently through the progress. At the end of the session the participants need to complete the HITS screening tool following the scenario.

It is important before starting this session that you can offer a debriefing session at the end of the day for the participants who may have been affected by domestic violence and abuse. Be aware of the reactions from the participants during the session and give the participants the opportunity to leave the session, if issues raised during the discussion relate to their own personal experiences.

Key learning outcomes

- Recognise women who may be experiencing domestic violence and practise how to screen women for domestic violence using the HITS screening tool (Appendix 6).
- Provide relevant information, education and counselling to women suffering from domestic violence regarding support services and how to access help.

History

A woman attends the clinic for her first antenatal appointment and is approximately three months pregnant. She has had three previous miscarriage and two live births. You have already conducted the systematic questions but, on examination, you notice that she has a swollen and bruised eye. Her mother-in-law/husband is present and when you mention your findings, he gives you a history of his wife falling over. He states that she is always doing things like this and that her mind is not good, that she can never remember or concentrate on anything. When you ask the woman how she feels, her husband quickly answers for her and she lowers her head and will not look at you. She begins to cry silently.

Expected actions

Facilitator:	Ask the participants to summarise the key points from the history How would you assess this woman?
Participant:	Acknowledge the information from the mother-in-law/husband and thank them. Explain that you need some time in private with the woman to check her and the baby. Let any other staff know quietly that you are concerned about this woman and ask for support managing the mother-in-law/husband.
Facilitator:	What concerns you about her history and what clinical exam would you perform?
Participant:	Danger signs: swollen and bruised eye, withdrawn mental state and her mother-in-law/husband not allowing her to speak. With consent conduct a head-to-toe antenatal exam and vital signs in a private area
Facilitator:	You see bruising on her abdomen and scars on her arms, what next?
Participant:	If she is alone, ask her what happened that she has bruises and a black eye – use the HITS screening tool. If you cannot get the woman alone, ensure then give her an appointment in the next few days and a contact number in case of an emergency.
Facilitator:	The woman discloses that she is an abusive relationship, both physical and emotional. What would you do now?
Participant:	Explain that you can help her and it is very good that she has disclosed this information to you. Ask direct questions about her situation. ■ Does she feel safe to go home today? ■ Does she have a support network/groups? ■ Who is available to help her at home?

Facilitator:	Would or could you offer this woman admission to the healthcare facility? What other options are locally available?
Participant	Healthcare facility admission can be offered depending upon the level of risk. Document in her notes that will be kept at the clinic. Discuss with and refer to any appropriate confidential support groups for domestic violence. Offer more frequent ANC visits and ensure she has details to contact the clinic in case of an emergency

Discussion points

1. How do you screen women for domestic violence in your settings and what options are available for these women?
2. If the woman's husband refuses to leave her side, how might you try to get her alone?
3. Think about your own security, what kind of plan have you got in place at your clinic if you are ever in a dangerous situation?
4. As a healthcare provider, what other signs may make you suspect domestic violence?
5. Consider the safety of any children at home, with violence in the household.
6. If the woman denies that domestic violence is taking place and you remain concerned about her welfare, explain how she can seek confidential help.

Chapter 3: Antenatal care: diagnostic tests

3.1: Measuring haemoglobin using HemoCue®

Resources	
■ HemoCue® machine	■ Lancet
■ Microcuvettes	■ Sharps container
■ Cotton wool	■ Clinical waste container
■ Alcohol wipes	■ Batteries

Key teaching points

This scenario covers how to conduct the procedure for performing a Hb test using the HemoCue® analyser. The HemoCue® meter can be used by healthcare providers for measuring Hb. This method is to be used for the determination of haemoglobin in venous, arterial or capillary whole blood using the HemoCue® meter.

In this practical session, we measure haemoglobin levels using the HemoCue® machine.

We suggest teaching this skill in a four-part process:

1. The Facilitator demonstrates the skill in 'real time' without explanation.
   - □ Demonstrate in silence how to take a blood sample and test it for Hb using HemoCue®.

2. The Facilitator demonstrates and explains the skill.
   - □ Demonstrate how to take a blood sample and test it for Hb using HemoCue® and explain in detail every step along the way.

3. The Facilitator demonstrates the skill and the participants explain it.
   - □ Demonstrate how to take a blood sample and test it for Hb using HemoCue® and ask the participant to explain the detail of every step along the way.

4. The participants practice the skill.
   - □ The participant demonstrates how to take a blood sample and test it for Hb using HemoCue® and explain in detail every step along the way.

Key learning outcomes

- ■ Undertake finger prick safety to obtain one capillary of blood.
- ■ Use the HemoCue® analyser to measure haemoglobin level.
- ■ How to clean the HemoCue® analyser
- ■ Understand the principles of diagnosis and management of anaemia during pregnancy.

Instructions

Collecting the sample	1. Turn on the instrument. After start-up, the cuvette holder can be in its loading position. 2. The display will show three flashing dashes and the HemoCue® symbol. 3. Make sure the woman's hand is warm and relaxed.

	4. Use only the middle or ring finger for sampling 5. Clean finger with disinfectant and allow to dry. 6. Using your thumb, lightly press the finger from the top of the knuckle towards the tip. This stimulates the blood flow towards the sampling point. 7. For best blood flow and least pain, sample at the side of the fingertip, not in the centre. 8. Whilst pressing lightly towards the fingertip, prick the finger using a lancet. 9. Wipe away the first two or three drops of blood, with cotton wool and dispose safely. 10. Re-apply light pressure towards the fingertip until another drop of blood appears. 11. When the drop is large enough, fill the microcuvette in one continuous process, filling from the tip of the microcuvette. 12. Blood is drawn into the microcuvette by capillary action and spontaneously mixed with the reagents inside the microcuvette.
Inserting the cuvette	1. Wipe off excess blood on the outside of the microcuvette tip using a tissue or cotton wool and dispose of safely. 2. Make sure no blood is drawn out of the microcuvette during this procedure. Look for air bubbles in the filled microcuvette. If bubbles are present, take a new sample. Small bubbles around the edge can be ignored.
Inserting cuvette into the meter	1. Place the filled microcuvette in the cuvette holder. 2. Testing can be performed within 10 minutes from filling the microcuvette. 3. Push the cuvette holder to its measuring position. 4. During the measurement, the hourglass symbol appears on the screen. 5. After 15-60 seconds, the Hb value of the sample is displayed. 6. The result will remain on the display if the cuvette holder is in the measuring position. 7. When operating on battery power the analyser will automatically turn off after approximately 5 minutes. 8. Once the test is completed, discard the used microcuvette in the clinical waste container.
Measuring range	The instrument has a measuring range of 0-25.6g/dl
Reference range	Adult males 13.0-17.0g/dl Adult females 12.0-15.0g/dl In pregnant women anaemia occurs if Hb <11.0g/dl
Cleaning the cuvette holder	■ At the end of each day's use, remove the cuvette holder and clean with alcohol or a mild soap solution. ■ The cuvette holder can also be autoclaved.

	■ It is important that the holder is completely dry before being replaced in the meter
Cleaning the optronic unit	1. Clean the optronic unit using the HemoCue® cleaner when directed to do so by an error message. 2. Check that the analyser is turned off. The display can be blank. 3. Pull the cuvette holder out to its loading position. Use a pointed object to carefully depress the small catch positioned in the upper right corner of the cuvette holder. 4. Whilst keeping the catch depressed, carefully pull the cuvette holder in the direction in which the handle of the cuvette holder is pointing. 5. Clean the cuvette holder with alcohol or mild detergent. 6. Push the HemoCue® cleaner swab into the opening of the cuvette holder. 7. Pull out and push in 5-10 times. If the swab is stained, repeat with a new swab. Stop when the swab comes out clean. 8. Wait 15 minutes before re-using the analyser. Replace the cuvette holder. The cover may be cleaned with alcohol or a mild soap solution
Documentation	Record the HemoCue® results in the woman's chart that will distinguish point-of-care results from central laboratory results. Record the collection date, time, operator initials and HemoCue® instrument ID number with the woman's result.

Discussion points

Anaemia is defined as a low concentration of haemoglobin. Haemoglobin is the main component of red blood cells that transports oxygen from the lungs to other tissues and then returns carbon dioxide from the body to the lungs for removal.

Symptoms of anaemia commonly include fatigue, muscle weakness, shortness of breath, rapid heartbeat and pale skin. Treatment for anaemia is based on the underlying cause and usually involves iron tables with folic acid, treatment for malaria if present, prevention of malaria in endemic areas and treatment of infection (bacterial) infection if present. In severe cases of anaemia, blood transfusion may be necessary.

HemoCue®

- Haemoglobin will be measured using a HemoCue® for the screening and ongoing management of women
- The measurement of haemoglobin in blood is one of the most frequently performed tests.
- A droplet of blood is required and this is obtained by finger-prick procedure.
- The results will be available within 60 seconds.

All samples must be treated as potentially infectious and handled appropriately and standard precautions employed. Personal protective equipment (e.g. non-sterile gloves) must be worn when processing samples.

3.2: Rapid diagnostic testing for Malaria

Resources	
■ Rapid diagnostic test packets	■ Lancet
■ Buffer	■ Sharps container
■ Microcuvettes	■ Gloves
■ Cotton wool	■ Pencil
■ Alcohol swab	■ Flipcharts and pens

Key teaching points

In this practical session, we will conduct the procedure for testing for malaria. To teach this skill, the Facilitator can present this practical session in the following options:

- For those participants who do not know this skill – demonstrate how to take a blood sample and test it for malaria and explain in detail every step along the way.
- If the participants are very experienced in this skill – ask one of the participants to demonstrate how to take a blood sample and test it for malaria
- The Facilitator demonstrates the skill and the participants explain it.
- Demonstrate how to take a blood sample and test it for malaria and ask the participants to practice the skill (in pairs)

Key learning outcomes

- Undertake finger prick safety to obtain one capillary of blood.
- Understand how to use the rapid diagnostic test for malaria and why the malaria control program has elected to use rapid diagnostic tests in the country/district.
- Describe the appropriate actions for rapid diagnostic test positive and negative results.

Instructions

Check the expiry date on the package. Do not use rapid diagnostic tests that have expired.

Using the kit	■ Open the test packet and remove the contents. ■ The test cassette is used to conduct the test. ■ Write the woman's name on the cassette. ■ Explain the holes and the markings and what each one means: ■ Square hole: labelled 'A' is where you add the woman's blood. ■ Round hole round hole: labelled 'B' is where you add the buffer.
Collecting the sample	1. Make sure the woman's hand is warm and relaxed. 2. Use only the middle or ring finger for sampling. 3. Clean finger with the alcohol swab, and allow to air dry. 4. Using your thumb, lightly press the finger from the top of the knuckle towards the tip. This stimulates the blood flow towards the sampling point. For best blood flow and least pain sample at the side of the fingertip, not in the centre. 5. Whilst pressing lightly towards the fingertip, prick the finger using a lancet. 6. Carefully and immediately discard the used lancet in a sharps container.

	7. Wipe away the first two or three drops of blood. Re-apply light pressure towards the fingertip until another drop of blood appears. 8. When the drop is large enough, fill the capillary tube in one continuous process, filling from the tip of the capillary tube. Blood is drawn into the tube by capillary action. Ensure a good-sized drop is on the finger before collecting. Collect just to the mark by placing the tip of the capillary tube on the blood drop of finger. 9. Give the woman a piece of cotton wool to swab the area where the blood sample was taken. Dispose of safely. 10. Capillary tube: This must be touched on the pad and remain there until all blood has left the tube (lifting off for a moment will introduce air bubbles and result in poor blood transfer). Discard the blood-collection device (e.g. capillary tube) safely after use. 11. Add the buffer solution (according to the test kit instructions). 12. Hold the buffer solution bottle vertically and squeeze the drops into the buffer hole. Do not touch the tube. 13. Wait for the correct duration of time (15 minutes) after adding buffer before reading test results. 14. Explain to participants that once the buffer is added to the cassette, gloves are no longer needed for their or the woman's safety. Remove and discard your gloves.
Discuss the results window	The rectangular hole is the results window where you read the test results. It is divided into two sections. The longer section near the letter 'T' is where you determine the diagnosis. If a line appears in this section, it means the woman has malaria. If no line appears here, it means malaria was not detected in the woman. The smaller section near the letter 'C' tells you whether the test is working correctly. A line must appear in this section for the test to be valid. If no line appears here, the test is not working properly and the results are invalid and you must discard the cassette and test the woman again using a new test packet that has not been previously opened (using a test from another batch number).
Interpretation of results	Discuss possible results: A line in 'T' and a line in 'C' = Positive for falciparum malaria (Note: test is positive even if the line in 'T' is very faint.) No line in 'T' and a line in 'C' = Negative Line in 'T' and no line in 'C' = Invalid No line in 'T' and no line in 'C' = Invalid
Logistics	Storage: Room temperature Shelf life: 24 months

Documentation	Record the results in the woman 's chart in a manner that will distinguish point-of-care results from central laboratory results. Record the collection date, time and result.
Clinical significance	Why test for malaria during antenatal care?
Actions for invalid and negative results	Explain that an invalid result means the rapid diagnostic test is damaged and the results may be incorrect (check the storage facilities). Ask participants: 'What will you do in case of a negative result?' Correct answer: Do not treat for malaria. If fever persists a few days after a negative rapid diagnostic test result and other appropriate management, it is appropriate to re-test the woman with another rapid diagnostic test, as rapid diagnostic tests may sometimes miss early malaria infections.
False positive results	Rapid diagnostic tests occasionally give false negative results. If symptoms consistent with severe malaria are present, national guidelines may recommend presumptive treatment with antimalarial medication, while referring the woman urgently for further acute management.
Hazards	All samples must be treated as potentially infectious and handled appropriately and standard precautions must be employed. Personal protective equipment (e.g. gloves and safety glasses) must be worn when processing samples, during quality control testing and maintenance procedures.

3.3: Rapid diagnostic testing for HIV and syphilis

Resource	
■ Rapid diagnostic testing strip	■ Microcuvettes
■ Cotton wool	■ Lancet
■ Alcohol wipe	■ Gloves
■ Sharps container	

Key teaching points

In this practical session, we conduct the procedure for testing for HIV and syphilis. This method can be used to determine the HIV and syphilis status in venous, arterial or capillary whole blood using the Duo test.

Teach this skill using a four-step process:

1. The Facilitator demonstrates the skill in 'real time' without explanation.
   - □ Demonstrate in silence how to take a blood sample and test it for HIV and syphilis.

2. The Facilitator demonstrates and explains the skill.
   - □ Demonstrate how to take a blood sample and test it for HIV and syphilis and explain in detail every step along the way.

3. The Facilitator demonstrates the skill and the participants explain it.
   - □ Demonstrate how to take a blood sample and test it for HIV and syphilis and ask the participant to explain the detail of every step along the way.

4. The participants practice the skill.
   - □ The participant demonstrates how to take a blood sample and test it for HIV and syphilis and explain in detail every step along the way.

Always introduce yourself and explain how the station will run and close the session by emphasising the main points.

Key learning outcomes

- ■ Undertake finger prick safely to obtain one capillary of blood.
- ■ Using the rapid diagnostic test kit for the testing of HIV and syphilis.
- ■ Understand the principles of testing and diagnosis of HIV and syphilis in pregnancy.

Instructions

Collecting the sample	1. Label the test with the women's name and date of test 2. Gain consent and make sure the woman's hand is warm and relaxed. 3. Use only the middle or ring finger for sampling. 4. Clean finger with disinfectant and allow to dry. 5. Using your thumb, lightly press the finger from the top of the knuckle towards the tip. This stimulates the blood flow towards the sampling point. 6. For best blood flow and least pain sample at the side of the fingertip, not in the centre.

	7. Whilst pressing lightly towards the fingertip, prick the finger using a lancet. 8. Wipe away the first two or three drops of blood. 9. Re-apply light pressure towards the fingertip until another drop of blood appears. 10. When the drop is large enough, fill the capillary tube in one continuous process, filling from the tip of the capillary tube. 11. Blood is drawn into the tube by capillary action.
Using the kit	Use the plunger to place one droplet of blood on the strip. Testing must be performed within 10 minutes from filling the microcuvette. After 15-60 seconds, the results of the sample are displayed. Once the test is completed, discard the used strip and capillary tube in the sharps container.
Logistics	Storage: Room temperature Shelf life: 24 months
Documentation	Record the results in the woman's chart in a manner that will distinguish point-of-care results from central laboratory results. Record the collection date, time and result.

Discussion points

Clinical significance	HIV and syphilis are the major public health problems affecting women during and after pregnancy and their newborn babies. Complications include pregnancy loss, stillbirth or a baby born infected with and suffering from HIV and syphilis.
HIV/Syphilis Duo Rapid test	The Duo Rapid test allows simultaneous detection of HIV-1/2 and syphilis antibodies test using one device. A droplet of blood is required and this is obtained by finger-prick procedure. The results of both tests will be available within 15-20 minutes.
Hazards	All samples must be treated as potentially infectious and handled appropriately and standard precautions must be employed. Personal protective equipment (e.g. gloves and safety glasses) must be worn when processing samples, during quality control testing and maintenance procedures

Discussion points

Why test for HIV and Syphilis during antenatal care?

1. To prevent mother to baby transmission of HIV

Approximately 90% of HIV infections in children occur because of mother-to-child-transmission during pregnancy, delivery and breastfeeding. Transmission by a pregnant woman infected with HIV to her baby is preventable by testing, counselling and medical care.

Using rapid HIV testing enables the healthcare provider to obtain the results and provide HIV care (counselling and treatment) as part of antenatal care.

2. To prevent congenital syphilis or stillbirth

Pregnant women infected with syphilis may transmit syphilis to their unborn child. Syphilis is easily treatable with penicillin. Visiting antenatal early in pregnancy with their partner/husband for prevention and treatment is important. Treatment in the early stages of pregnancy can prevent congenital syphilis, stillbirth or premature births. Rapid syphilis test allows for diagnosis and treatment on the same day.

3.4: Screening and diagnosis of Tuberculosis

Resources	
■ Containers for sputum	■ Permanent marker pens
■ Disposable gloves	

Key teaching points

In this practical session, we discuss the procedure for testing for tuberculosis.

Key learning outcomes

- Able to undertake a sputum sample for testing.
- Discuss the use of GeneXpert for the testing of TB.
- Understand the principles of testing and diagnosis of TB during and after pregnancy.

Instructions

Collecting the sample	1. Check expiry date on the test packet. 2. Put on gloves. 3. Collect sputum sample from the woman with suspected TB. 4. The sputum is mixed with the reagent that is provided with the assay, and a cartridge containing this mixture is placed in the GeneXpert® machine. 5. Do not try to use the test more than once.
How to read the test results	Results of GeneXpert® can be interpreted along with clinical, radiographic, and other laboratory findings. The GeneXpert MTB/Rifampin assay does not replace the need for smear with microscopy for acid-fast bacilli, culture for mycobacteria, and growth-based drug susceptibility testing, in addition to genotyping for early discovery of outbreaks. **MTBC detected**: Mycobacteria have a high probability of resistance to rifampin; can be confirmed by additional testing. If rifampin resistance is confirmed, rapid molecular testing for drug resistance to both first-line and second-line drugs can be performed so that an effective treatment regimen can be selected.
Negative result	**MTBC not detected**: Mycobacteria are probably susceptible to rifampin; All tests that are positive for MTBC must have growth-based susceptibility testing to first-line TB drugs.
Invalid result	**Indeterminate:** the test could not accurately determine if the bacteria are resistant to rifampin. Growth-based susceptibility testing to first-line TB drugs must be performed.

Storage and shelf life	Storage: Room temperature Shelf life: 24 months
Documentation	Record the results in the woman's chart in a manner that will distinguish point-of-care results from central laboratory results. Record the collection date, time and result.
Advantages of the Xpert MTB/RIF Assay	■ Time efficient methods for detecting Mycobacterium tuberculosis bacteria and mutations isoniazid resistance. ■ Availability of quick test results leads to improved patient management and outcomes, and preventing unnecessary use of resources (avoiding unnecessary treatment, respiratory isolation). ■ Fully automated system; minimal technical training is required to run the test. ■ Prompt identification of multidrug-resistant TB (MDR TB) cases as resistance to rifampin, in most instances, co-exists with resistance to isoniazid. Rapid diagnosis of rifampin resistance potentially allows TB patients to start on effective treatment much sooner than waiting for results from other types of drug susceptibility testing. ■ If rifampin resistance is detected, confirmation of resistance can be done by DNA sequencing.

Discussion points

1. Discuss country specific guidelines – symptoms associated with TB and current screening for TB.
2. Discuss challenges with diagnosis of TB in pregnancy

Clinical significance	■ TB is a public health problem and is a significant contributor to maternal mortality and is among the three leading causes of death among women aged 15-45 years in high burden areas. ■ The exact incidence of TB in pregnancy, though not readily available, is expected to be as high as in the general population. ■ Diagnosis of TB in pregnancy may be challenging, as the symptoms may initially be ascribed to the pregnancy, and the normal weight gain in pregnancy may temporarily mask the associated weight loss.
Test	The GeneXpert® test MTB/rifampin assay is a rapid diagnosis test molecular test for TB which diagnoses TB by detecting the presence of TB bacteria, as well as testing for resistance to the drug rifampicin. The test is a molecular test which detects the DNA in TB bacteria. It uses a sputum sample and can give a result in less than 2 hours. It can also detect the genetic mutations associated with resistance to the drug rifampicin. ■ The main advantages of the test are, for diagnosis, reliability when compared to sputum microscopy and the speed of getting the result when compared with culture. For diagnosis of TB, although sputum microscopy is both quick and cheap, it is often unreliable. It is

	particularly unreliable when in HIV positive individuals. Although culture gives a definitive diagnosis, the result usually takes weeks rather than the hours of the GeneXpert® test. ■ GeneXpert® MTB/rifampin assay is a nucleic acid amplification test which simultaneously detects DNA of MTBC and resistance to rifampin (i.e. mutation of the rpoB gene) in less than 2 hours. In comparison, standard cultures can take 2 to 6 weeks for MTBC to grow and conventional drug resistance tests can add 3 more weeks.
Hazards	■ All samples must be treated as potentially infectious and handled appropriately and standard precautions must be employed. Personal protective equipment (e.g. gloves and safety glasses) must be worn when processing samples, during quality control testing and maintenance procedures.

FACT BOX

- TB is a public health problem and is a significant contributor to maternal mortality and is among the three leading causes of death among women aged 15-45 years in high burden areas.
- The exact incidence of TB in pregnancy, though not readily available, is expected to be as high as in the general population.
- Diagnosis of TB in pregnancy may be challenging, as the symptoms may initially be ascribed to the pregnancy, and the normal weight gain in pregnancy may temporarily mask the associated weight loss.
- Obstetric complications of TB include miscarriage, intra-uterine growth restriction, preterm labour, low birth weight, and increased neonatal morbidity and mortality.
- Congenital TB though rare, is associated with high perinatal mortality.
- Rifampicin, isoniazid and Ethambutol are the first line drugs while Pyrazinamide use in pregnancy is gaining popularity.
- Isoniazid preventive therapy is a WHO innovation aimed at reducing the infection in HIV positive pregnant women.
- Babies born to this mother can be commenced on isoniazid prophylaxis for six months, after which they are vaccinated with Bacillus Calmette-Guérin if they test negative.
- Successful control of TB demands improved living conditions, public enlightenment, primary prevention of HIV/AIDS and Bacillus Calmette-Guérin vaccination.

Chapter 4: Antenatal care: subsequent visits

4.1: Screening for psychological ill-health during pregnancy

Resources	
■ Whooley questions template	■ Flip charts
■ Edinburgh Postnatal Depression Score template	■ Pens

Key teaching points

The discussion takes place with the Facilitator as the focus and retaining the direction of the discussion. The participants will acquire an understanding of the barriers and stigma associated with maternal mental ill-health. Discussion can concentrate on how women are screened for psychological ill health currently and the Whooley questions (Appendix 4) and Edinburgh Postnatal Depression Score (Appendix 5) can be introduced as potential screening tools.

Key learning outcomes

- Develop an understanding of barriers to disclosure of depression and other forms of psychological ill-health.
- Understand the importance of screening for psychological ill-health during pregnancy.
- Understand the important of treatment early in pregnancy and the effect non-treatment can have on the mother and developing baby.

Instructions

- Group discussion of personal experience of psychological screening and psychological ill-health in pregnancy
- Compare care delivered at healthcare facility level and care in the community

Questions to guide the discussion

- Who is responsible for screening pregnant women for depression and other psychological conditions?
- Can you identify stigma that is associated with psychological ill-health?
- When and how do you refer women if you identify psychological ill-health?
- What effect do you think untreated psychological ill health has on?
  - □ The mother
  - □ The developing baby
  - □ The woman's family

Discussion points

- Discuss country specific guidelines – approach and visits.
- How to improve the routine screening for psychological conditions during pregnancy.

4.2: Abdominal palpation

Resources	
■ Abdominal model	■ Tape measure
■ Doppler	■ Cover sheet
■ Pinard	

Key teaching points

In this practical session, an abdominal palpation of the mother is conducting to determine the lie, presentation, symphysis-fundal height and fetal heart rate of her baby.

This skill can be taught in a four-part process:

1. The Facilitator demonstrates the skill in 'real time' without explanation.
   - □ Demonstrate in silence how to examine a woman, how to measure symphysis-fundal height and how to listen to the heartbeat.

2. The Facilitator demonstrates and explains the skill.
   - □ Demonstrate how to examine a woman, how to measure symphysis-fundal height and how to listen to the heartbeat and explain in detail every step along the way.

3. The Facilitator demonstrates the skill and the participants explain it.
   - □ Demonstrate how to examine a woman, how to measure symphysis-fundal height, and how to listen to the heartbeat and ask the participant to explain the detail of every step along the way.

4. The participants practice the skill.
   - □ The participant demonstrates how to examine a woman, how to measure symphysis-fundal height and how to listen to the heartbeat and explain in detail every step along the way.

Key learning outcomes

- ■ Conduct an abdominal palpation
- ■ Identify normal and abnormal lie and presentation of the foetus using palpation.
- ■ Measure symphysis-fundal height.
- ■ Listen to the fetal heart using a pinard and doppler.

Instructions

Preparation

- ■ Introduce yourself to the woman and explain what you are going to do.
- ■ Obtain verbal consent, ensure a chaperone, offer her companion to be present.
- ■ Position the woman in a semi-recumbent position, arms by her side with the abdomen relaxed.
- ■ Ask the woman if her bladder is empty, offer her the use of the toilet.
- ■ Wash your hands, it is not necessary to use gloves.
- ■ Expose as much of the abdomen as necessary for a thorough examination.
- ■ Cover the woman and maintain privacy.

Inspection

- Visual inspection the abdomen – size, shape, skin changes, previous scars, are fetal movements are obvious.
- Ask the woman to take a deep breath and let it out slowly, and to relax her body as you palpate her abdomen.

Palpation

- To find out if the baby is vertical, lay one hand flat on each side of the mother's abdomen.
- Press in gently but firmly, first with one hand, and then with the other.
- Feel the woman's abdomen with your hands on each side, pushing gently with each hand in turn.
- Next, feel the woman's abdomen for a large, hard shape (the baby's back). If you can feel it the baby is facing the woman's back.
- Demonstrate pelvic palpation to determine fetal presentation, attitude and engagement or non-engagement of presenting part.
- Use the two-handed method, one on either side of the presentation with the fingers directed inwards and downwards, is more comfortable than the one-handed approach with the fingers facing the woman's head.
- Press firmly with your fingers just above the pubic bone to see if you can feel the baby's head.
- Now feel the top of the mother's uterus (the fundus), just below her ribs.
- Demonstrate that you can feel it round and hard, like a head.

Measure symphysis-fundal height

- Gently palpate to identify the uterine fundus.
- Measure the distance from the uterine fundus to the upper rim of the symphysis pubis.
- The tape cannot be stretched too tight.
- Enter the correct measurement on the antenatal card and/or, if available, plot on symphysis-fundal height graph, against the weeks of gestation.

Discussion points

1. When can symphysis-fundal height be measured?
   - □ Symphysis-fundal height can be measured and recorded at each antenatal appointment. Between 28-36 weeks of gestation, the symphysis-fundal height measurement in centimetres usually corresponds to the number of weeks of gestation (± 2 weeks).
2. What if the symphysis-fundal height measurement is less than expected?
   - □ The baby is not growing well (small-for-gestational-age or intrauterine growth restriction).
   - □ There is not enough liquor, oligohydramnios.
   - □ The baby is in transverse lie.
3. What if the symphysis-fundal height measurement is more than expected.
   - □ There is more than one foetus, multiple pregnancy.
   - □ There is more than normal liquor, polyhydramnios.
   - □ The baby is bigger than normal, macrosomia.
4. When does, fetal lie have clinical significance?
   - □ Fetal presentation can be assessed by abdominal palpation at 36 weeks or later, when presentation is likely to influence the plans for the birth.

4.3: Antenatal care: assessment and planning

Resources	
■ Blood pressure machine	■ Speculum
■ Examination couch	■ Thermometer and stethoscope
■ Paper and pens	

Key teaching points

One Facilitator can play the woman. The other Facilitator can present the scenario to the participants and a participant can conduct the booking interview. The expected actions of the participant and the outcome of the visit is outlined below. If the participant fails to undertake a full assessment of the woman as outlined below, the Facilitator can lead them gently through the process.

Key learning outcomes

- Recognise maternal antenatal complications.
- Give relevant information, education and counselling to women attending for antenatal care.
- Plan appropriate antenatal visit intervals and provide contact details.

History

The woman (multigravida) arrives at the antenatal clinic, she tells you that she is 28 weeks pregnant (7^{th} pregnancy – 2 miscarriages previously, previous delivery the baby died after birth for being too small). She reports feeling tired all the time and she has had some weight loss during this pregnancy. She has been suffering with nausea during the first months of pregnancy so she has not been eating very well during this pregnancy.

She lives in a rural village that is in a malaria-endemic area, she reports that she has been treated for malaria twice in the past 12 months. The most recent episode was 4 months ago, when she was 12 weeks pregnant, during which she was treated with antimalarial drugs. She is also complaining of some light vaginal bleeding (no pain), which is why she came to the clinic today.

Expected actions

Facilitator:	Ask participants to identify the key issues from history. What questions would you want to ask the woman?
Participant:	Introductions using respectful maternity care principles. Ask how is she feeling? Is she pale? Does she have any other complaints? Prepare the woman for the examination.

Facilitator:	What would you look for on examination?
Participant:	Head-to-toe full antenatal exam. Look for anaemia, jaundice, lymphadenopathy. Pulse rate, intrauterine device, blood pressure, temperature, (all are normal) pallor, oedema, fundal height, fetal heart (presence and rate) Ask about other danger signs. Maternal weight and height measured – calculate body mass index. Calculate estimated date of delivery.
Facilitator:	What investigations would you like to do? Pregnant women can be informed about the purpose of any test before it is performed.
Participant:	Take booking bloods, Hb, malaria rapid diagnostic tests, Syphilis, rapid, HIV test, ABO blood group and rhesus factor, Hep B, urinalysis. Screen for TB Speculum examination to indicate source of bleeding Check for other signs/symptoms of sexually transmitted infections and vaginal infections if indicated consider vaginal and cervical swabs for testing.
Facilitator:	No active bleeding seen in speculum examination. (Malaria negative, Hb 8g/dl), measurement of the fundal height is smaller than the baby's gestational age. How are you going to treat this woman?
Participant:	Woman: 1. Check for pregnancy-induced hypertension. 2. Treat for anaemia (per local policy.) 3. Consider deworming or testing stool for parasite ova and cysts. 4. Consider malaria intermittent presumptive therapy. 5. Suspect small-for-gestational-age or fetal growth restriction. 6. Placenta previa is a possibility. Plan: Refer for an ultrasound if available to: 1. Identify the position of the placenta. 2. To measure the foetus and calculate an estimated fetal weight. If available, a series of ultrasound scans could be done over to time to document weight gain or lack thereof. 3. Depending on results of the ultrasound scan, highlight the importance of follow-up care or care in the community.

Facilitator:	How are you going to advise and follow-up this woman and her baby?
Participant:	Assist the woman to plan for the referral for ultrasound and follow-up visit to discuss the results. Counsel the woman on: ■ Heavy vaginal bleeding and/or abdominal pain ■ Maternal nutrition ■ Use of long-lasting insecticide-treated bed nets to prevent malaria ■ Importance of scheduled visits

Discussion points

1. Discuss the danger signs and emergency planning in your facility.
2. Timing and number of antenatal visits, 8 visits, see fact box to refer to.
3. Discuss the family's social network and any challenges faced to attend antenatal visits.

FACT BOX

Weeks of Pregnancy	**Why see the mother?**	**What is conducted?**
12-16 weeks	This is **usually the first or booking visit** ▪ Assess woman's obstetric and general health needs ▪ Plan for the pregnancy and birth Screen for domestic violence ▪ Screen for psychological ill-health and domestic violence	▪ Confirmation of pregnancy ▪ Dating ▪ Determine estimated date of delivery ▪ Full physical examination ▪ Investigations including: blood pressure, urine test for protein and glucose, Hb, syphilis, HIV, malaria and TB ▪ Calculate body mass index ▪ Discuss place of delivery ▪ Arrange subsequent visit date and place
Between 18 and 34 weeks, visits every 4 weeks		
18-20 weeks	Anomaly Scan (if ultrasound is available)	A scan of the baby to confirm: ▪ Single pregnancy (or multiple) ▪ The placental position ▪ Fetal wellbeing ▪ If fetal anomalies are present And: ▪ Discuss results of anomaly ultrasound scan ▪ Check blood pressure and urine for protein ▪ Measure symphysis-fundal height ▪ Check fetal heart rate

24-28 weeks	Reassess woman's obstetric and medical history	Check blood pressure and urine for protein Measure symphysis-fundal height Check fetal heart rate
28-32 weeks	Reassess woman's obstetric and medical history Check the lie and presentation of foetus	Check blood pressure and urine for protein Measure symphysis-fundal height Check fetal heart rate Administration of Anti D if required
Between 32 and 38 weeks, visits every 2 weeks		
32-38 weeks	Reassess woman's obstetric and medical history Agree the time of Caesarean section, if the woman has opted for an elective Caesarean section Prepare for birth in an emergency	Check blood pressure and urine for protein Measure symphysis-fundal height Check fetal heart rate Check presentation
Between 38 and 40 weeks, visits every week		
38	Reassess woman's obstetric and medical history	Check blood pressure and urine for protein Measure symphysis-fundal height Confirm presentation
40	Reassess woman's obstetric and medical history	Check blood pressure and urine for protein Review Plan for repeat visit in one week if the woman has not yet given birth
41	Reassess woman's obstetric and medical history	Check blood pressure and urine for protein Review Offer a membrane sweep Offer date for induction of labour at 40^{+10} days if low risk

4.4: Antenatal care: subsequent visits

Resources	
■ Blood pressure machine	■ Thermometer and stethoscope
■ Urinalysis reagent strips	■ Paper and pens
■ Pinard	

Key teaching points

One of the Facilitators can play the woman. The other Facilitator can give the participants the history and then ask one of them to play the role of the healthcare provider and conduct a full antenatal assessment of the woman. The expected actions of the participant and the outcome of the visit is outlined below. If the participants fail to undertake a full assessment of the woman as outlined below the Facilitator can lead them gently through the progress.

Key learning outcomes

- Understand the rationale and principles of routine antenatal care for woman and their families.
- Describe how to conduct a routine assessment of a pregnant woman.
- Plan appropriate antenatal care visit intervals and provide contact details.
- Recognition, early detection and treatment of problems and complications.
- Prevention of complications and diseases.
- Preparedness for birth and complication readiness.
- Health promotion.

History

A woman in her first pregnancy is 6 months' pregnant and attends for an antenatal care visit. She completed her first antenatal visit at 16 weeks and has not been seen since. She is HIV positive but has not been able to tell her partner or family.

Expected actions

Facilitator:	What questions would you want to ask this woman?
Participant:	Introductions using respectful maternity care principles Greet the woman and introduce yourself, is she there for her routine visit or for a specific problem. General assessment. Does she have any complaints? Is she taking her medication? Is she experiencing fevers/sore throat/body rash? Ask about danger signs.

Facilitator:	Ask the woman if she suffering with any of the following (HIV related)?
Participant:	■ Fever ■ Persistent diarrhoea ■ Cough ■ Dysuria ■ Vaginal discharge ■ Weight loss ■ Skin rashes/infection
Facilitator:	What would you look for on examination?
Participant:	Ensure privacy, confidentiality, consent, chaperone and companion Clinical observations: Check vital signs: temperature, blood pressure, pulse rate, respiratory rate General examination: check the mother for: □ Pallor, jaundice □ Breast examination □ Genital examination (if clinically indicated) □ Emotional factors □ Record all antenatal care given including findings in the antenatal register Obstetric examination: □ Abdomen examination – assess fundal height, lie, presentation, exclude multiple pregnancy □ Fetal heart rate
Facilitator:	What investigations would you like to do?
Participant:	Malaria rapid diagnostic test, test urine for protein (consider both CD4 and viral load testing can be provided at least once in each trimester)
Facilitator:	From the abdominal examination, you suspect a twin pregnancy. How are you going to treat this woman?
Participant:	Refer for ultrasound scan if available to confirm or offer closer monitoring.

Facilitator:	For which of her HIV symptoms does the women need to seek medical advice?
Participant:	She needs to seek medical help if any of the following develop: ■ Jaundice (yellow eyes) ■ Pallor ■ Abdominal pain ■ Shortness of breath ■ Skin rash ■ Abnormal pain in her feet or hands
Facilitator:	How are you going to advise and follow-up for this case?
Participant:	Provide psychological support, advise the woman to bring her family in for the next visit to talk about HIV. Advise on good nutrition, ferrous sulphate, long-lasting insecticide-treated bed nets and intermittent presumptive treatment for malaria in pregnancy (IpTP). Offer Tetanus Toxoid injection if indicated Offer Anti D if Rhesus negative and indicated Tell her about danger signs. Give her contact details for her closest clinics/hospitals. Document findings, plan of care, date of next appointment.

Discussion points

1. Try to have some time alone with the woman to discuss her social situation regarding disclosure. (The WHO advocates that the healthcare provider has a duty to disclose to any known partners if the woman is reluctant to do so).
2. When to do an ultrasound scan? – the WHO recommends before 24 weeks' gestation (early ultrasound) to estimate gestational age, improve detection of fetal anomalies and multiple pregnancies, reduce induction of labour for post-term pregnancy, and improve a woman's pregnancy experience.

Chapter 5: Common discomforts during pregnancy

5.1: Identifying and treating common discomforts during pregnancy

Resources	
■ Pens	■ Flip charts

Key teaching points

One Facilitator can play the pregnant woman. The other Facilitator can give the participants the history and ask them to deal with the woman as they would in a real-life situation. The expected actions of the participants and their outcomes for the Facilitator to feedback are listed below. If the participants are failing to deliver the expected treatment, guide them gently through the process. Encourage discussion and team work.

Key learning outcomes

- Carry out a medical consultation to treat complaints during pregnancy, discuss each of the problems.
- Provide relevant information/education/counselling to women attending antenatal care.
- Distinguish between minor and major complaints or disorders.

History

The woman arrives at the antenatal care clinic, 28 weeks pregnant, very tired and suffering from many complaints. This is not one of her routine visits and she has forgotten her antenatal card so the midwife will not see her until the end of the clinic. During the consultation, the woman complains of 1) heartburn 2) constipation, 3) swollen ankles and 4) frequency of urine.

Expected actions

Facilitator:	What questions would you ask the woman?
Participant:	Take an overview of current pregnancy and ask specific questions concerning these symptoms. ■ What is the duration of her various symptoms? ■ Has she been treated with any medication? ■ Is she taking any iron supplementation? ■ Has she been treated for malaria recently and is she using a long-lasting insecticide-treated bed net? ■ Is she experiencing any other symptoms, fevers/sore throat/body rash? ■ Can she feel fetal movements?

Facilitator:	The woman is complaining of fever. She was treated for malaria one week ago, and does not have a long-lasting insecticide-treated bed net. She developed constipation since she started taking the iron tablets one month ago. The baby moves frequently, as though its doing somersaults, and the woman cannot sleep at night. She passes urine frequently.
Facilitator:	What would you look for on examination?
Participant:	■ Look for anaemia. ■ Clinical observations, pulse rate, respiratory rate, blood pressure, temperature, (all are normal) pallor, oedema. ■ Abdominal palpation, symphysis-fundal height, fetal heart (presence and rate). ■ Ask about danger signs.
Facilitator:	What investigations will you do?
Participant:	Rapid test for checking Hb, urine dipstick.
Facilitator:	Hb result is 9.8g/dl , urine test is negative. How are you going to treat this woman for heartburn?
Participant:	Heartburn is a strong, burning pain in the chest. It is caused by the valve between the stomach and the gullet (oesophagus) leading to the stomach relaxing in pregnancy, so that the stomach acid passes up into the tube. It is often brought on by lying flat. Advise the woman to: ■ Sleep well propped up – use extra pillows or blankets. ■ Avoid eating or drinking for a few hours before going to bed. ■ Avoid triggers – fatty, spicy foods. ■ Eating small meals more frequently. ■ Medication such as antacids if other measures do not work.
Facilitator:	How are you going to treat this woman for constipation?
Participant:	Constipation is common during pregnancy due to the hormonal changes in the body. To prevent constipation, advise the woman to: ■ Eat foods that are high in fibre, such as cereals, fruit and vegetables, and pulses, such as beans and lentils. ■ Try home or plant-based remedies that will soften the stool. ■ Drink plenty of water. ■ Avoid supplements, as they can cause constipation.

Facilitator:	How are you going to treat this woman for oedema?
Participant:	During pregnancy, swelling of the ankles occurs because the body retains more fluid than usual. To avoid and ease the ankles swelling, advise the woman to refrain from standing for prolonged periods, wear comfortable shoes and elevate the feet as much as possible. Perform some foot exercises – rotating the foot in circles and bending/stretching the foot up and down.
Facilitator:	How are you going to treat this woman for frequency of urine?
Participant:	Needing to pass water frequently is an early sign of pregnancy and can continue throughout pregnancy. Advise the woman: to try cutting out drinks in the late evening, but ensure she drinks plenty of fluids during the day.
Facilitator:	How are you going to treat the extra symptoms of anaemia?
Participant:	The woman can be advised to commence iron and folic acid supplementation daily and have a Hb test in four weeks. Educate her on the importance of eating foods which contain iron such as green leafy vegetables, meat, liver, beans, fish, etc.
Facilitator:	How are you going to treat the extra symptoms of malaria?
Participant:	The test was positive, but she self-treated a week ago, and the symptoms are decreasing. Test again in one week, the blood smear is usually negative after day fourteen. Provide two long-lasting insecticide-treated bed nets, one for her and one for her family. Re-emphasise the need to seek health care when a fever develops and the harm that the self-treatment of malaria can cause.

Facilitator:	If all the symptoms above are not relieved, what will you advise? (Prompt: discuss follow-up care)
Participant:	**Heartburn** If the symptoms are not relieved with diet and lifestyle changes, the midwife may prescribe medications to help to ease the symptoms, e.g. Ranitidine 150mg twice daily which can effectively treat oesophageal reflux. Intermittent use of metoclopramide is safe in pregnancy. For severe symptoms, Omeprazole can be prescribed after a medical review. **Constipation** The healthcare provider may prescribe an oral laxative medication. Treatment for constipation is effective, although in some cases it can take several months before a regular bowel pattern is re-established. **Oedema** Swelling of the ankles and feet often occurs at the end of the day after a day of walking and standing. This gradual swelling is not harmful to the baby. However, if the woman experiences sudden swelling of the face, feet and fingers, contact the midwife immediately and check for other symptoms of pre-eclampsia. **Frequency of urine** If urinating hurts, itches or burns, the woman may have a bladder infection and will need antibiotic treatment.

Discussion points

1. Discussion of each problem, separating minor problems vs. major.
2. The need for health education and showing empathy to the woman suffering from these complaints.

The symptoms of heartburn can be like epigastric pain associated with pre-eclampsia. Exclude a diagnosis of pre-eclampsia by checking blood pressure and performing urinalysis and fetal growth measurements, checking for pre-eclampsia toxaemia symptoms (>20 weeks gestation) and screening bloods if indicated.

5.2: Myths and misconceptions of pregnancy

Resources	
■ Pens	■ Flip charts

Key teaching points

The purpose of this station is to discuss context specific common myths in pregnancy and common symptoms of pregnancy and how to manage them.

Key learning outcomes

- Understand the normal and abnormal symptoms of pregnancy.
- Understand the principles of evidence-based health education and health promotion.
- Understand the myths and misconceptions common in the local setting and how they can be detrimental to the mother and/or newborn baby.

Instructions

- Split the group into two or three smaller groups – ideally 3-4 participants in each group.
- Nominate someone to write on the flip chart for each group.
- Nominate someone in each smaller group to present their findings to the whole group during the open discussion.
- Ask each group to list the myths and misconceptions that they are aware of.
- Why do the myths and misconceptions continue to be believed?
- What are the potential complications associated with each?
- List how these practices can have a detrimental effect.
- Suggest ways of combatting encouraging the local population to discontinue these practices.

Discussion points

1. Importance of the healthcare provider in evidence-based health promotion and education.
2. How to combat cultural sensitive harmful practices?
3. Importance of community based education, involving local religious leaders, community health workers etc.

Examples of myths to discuss

Country	Possible myths
India	Women do not like to take iron supplementation as the medication is dark and they think it will cause the baby's skin to darken and the local preference is for babies with light colour skin.
China	There cannot be any sexual intercourse during pregnancy.
Cambodia	Fires are lit under the beds of women who have given birth. Women believe that they must have vitamin injections after they have given birth.
United Kingdom	Pregnant women can eat for two – and it will not impact on maternal and fetal outcomes. Cocoa butter prevents stretch marks. You cannot travel by air during your first or last trimester. Pregnant women must sleep on their left side. The baby's sex is indicated by its position in the womb.
Nigeria	Women use local medicine and consult local traditional healers. The use of cow dung for cord care which leads to tetanus.
Sudan	Female genital mutilation helps to control a women's sex drive.
Ethiopia	The insertion of rock salt into the vagina to tighten it.
India	Medicine delivered intravenously is better and more effective than orally.
East Africa	A woman experiencing a long and difficult labour may have her vagina packed with cow dung, which is meant to entice the baby out of the womb as it will smell how wealthy its father is.
Rural parts of India and Bangladesh	'Childbirth pollution' (relates to menstruation/lochia) has different consequences for a woman's experience, both during pregnancy and in childbirth. Pregnant women can be viewed as shameful, due to the evidence that they have had sex and the polluting acts of childbirth that follow. Women in these countries enlist the services of a dai to deal with it.

West Africa	Women must bear the pain of childbirth in silence to demonstrate their courage and character. There may be social pressure not to show any sign of pain, and labouring quietly and patiently is thought to demonstrate 'proper' modesty. In some settings, women are expected to give birth in silence and girls are taught that a woman who cries during childbirth is "lower than an ant". They are also expected to give birth alone.
Sierra Leone	A woman who is experiencing a difficult labour is being punished for something she has done wrong and needs forgiveness for labour to proceed.
Ghana	A woman experiencing a difficult labour will be suspected of infidelity.
Malaysia	It is believed that a woman experiencing a difficult labour must have offended her husband, and he needs to reassert his dominance over her so she can fulfil her womanly function of giving birth.

5.3: Screening and management of vaginal discharge and sexually transmitted infections

Resources	
■ Flip chart	■ Pens

Key teaching points

In this scenario, one of the Facilitators can play the woman. The other Facilitator will lead the participants. One of the participants will play role of the healthcare provider and conduct a full antenatal assessment of the woman. The expected actions of the participant and the outcome of the visit is outlined below. If the participants fail to undertake a full assessment of the woman as outlined below the Facilitator can lead them gently through the progress. Encourage discussion and teamwork.

Key learning outcomes

- Highlight the importance of sexually transmitted infection screening and follow-up, but also the importance of conducting a thorough sexual health history.
- Using compassionate, non-judgmental interviewing skills, the healthcare provider can get an accurate sexual history and gain an understanding of some of this woman's relevant health beliefs and practices.

History

A woman presents at the antenatal clinic, G2 P1 and asks you to do a pregnancy test and it is positive. During the physical examination, you find she has oral thrush, swollen lymph glands around the neck and foul smelling vaginal discharge. When taking her medical history, she says that she had painful blisters around her waist last year.

Expected actions

Facilitator:	What do they think is going on with this patient? What services are needed to be able to screen and treat for sexually transmitted infections?
Participant:	Trained healthcare providers to take a full sexual history Sexually transmitted infection exam Medications HIV counselling Confidential partner notification Contact tracing Sexual Health education Integration with other care services Follow up/review pathways

Facilitator:	What questions would you ask the woman?
Participant:	Respective care principles, ensure privacy and confidentiality Sensitively, take a full sexual history and ask when she had her last HIV test? Sexual history includes: Type of including type of relationship (polygamous, same sex/ heterosexual), type of sex (oral, anal, vaginal), number of sexual partners, type of protection (condoms), contraception use, use of sex aids, sexual intercourse and previous history of treatment for STIs, perineal hygiene e.g. douches, STI and ask when she had her last HIV test.
Facilitator:	In the privacy of the examination room, the woman tells the nurse about her sexual activity and comments that her boyfriend has been experiencing a penile discharge and is concerned that "he may have infected me with some disease." When questioned by the nurse, she states that she has experience some vaginal discharge, and itching.
Facilitator:	What would you look for on examination?
Participant:	Ensure consent and chaperone Visual appearance of the genital area and discharge and any associated smell
Facilitator:	Physical exam shows foul smelling vaginal discharge is present. What investigations would you like to do?
Participant:	For the vaginal discharge; Candidiasis in pregnancy Syphilis screen (RDT) Endocervical cultures for chlamydia, gonorrhoea and trichomoniasis For suspecting HIV, she needs a confirmatory HIV test and if HIV-positive she will need counselling on prevention of mother-to-child transmission, Viral load (if indicated) check and initiation of antiretroviral therapy.
Facilitator:	Given the following laboratory results, how would you manage/treat this woman? Syphilis — positive for this case negative Gonorrhoea culture — culture negative Chlamydia — culture positive Trichomoniasis — culture positive

Facilitator:	How would you treat? Mention that some settings without laboratory capacity utilise a syndromic approach to assessment and treatment of sexually transmitted infections.
Participant:	To treat the chlamydia and trichomoniasis: Azithromycin 1gm daily x 1 dose Metronidazole 500mg orally twice a day for 7 days The woman needs to refrain from any sexual activity until the treatment is completed, in one week's time. Recommend that she refer her sexual partner for treatment. Follow-up appointment for 2 months hence. And for syphilis Benzathine penicillin 2.4 million units (1.8g) IM. Give a single dose for primary syphilis, then to have a second dose after 7 days to be given as 2 injections in separate sites. Give once a week for 3 weeks for secondary syphilis. Benzathine penicillin 2.4 million units IM weekly for 3 weeks in late latent syphilis
Facilitator:	What advice would you give?
Participant:	Ensure follow-up of patient and of partner Talk about safer sex practices, condom use and negotiation. The topic of douching and use of bleach in the bath water. Educate about the health implications of these practices, including the risk that douching will increase susceptibility to infection because it causes inflammation of, or damage to, the mucous membranes and changes the pH of the vaginal secretions. Advise on long-lasting insecticide-treated bed nets, intermittent treatment for malaria, ferrous sulphate and good nutrition and follow-up antenatal care.

Discussion points

1. Importance of non-judgmental attitude of healthcare provider and obtaining a full history.
2. Importance of partner testing, contact tracing and counselling.
3. Discuss implications of untreated sexually transmitted infections on the mother and newborn.
4. Discuss the WHO syndromic approach to diagnosis and treat STIs.

5.4: Screening and management of psychosocial care in pregnancy

Resources	
■ HITS screening tool	■ Flip charts
■ Edinburgh Postnatal Depression Scale	■ Pens

Key teaching points

For the role play scenario, a Facilitator will act the role of the pregnant woman attending for care and a participant will play the healthcare provider taking the antenatal history. The setting is a crowded room with the midwife sitting at a desk beside the woman with a queue of other women seated on a bench close by the midwife's desk. The other participants in the group are observing but are encouraged to comment.

Key learning outcomes

- Understanding the interlinked approach to health: physical, psychological and social aspects.
- Understanding the principles of assessment, diagnosis, management of psychosocial issues during pregnancy.
- Understanding how to screen for psychosocial issues using the Whooley questions (Appendix 4) and Edinburgh Postnatal Depression Scale (Appendix 5).
- Understanding when and how to make a referral to a higher cadre of healthcare provider for support for psychosocial issues.

Mental health and domestic violence

Screening can occur at various times over the course of the pregnancy because some women do not disclose abuse the first time they are asked and abuse may begin later in pregnancy.

- At the woman's first visit with primary care
- At least once per trimester
- At the postpartum visit (usually 4 to 6 weeks)

HITS is an easy to use screening tool and scale that stands for Hurt, Insult, Threaten and Scream. The tool includes four questions that healthcare providers can provide to women via a questionnaire to assess risk for Intimate Partner Violence. The questions can also be asked verbally. (Refer to Appendix 6: HITS tool for domestic violence screening)

History

The Facilitator plays the roles of a pregnant woman who presents to antenatal clinic at in her first pregnancy at 35 weeks' gestation for a routine check-up. On questioning about how she feels, she breaks down and starts crying, saying she feels hopeless, cannot sleep and does not see any future for her and her baby. She explains that she attended for her visit a few months ago, for her booking visit and was diagnosed as HIV positive. Since her last visit, she disclosed her status to her husband. Her husband was very angry and cursed and screamed at her, accused her of being unfaithful and spread rumours in their community about her. Their relationship has broken down and she is staying with her sister's family at present. She has little access to money and cannot access medications.

Participant role (midwife)
The midwife is the only midwife in the clinic and there are at least 40 women waiting to be seen. To save time she is taking the women's history while the nursing assistant is taking the women's blood pressures.

Expected actions

Facilitator:	What further questions would you want to ask the woman regarding the physical and mental abuse?
Participant:	More details of the relationship? Any physical violence (HITS assessment tool). Has her husband ever been screened for HIV? What is the duration of her various symptoms, if any? Has she spoken to anyone about how she feels?
Facilitator:	How would you assess at the first visit?
Participant:	General assessment – look for signs of physical abuse. Physical/medical Check the results of other investigations. Assess fetal wellbeing. Check what medications she is taking. CD4 count Viral load Document the discussion in antenatal card Psychosocial The healthcare provider can ask questions about: ■ Past or present mental illness including depression, anxiety, schizophrenia, bipolar disorder, psychosis. ■ Previous treatment by a psychiatrist/specialist mental health team including inpatient care (if available) ■ A family history of perinatal mental illness. Other specific predictors, such as poor relationships with her partner, cannot be used for the routine prediction of the development of a mental disorder.

Facilitator:	How would you refer and initial care for this woman?
Participant:	If the healthcare professional or the woman has significant concerns, the woman can normally be referred for further assessment to a higher level depending on referral pathway. If the woman has, or is suspected to have, a severe mental illness (for example, bipolar disorder or schizophrenia), she can be referred to a specialist mental health service (if available). This can be discussed with the woman and her family. A written care plan covering pregnancy, delivery and the postnatal period can be developed for pregnant women with a current or history of severe mental illness, usually in the first trimester. The plan can: ■ Be developed in collaboration with the woman and her husband, family and carers, and relevant healthcare providers. ■ Include increased visits with specialist mental health services (including, if appropriate, specialist perinatal mental health services).
Facilitator:	What is your general plan to support this woman now and what follow-up does she need?
Participant:	Arrange for counselling and provide support Offer to speak to the family, husband to explain the HIV status Family support, extended family input Provision of accommodation/food Consider admission if the woman is deemed to be at risk of physical violence or if further counselling/assessment is required.
Facilitator:	What extra health promotion and advice is required?
Participant:	**Physical/medical** ■ Discuss mode of delivery in a secondary level healthcare facility ■ Attend early in labour ■ Check viral load ■ Discuss feeding options (exclusive breastfeeding or formula feeding) – no mixed feeding **Psychosocial** ■ Discuss the level of involvement of the woman's partner, family members and carers, and their role in supporting the woman ■ Explain the issues of stigma and shame in relation to mental illness if appropriate ■ Find group psychoeducation classes or start one

[!] Healthcare providers are in an unique position to support women experiencing domestic violence and mental ill health.

Discussion points

1. What support is available for women reporting domestic violence in your setting?
2. What do participants think of the screening tools and can they discuss how these questions would be accepted in their settings?
3. What is available for the treatment of depression, anxiety in your setting?
4. What is the psychological impact of HIV status on relationships and family?

Chapter 6: Medical conditions during pregnancy

6.1: Screening and management of anaemia and nutrition

Resources	
■ Body mass index calculator	■ Pregnancy wheel

Key teaching points

One Facilitator can play the pregnant woman. The other Facilitator can give the participants the history and ask them to deal with the woman as they would in a real-life situation. The expected actions of the participants and their outcomes for the Facilitator to feedback are listed below. If the participants are failing to deliver the expected treatment, guide them gently through the process. Encourage discussion and team work.

Key learning outcomes

- Carry out focused history and medical examination to screen and diagnose anaemia during pregnancy.
- Discuss the management of anaemia in pregnancy, the cause and degree of anaemia.
- Identify malnutrition in pregnancy to be able to take appropriate action.
- Discuss the causes of anaemia and malnutrition during pregnancy.

History

The woman is gravida 6, para 5. She arrives at the antenatal care clinic, presents for her first antenatal care visit at 20 weeks' gestation. She has 5 other children at home, all alive and has very little help to look after them. She complains of night sweats, feeling tired and weak and has not been able to eat properly for days. She has generalised body malaise and headache.

Expected actions

Facilitator:	What questions would you ask the woman?
Participant:	■ Introductions and welcome the woman using respectful maternity care. ■ Take an overview of the current pregnancy and ask specific questions concerning these symptoms. ■ What is the duration of her various symptoms? ■ Has she been treated with any medication? Is she taking any iron supplementation? ■ Is she living in a known malaria-endemic area? If yes, has she been treated for malaria recently and is she using a long-lasting insecticide-treated bed nets for herself and her children. ■ Is she experiencing any other symptoms, fever/sore throat/body rash?

Facilitator:	She is complaining of fever. She was treated for malaria one week ago, and does not have a long-lasting insecticide-treated bed net.
Facilitator:	What would you look for on examination?
Participant:	Prepare the woman for the examination ■ Head-to-toe, full antenatal examination. ■ Look for anaemia, check for dehydration ■ Pulse rate, respiratory rate, blood pressure, temperature, (all are normal) pallor, oedema, fetal heart (presence and rate) ■ Maternal weight and height measured – body mass index calculated (ideally from pre-pregnancy weight if known) ■ Calculate estimated date of delivery ■ To diagnose anaemia, take a detailed history and physical examination to identify symptoms and signs of anaemia and rule out the underlying causes
Facilitator:	What investigations can be done?
Participant:	Booking bloods and bloods to investigate anaemia which include the following ■ Blood for grouping ■ Rh factor ■ Blood glucose ■ Syphilis screening ■ HIV test ■ Hepatitis ■ Malaria 1. Haemoglobin and haematocrit estimation (to know degree of anaemia) 2. Full blood count and peripheral blood film (to know the type of anaemia, evidence of chronic infection or bleeding tendencies). 3. Stool examination for ova and cysts, 4. Blood Slide or rapid diagnostic tests for malaria diagnosis, urinalysis/microscopy, etc. (to know the cause of anaemia). 5. Screen for TB
Facilitator:	Physical examination normal. Test results: Hb result is 8.8g/dL, Malaria positive, body mass index of 18 All other tests are negative. What is the cause of anaemia and how are you going to treat this woman?

Participant:	**Cause of anaemia** 1. Iron deficiency (most common) 2. Malaria 3. Haemoglobinopathies 4. Depletion of iron stores – offer dietary advice 5. Depletion of folate stores because of inadequate diet **Treat for moderate anaemia** Oral iron and folic acid, counsel on compliance of treatment and common side-effects. Repeat Hb testing is required four weeks after commencing treatment to assess compliance, correct administration and response to treatment. **Malaria**, test was positive, treat according to local protocols. If possible, provide 3 long-lasting insecticide-treated bed nets, one for her and 2 for her family (5 children at home) **Educate** on the importance of eating foods containing iron such as green leafy vegetables, meat, liver, beans, fish, etc. (Prompt: the Facilitator needs to know which local sources of food rich in iron are available and affordable). **Malnutrition** The woman has signs of moderate malnutrition, if supplementary feeding program is available in the health centre, provide food supplementation. If not available, refer to an appropriate service. Next appointment can be in four weeks.
Facilitator:	During the next follow-up appointment at four weeks, there is no change in the Hb level, what will you advise? (Prompt: discuss compliance, alternative treatment)
Participant:	If anaemia persists, refer to secondary health care for further investigations.

Screening and management of anaemia at gestational age

- Screening can take place early in pregnancy (at the booking appointment) and at 28 weeks when other blood screening tests are being performed. This allows enough time for treatment if anaemia is detected.
- Hb levels outside the normal range for pregnancy (that is, 11g/dl at the first visit and 10.5g/dl at 28 weeks) can be investigated and iron supplementation considered if indicated.

A repeat Hb at 2 to 4 weeks is required to assess the response to treatment. The timing of further checks will depend upon the degree of anaemia and period of gestation. Once the Hb is within the normal range, treatment can be continued for a further three months.

[!] Referral to secondary care can be considered if anaemia is severe (Hb <70g/dl) and/or associated with significant symptoms or advanced gestation (>34 weeks).

Discussion points

1. Complications of anaemia including intrauterine growth restriction, preterm birth, increased vulnerability in the event of haemorrhage, particularly postpartum haemorrhage.
2. Groups at high risk of malnutrition in pregnancy.

6.2: Chronic/pre-existing hypertension during pregnancy

Resources	
■ Stethoscope	■ Flip charts
■ Blood pressure machine/cuffs	■ Pens

Key teaching points

The first part of this station requires the participants work in pairs, taking each other's blood pressure, using the appropriate cuffs. Ensure that all participants have an opportunity to practice.

During the second part, one Facilitator can play the role of a pregnant woman, the other Facilitator can give the participants the history, and ask them to deal with the woman as if in real life. The expected actions of the participants and the outcome from those for the Facilitator to feedback are listed below. If the participants are failing to deliver the expected treatment, guide them gently through the process. Encourage discussion and team work.

Key learning outcomes

- Practice the skills of monitoring of blood pressure during pregnancy and the sequelae of disease.
- Understanding the impact of chronic or pre-existing hypertension on pregnancy.
- Understanding the impact of pregnancy on hypertension.

History

The woman is a 42-year-old para 3+0 presenting at the booking clinic at 15 weeks. She had been diagnosed with hypertension one year ago, and was commenced on medication for this (Enalapril). She stopped taking the medication because she well. Her booking blood pressure is 158/95mmHg.

Expected actions

Facilitator:	What is the definition of chronic/pre-existing hypertensive disease?
Participant:	■ Hypertension first identified in early pregnancy ■ Hypertension that persists six weeks after childbirth **Chronic hypertension** is hypertension that is present at the booking visit or before 20 weeks or if the woman is already taking antihypertensive medication when referred to maternity services. It can be primary or secondary in aetiology.

Facilitator:	How can blood pressure be measured?
Participant:	Blood pressure must be measured in the sitting or semi-recumbent position. Validated equipment must be used. Discuss the advantages and disadvantages of manual and automated BP machines An appropriate sized cuff must be used – standard, medium and thigh cuffs must be available in all settings where blood pressure is measured.
Facilitator:	What are the definitions for high blood pressure in pregnancy?
	■ Hypertension is defined as a diastolic blood pressure greater than 90mmHg or a systolic blood pressure greater than 140mmHg. ■ Where the readings are less than 110mmHg or 160mmHg respectively then the measurement can be repeated no less than four hours later before a diagnosis can be made. ■ Where the readings are greater than 110mmHg or 160mmHg respectively no repeat blood pressure is required as this is considered diagnostic of hypertension.
Facilitator:	What would you like to do next?
Participant:	Determine if the case is an emergency. Take a further history to assess associated symptoms or signs relating to secondary causes, head-to-toe examination including searching for clues of secondary causes such as cardiac issues
Facilitator:	There are none of those findings. What investigations are relevant?
Participant:	Serum creatinine, urea, electrolytes. Specific organ assessment may need referral to a specialist healthcare provider.
Facilitator:	What are the complications of untreated hypertension on the mother?
Participant:	Stroke, heart disease, renal disease, pulmonary oedema, aortic dissection
Facilitator:	What are the complications of chronic hypertension to the pregnancy?
Participant:	Superimposed pre-eclampsia, small-for-gestational-age babies, placenta abruption, prematurity, intrauterine fetal death and perinatal deaths.

Facilitator:	What antihypertensive medications are you aware of and are they safe in pregnancy and what side effects are expected?
Participant:	1st line treatment: Methyldopa – Safe to foetus. May be associated with side effects in the mother of depression, sedation and postural hypotension. Most women become tolerant to this and will cope okay after the first week of initiating therapy. Side effects that may need a medication change include: liver function abnormalities and haemolytic anaemia. 2nd line treatment: Nifedipine. Safe to foetus. Side effects include headache, facial flushing, oedema, 3rd line treatment: Betablockers e.g. Labetalol is safe. Other beta blockers may be associated with intrauterine growth restriction/small-for-gestational-age babies

Discussion points

1. Drugs to be avoided in pregnancy or changed at the first visit (Facilitator to emphasise)
   Diuretics e.g. Lasix; ACE inhibitors e.g. ramipril, enalapril – can cause oligohydramnios, renal failure and fetal hypotension, skull structural malformations, Chlorothiazide and Angiotensin receptor blockers e.g. losartan can also be stopped.
2. Key messages:
   - □ Blood pressure control
   - □ Safety of medication in pregnancy
   - □ Co-manage with a specialist
   - □ Low dose aspirin has a role in preventing the complications of chronic hypertension and in the prevention of pre-eclampsia in women with risk factors
   - □ Advised to commence from 12 weeks until birth of the baby
   - □ Encourage women with chronic hypertension to keep their dietary sodium intake low, either by reducing or substituting sodium salt, because this can reduce blood pressure

6.3: Screening and management of diabetes during pregnancy

Resources	
■ Urine dipsticks	■ Pinard and doppler
■ Glucose test meter and sticks	■ Body mass index calculator

Key learning points

One Facilitator can play the pregnant woman; the other Facilitator can give the participants the history and ask them to deal with the woman as they would in a real-life situation. There are two case scenarios to work through in the time allocated. The expected actions of the participants and their outcomes for the Facilitator to feedback are listed below. If the participants are failing to deliver expected treatment, guide them gently through the process. Encourage discussion and team work.

Key learning outcomes

- Understand the presentation and management of gestational diabetes.
- Understand that diabetes may be asymptomatic.
- Understand the risk factors that predispose to diabetes in pregnancy.
- Understand the additional risks related to gestational diabetes and how these risks can be reduced.

History

Case 1

The woman is a 29-year-old Gravida 3. She is currently 28 weeks' pregnant. Her first pregnancy ended in stillbirth at 35 weeks when she presented in labour with no fetal heart rate. The baby weighed 3.5kg. Her second pregnancy resulted in the delivery of a 4.6kg baby at 39 weeks with shoulder dystocia and neonatal hypoglycaemia.

Expected actions

Facilitator:	What other information would you like to know from her initial history?
Participant:	Maternal height and weight to check body mass index. Any current symptoms of diabetes (polyuria, polydipsia)? Family history of diabetes?
Facilitator:	She has a raised body mass index of 40kg/m^2. What else would you look for on examination?
Participant:	Ensure consent, chaperone. Basic observations Excessive fundal height for gestation (large baby/polyhydramnios). Presence of fetal heart rate Glycosuria on dipstick testing

Facilitator:	What specific tests would you perform and when? What does the test involved and what results would you look for?
Participant:	Fasting blood sugar/glucose tolerance test without delay. The woman must fast overnight and then have initial blood sugar test flowed by a further blood sugar test 2 hours after the 75g oral glucose. A fasting plasma glucose level of 5.6mmol/L or above and/or a 2-hour plasma glucose level of 7.8mmol/L or above is an indication of gestational diabetes.
Facilitator:	What initial advice would you give?
	Review by multidisciplinary team if available (physician, obstetrician, midwife) Educate the woman regarding: □ Diet with reduced carbohydrate and appropriate exercise Use of food dairy □ Importance of good blood sugar control to reduce risks of macrosomia, birth trauma and need for Caesarean section, also neonatal hypoglycaemia and perinatal death □ Importance of regular blood sugar testing/self-testing □ Need for regular antenatal review/growth check □ Drug/insulin therapy likely to be required if blood sugars remain outside normal range after 1-2 weeks

It is important to recognise the risk factors for diabetes as otherwise the woman may be asymptomatic.

Risk factors in this case were:
- High body mass index >30kg/m^2
- Unexplained pregnancy loss in third trimester
- Previous large baby >4.5kg
- Previous shoulder dystocia
- Neonatal hypoglycaemia

Discussion points
1. Should she have been screened during the second pregnancy?
2. How could shoulder dystocia have been avoided in second pregnancy?
3. How reliable are urine dipsticks in screening for diabetes?

Case 2

The woman is a 25-year-old primigravida. Because of persistent glycosuria +++, she underwent a glucose tolerance test at 26 weeks' gestation when her fasting blood sugar was found to be 7.7mmol/L and 2 hours after a 75g glucose load blood sugar was 12.2mmol/L. She did not attend for the results or for antenatal care afterwards but has attended now at 32 weeks.

Expected actions

Facilitator:	What concerns do you have about the pregnancy?
Participant:	Risk factors increase with poor control, especially: Fetal macrosomia and birth difficulties Unexplained fetal death Neonatal hypoglycaemia
Facilitator:	How would you advise the woman regarding the remainder of the pregnancy?
Participant:	Re-educate similarly to recommendations in Case 1, emphasising: Importance obtaining good control through diet/medication to reduce risks Need for regular review and testing/self-testing Fetal macrosomia causes additional risks at delivery The possible need to commence treatment (metformin/insulin) immediately
Facilitator:	What plans would you make for delivery?
Participant:	Discuss mode of delivery at the antenatal clinic visit at 36 weeks. Induction of labour can be offered at 38+ weeks, with delivery no later than 40 weeks The most senior healthcare provider can make the decision regarding induction, considering the balance of risks versus benefits of the induction process.

Discussion points

1. Education is not a 'one-off' process – the lessons may need to be given repeatedly and emphasised at each visit.
2. Lack of symptoms is not evidence of wellbeing.
3. Most problems during pregnancy, delivery and neonatally can be prevented by good diabetic control and appropriate planning.
4. Why would the women have been reluctant to attend after the glucose tolerance test?
5. What can be done to minimise risks in women who do not engage with the appropriate levels of care required?

FACT BOX

Risk factors for Diabetes:

- Body mass index >30kg/m^2 at booking visit
- Previous baby weighing >4.5kg
- Previous gestational diabetes
- First degree relative with diabetes

Glycosuria may indicate diabetes but the 2 hour 75g oral glucose tolerance test is the appropriate diagnostic test.

- Where possible, a team consisting of an Obstetrician, Physician and Midwife should be regularly involved in care.
- Some women achieve control with diet and exercise but may require medication (Metformin/insulin).
- Regular post prandial blood sugar monitoring is essential with regular review.
- Delivery indicated after 39 weeks, though delivery can be delayed if regular tests of fetal wellbeing are performed.
- Caesarean section may be considered on an individual basis if baby large (>4.5kg) or previous shoulder dystocia.
- Many women will have increased risk of developing gestational diabetes in future pregnancies.
- May also develop Type 2 diabetes in later life.

6.4: Management of respiratory disorders during pregnancy

Resources	
■ Flip Chart	■ Pens

Key teaching points

Explain that this station is about the management of asthma, which is one of the main respiratory conditions which may improve or worsen in pregnancy. One Facilitator can play the pregnant woman; the other Facilitator can give the participants the history. The expected actions of the participants and their outcomes for the Facilitator to feedback are listed below. If the participants are failing to deliver expected treatment, guide them gently through the process. Encourage discussion and team work.

Key learning outcomes

- Understand the complications associated with asthma during pregnancy.
- Understand the appropriate drug management for asthma control.

History

The woman is a 21-year-old primigravida. She had asthma as a child but has not required regular treatment for about 2 years. She has recently moved to a new house following her marriage 6 months ago, and carries a salbutamol inhaler which she uses occasionally. She is currently 16 weeks pregnant and complains of wheezing and feeling short of breath.

Expected actions

Facilitator:	What do you think could be going on with this woman?
Participant:	It could be: ■ Asthma ■ Normal physiological response to pregnancy ■ Other respiratory disease including TB ■ Heart disease ■ Anaemia ■ Always consider the possibility of HIV/Malaria
Facilitator:	How can her symptoms be reliably diagnosed as asthma?
Participant:	Description of her symptoms – wheezing, tightness and cough with worsening at night. Absence of other possible causes of breathlessness.
Facilitator:	What could be making her asthma worse?
Participant:	Pregnancy makes it worse in one third of cases. Respiratory viral infections are the most common cause of worsening asthma.

Facilitator:	How can her asthma be managed during pregnancy?
Participant:	Avoidance of obvious trigger factors such as allergens. Use of appropriate medication: Start with inhaled Beta 2 agonist and add inhaled steroids as the next step. Oral steroids can be added if asthma persists. Obtain control and continue regular therapy to avoid deterioration Do not stop treatment when improvement is obtained. Refer for any acute exacerbations or if wheezing persists.
Facilitator:	Are there any specific precautions to take during labour?
Participant:	Severe reactions are rare during labour. Women on oral steroids may require hydrocortisone in labour.

Discussion points

1. All breathlessness is not asthma, other causes of breathlessness may present as asthma, trigger factors can be understood and avoided where possible.
2. Management depends on the severity of the condition but can continue, even if symptoms improve.
3. Asthma drugs are generally safe during pregnancy; women can continue treatment after symptoms improve.
4. A peak expiratory flow rate meter, if available, is a helpful and portable aid and may provide reassurance to the woman.
5. Good asthma control usually results in a good pregnancy outcome.
6. Management of asthma depends on finding an appropriate level of medication, starting with inhaled Beta 2 agonists, and continuing this through pregnancy even if symptoms improve.
7. Deterioration can be managed by adding inhaled or oral steroids.
8. Inhaled medications are safe for breastfeeding.
9. It is safer for pregnant women with asthma to be treated with asthma medications than it is for them to have asthma symptoms and exacerbations.
10. Acute exacerbations of asthma require referral for more intensive management.

Chapter 7: Infections during pregnancy

7.1: Sepsis of unknown origin in pregnancy

Resources	
■ Rapid diagnostic test	■ Cotton wool
■ Non-sterile gloves	■ Thermometer
■ Sharps container	

Key teaching points

Explain that this station is about managing a woman with sepsis. One Facilitator can play the pregnant woman, the other Facilitator can give the participants the history and ask them to deal with the woman as they would in a real-life situation. Point out to the participants that there is equipment available on an adjacent table for them to use. The expected actions of the participants and their outcomes for the Facilitator to feedback are listed below. If the participants are failing to deliver the expected treatment, guide them gently through the process. Encourage discussion and team work.

Key learning outcomes

- Understand the presentation, diagnosis and complications of women with sepsis of unknown origin during and after pregnancy.
- Understand the causes of sepsis in women during and after pregnancy.
- Understand the role of Systematic inflammatory response syndrome (SIRS) as a screening tool.
- Understand the role of antenatal and postnatal care in preventing the development of sepsis.

History

A 26-year-old woman with three children. She is at 34 weeks' pregnant based on the dates of her last menstrual period. She presents to the antenatal clinic with frequency of micturition and dysuria. On examination, her pulse is 100bpm, her temperature is 37.5°C. Urinalysis shows leucocytes and nitrites.

Expected actions

Facilitator:	1. Ask the participant to summarise case findings. 2. After this has been done, ask "What would you do next?". 3. What questions would you want to ask the woman?
Participant:	Full systematic obstetric and medical history: ■ Does she feel generally unwell? ■ For how long has she experienced the symptoms? ■ Any associated symptoms e.g. fever, vomiting? ■ Check her HIV/Malaria/TB status? ■ Can she feel fetal movements? ■ What is the duration of her various symptoms? ■ Has she been treated with any medication?

Facilitator:	What would you look for on examination? Emphasise the need for head-to-toe examination. Ask participants to demonstrate a head-to-toe examination on the woman.
Participant:	**Primary assessment** If she is unwell, direct admission and referral to higher level cadre of healthcare provider **Secondary assessment** ■ General assessment: pallor, oedema ■ Basic observations: pulse rate, respiratory rate, blood pressure, temperature, oxygen saturation ■ Obstetric assessment: symphysis-fundal height, fetal heart (presence and rate), tenderness, contractions
Facilitator:	What investigations would you like to do?
Participant:	■ Full blood count (or Hb if a full blood count is not possible) ■ Urinalysis and midstream urine sample ■ Rapid diagnostic test for Malaria, thick film ■ HIV and syphilis rapid diagnostic tests ■ Blood sugar ■ White blood cell count, C-reactive protein and lactate if available ■ Candida in pregnancy
Facilitator:	Which tests do you send the bloods and urine for? How soon will the results be available? What tests are available locally? Ask participants what they think is going on diagnostically – expect or prompt them to draw the conclusion that the woman has an infection.
Facilitator:	What is your differential diagnosis? Can you list all the various causes of sepsis during pregnancy?
Participant:	■ Cystitis ■ Pyelonephritis ■ Chorioamnionitis ■ Malaria ■ Typhoid or non-typhoid salmonellosis ■ Hepatitis ■ Chest infection (pneumonia, TB, pneumocystis) ■ Other: appendicitis, meningitis

Facilitator:	During the demonstration of head-to-toe examination, the woman has mild loin tenderness. What would you do now?
Participant:	Commence treatment according to local guidelines: 1. Supportive treatment: paracetamol. 2. Commence oral antibiotics: cephalosporine or a combination of antibiotics depending on local guidelines. 3. If basic observations more serious, for admission for further investigations, resuscitation and intravenous antibiotics.
Facilitator:	What are the complications of untreated urinary tract infection?
Participant:	Maternal sepsis, septic shock Preterm labour, fetal sepsis, fetal distress, intrauterine death

Discussion points

1. Discuss what is done in the participants' healthcare facility when a woman presents with fever at 34 weeks.
2. If there is sufficient time, it is good to re-enact this scenario with a different diagnosis in mind, and ask different participants to act out the assessment of the woman.
3. Choose one of the conditions mentioned as occurring locally and/or one that occurs less frequently e.g. meningitis, appendicitis.
4. In cases of recurrent pyelonephritis, consider prophylaxis with antibiotics during pregnancy.
5. Cultures cannot usually be taken but urine microscopy can usually be performed. Discuss what laboratory tests are available.
6. Note that pyelonephritis is a clinical diagnosis (loin tenderness, high fever) and does not need laboratory tests if they are not available.
7. Discuss common causes of fever locally; consider over-diagnosis of malaria (commonly the only presumptive diagnosis made is one of malaria and treatment for this only in the first instance is common practice).
8. Consider other causes of fever in pregnancy specifically, including chorioamnionitis, pyelonephritis.
9. Confirm who can prescribe and/or give oral antibiotics.
10. If there is time, discuss the differential diagnosis of fever in women who are HIV-positive and are pregnant (this is also covered in Chapter 7.2).

The Systematic inflammatory response syndrome can to use to define early infection as the presence of two or more of the following:

- Temperature (>38°C or <36°C)
- Pulse rate (>90bpm)
- Respiratory rate (>20 respirations per minute)
- Abnormal white blood cell count (<4 or >12 10^9/L)

If the women scores >2 on the scale above, the women can be assessed further using a full systematic symptom screening and the conjunctiva, sclera, breast, heart, chest, abdomen (general and obstetric) can be examined. Inspection of the perineum and/or speculum examination can be conducted if clinically indicated (for symptoms of vaginal discharge, bleeding, pain). Urinalysis can be performed using Multistix® GP and sent for full culture and microscopy if indicative of a urinary tract infection. Blood will be taken for full blood count, lactate, biochemistry profile, blood culture, malaria, syphilis and HIV. Sputum can be tested for TB using GeneXpert.

FACT BOX

- Sepsis in pregnancy remains an important cause of maternal death.
- Substandard care was identified in many of the cases, lack of recognition of the signs of sepsis.
- Survival rates following sepsis are related to early recognition and initiation of treatment.
- Sepsis may be defined as infection plus systemic manifestations of infection.
- Severe sepsis may be defined as sepsis plus sepsis-induced organ dysfunction or tissue hypoperfusion.
- Septic shock is defined as the persistence of hypoperfusion despite adequate fluid replacement therapy.
- Clinical observations (pulse rate, respiratory rate, blood pressure, and oral temperature) are easy to measure and give a lot of clinical information.

7.2: Management of HIV during pregnancy

Resources	
■ Flipchart	■ Pens

Key teaching points

It is suggested that this is run as a group discussion. Try to include all members of the group in the discussion. The room can be laid out with semi-circular seating to aid discussion. It is important to emphasis the factors related to initiation of therapy, drug management, obstetric interventions aimed at reducing (eliminating) mother-to-child-transmission of HIV and healthcare provider infection prevention measures.

Key learning outcomes

- Know the measures for the prevention (elimination) of mother-to-child-transmission of HIV.
- Understand the initiation and continuation of antiretroviral treatment.
- Apply prevention of exposure risk and post exposure prophylaxis for healthcare workers.
- Discuss healthcare provider misconceptions and prejudices that may be barriers to provision of high quality care.

Instructions

Case scenario 1: Obstetric procedures to reduce the risk of maternal-to-child-transmission of HIV, mode of delivery

The woman has recently been diagnosed as HIV positive and is booked to deliver at a large referral hospital in the capital city, attends antenatal clinic at 37 weeks' gestation to discuss mode of delivery.

Facilitator:

- This is a group discussion that will start by asking participants to share their experiences of managing this case.
- How would you advise the woman?
- Participants are expected to discuss the delivery and care options for the woman.

Facilitator: Briefly discuss the WHO clinical staging of HIV/AIDS – emphasise that as per new guidelines, initiation of therapy is for all women irrespective of WHO clinical stage of disease or CD4 count. '' HAART for all, for life approach''.

There is no added advantage to offering elective Caesarean section to women with low/ suppressed viral load. The WHO states that elective Caesarean cannot be routinely provided for women who are taking antiretroviral therapy and have HIV-RNA levels of less than 1000 copies/ml unless they choose this procedure after appropriate counselling. They also suggest that elective Caesarean could be offered by clinics that have the necessary resources and can be recommended for women who are on antiretroviral therapy and have HIV-RNA levels of above 1000 copies/ml near the time of delivery.

Countries are encouraged to increase coverage and strengthen programs so that women can start antiretroviral therapy early and achieve a good level of viral suppression by the time of delivery. As with women not infected with HIV, episiotomy must be reserved for cases of clear obstetric indication due to the increased risks of mother-to-child-transmission and accidental infection of the birth attendant. Invasive procedures such as fetal blood sampling are contra-indicated.

Case scenario 2: Antenatal care: antiretroviral therapy to reduce the risk of mother-to-child-transmission of HIV

The woman is 20 weeks pregnant with her first baby and has been found to be HIV positive on routine testing, with a CD4 count of 200 cells/μL. She has had counselling regarding her HIV status but still requires antiretroviral therapy prescribing.

Facilitator:

- Ask the group to share their experiences of managing HIV patients regarding antiretroviral therapy regimes. What drugs have they prescribed before? What were some of the problems?
- Ask the group to make a list of antiretroviral drugs used in pregnancy and indicate which are available to healthcare providers at which level of healthcare provision. Should you initiate treatment?

Discuss the new WHO guidance HAART for all, for life approach.

Discuss with the participants that the transmission risk without prevention of mother-to-child-transmission is 30-40%, with Nevirapine (NVP) only, this is reduced by 50%. Triple antiretroviral therapy can reduce this risk further to below 2% if started during pregnancy. Participants can discuss the different regimens available in their respective countries.

Facts to guide the discussion:

- All HIV infected pregnant women can be commenced on antiretroviral therapy for their own health and given effective ARV prophylaxis to prevent transmission of HIV to the infant.
- ARV prophylaxis can be started from as early as 14 weeks' gestation or as soon as possible thereafter.
- ART can be initiated in all pregnant and breastfeeding women living with HIV, regardless of gestational age, WHO clinical stage and at any CD4 count, and continued lifelong.
- There are national guidelines for each country which have usually been developed/adapted from the WHO guidelines.

Drug abbreviations

AZT	Zidovudine
NVP	Nevirapine
Sd-NVP	Single dose Nevirapine
LVP/r	Lopinavir/Ritonavir
ABC	Abacavir
3TC	Lamivudine
EFV	Efavirenz
TDR	Tenofovir
FTC	Emtricitabine

Recommended treatment regimens include:

- AZT + 3TC +NVP
- AZT + 3TC + EFV
- TDF + 3TC (or FTC) +EFV
- TDF + 3TC (or FTC) + NVP

Infants born to women taking antiretroviral therapy for their own health can receive:

- Daily NVP or AZT from birth until 6 weeks of age

For mothers on antiretroviral therapy, infant prophylaxis provides added early postpartum protection, especially for mothers who start antiretroviral therapy late, have less than optimal adherence and have not achieved full viral suppression.

Infants born to women who are high risk:

- On ART less than 4 weeks
- Viral load > 1000 copies
- Infected with HIV during pregnancy or in the postnatal period

Should receive 6 weeks of dual prophylaxis with AZT (twice daily) and NVP (once daily) for the first 6 weeks of life and if breastfeeding should continue infant prophylaxis for an additional 6 weeks (12 weeks in total).

Other issues

There is evidence that infants born to women with HIV were more likely to have intrauterine growth retardation, preterm delivery and low birth weight. Some studies also suggested an increased risk of spontaneous abortion and stillbirth. These outcomes were more likely among women with symptomatic HIV infection. Women with HIV are also at greater risk of malaria and anaemia and anti-malarial treatment is likely to be less effective.

WHO recommended options (maternal prophylaxis plus infant):

Option B+: Maternal triple ARV prophylaxis	
MOTHER	**INFANT**
Triple ARV lifelong - AZT + 3TC + LPV/r - AZT + 3TC + ABC - AZT + 3TC + EFV - TDF + 3TC (or FTC) + EFV	Breastfeeding infant AZT or NVP from birth until 6 weeks Non-breastfeeding infant AZT or NVP from birth until 6 weeks

7.3: Management of Malaria during pregnancy

Resources	
■ Rapid diagnostic test	■ Sharps container
■ Non-sterile gloves	■ Cotton wool

Key teaching points

One Facilitator can play the pregnant woman and the other Facilitator can give the participants the history and ask them to deal with the woman as they would in a real-life situation. The expected actions of the participants and their outcomes for the Facilitator to feedback are listed below. If the participants are failing to deliver the expected treatment, guide them gently through the process. Encourage discussion and team work.

Key learning outcomes

- Understand the clinical presentation, diagnosis and complications experienced by pregnant women with malaria.
- Understand the likely different clinical presentations in areas of stable and unstable transmission.

History

The woman is a 19-year-old primigravida woman. Her last menstrual period was 26 weeks ago, she lives an area with stable (endemic) malaria transmission. She presented to the antenatal clinic for the first time and on examination has very pale conjunctivae and reports feeling tired all the time and has become increasingly more breathless, especially on walking uphill.

Expected actions

Facilitator:	What questions would you want to ask her?
Participant:	Introductions using respectful maternity care principles ■ Is she experiencing fever? ■ Does she know if she has previously been diagnosed as having malaria? ■ Can she feel fetal movements? ■ What is the duration of her symptoms? ■ Has she been treated with any medication?
Facilitator:	What would you look for on examination?
Participant:	Ensure privacy, consent, chaperone Pulse rate, respiratory rate, blood pressure, temperature, (all are normal) pallor, jaundice, oedema, fundal height, fetal heart (presence and rate)

Facilitator:	What investigations can be done?
Participant:	Full Blood Count (or Hb if a full blood count is not possible), rapid diagnostic test for Malaria, thick/thin film, midstream urine sample, HIV and syphilis tests, blood sugar and blood group and save (in case of transfusion).
Facilitator:	What is your differential diagnosis? Discuss various causes of anaemia, including malaria. If this is a case of malaria, what complications might you expect?
Participant:	Fetal growth retardation, intrauterine fetal death, maternal heart failure from severe anaemia, increased risk of haemorrhage, cerebral malaria, renal failure.
Facilitator:	How are you going to treat this woman?
Participant:	Oral anti-malarials and oral iron supplementation.

Discussion points

1. Discuss the issue of placental sequestration of infected red blood cells.
2. Explain that in areas of stable high transmission, women may be asymptomatic due to their relative immunity but that they can become severely anaemic and that there are potentially poor fetal outcomes due to placental sequestration.

7.4: Management of Tuberculosis during pregnancy

Resources	
■ Containers for sputum	■ Permanent marker pens
■ Disposable gloves	

Key teaching points

For the role play scenario, a Facilitator can play the role of the woman and a participant can be the midwife taking the antenatal history. The setting is a crowded room with the midwife sitting at a desk beside the woman with a queue of other women seated on a bench close by the midwife's desk. The other participants are observing but may be encouraged to make comments.

Key learning outcomes

- Understand the presentations and complications of pregnant women with TB.
- Understand the different screening and testing options available for diagnosing TB in pregnancy.

History

Facilitator role (pregnant woman)

The Facilitator can play the role of a pregnant 18-year-old woman, recently married, who attended the antenatal clinic for the first time at 24 weeks' gestation. Her body mass index is 16. She reports having weighed more previously but has progressively lost weight which she attributed to nausea and vomiting during the first trimester of pregnancy; however, this has continued into the second trimester and she is very concerned about it.

Facilitator:	How will you clinically assess this woman?
Participant:	Ask about her feeding pattern and weight loss history.
Facilitator:	I have had normal frequency and amount of a balanced diet.
Participant:	Directly ask about other symptoms – cough, night sweats.
Facilitator:	Yes, I have had a cough for four weeks which I have been taking some honey for. It is getting worse over time and I am getting breathless. I have been sweating overnight, drenching the bed sheets.
Participant:	What other medical problems do you have? Are you taking any other medications?
Facilitator:	None

Facilitator:	Who do you live with at home and are they all healthy?
Participant:	My husband works away and comes home over the weekend. He is being treated for TB.
Facilitator:	What do you think explains her weight loss and how do we proceed?
Participant:	Test the women for TB. Send sputum samples x3 for Ziehl Nielsen stain, TB culture and sensitivity.
Facilitator:	Her HIV is negative, malaria negative and TB positive.
Participant:	The woman needs for the immediate initiation of treatment and case reporting as per local surveillance mechanisms.
Facilitator:	What treatment would you offer this woman?
Participant:	■ Isoniazid ■ Rifampicin ■ Ethambutol ■ Pyrazinamide ■ Streptomycin Women can be counselled regarding compliance and if symptoms worsen to contact a healthcare provider as soon as possible.
Facilitator:	What factors can complicate TB in pregnancy? Would you want to perform any other screening?
Notes:	Stigma associated with TB may create issues with women accessing antenatal care. It is important women are counselled regarding importance of regular antenatal care to prevent complications with the newborn baby. Co-morbidities: all women can be screened for HIV Previous treatment of TB Multidrug resistant TB

Discussion points

1. This woman needs to be counselled regarding the need for TB testing in addition to routine antenatal care.
2. Discuss rapid diagnostic testing using a TB GeneXpert® test.
3. Immunosuppression is a predisposing factor for TB infection, offer HIV testing.
4. Reflect on the complications of TB infection in pregnancy for both the mother and the baby.

FACT BOX

Tuberculosis (TB) is a chronic infectious disease caused by Mycobacterium tuberculosis, an acid-fast rod-shaped bacillus.

- Over 90% of new TB cases and deaths occur in low resource settings.

TB is one of the leading infectious causes of morbidity and mortality among women of reproductive age. Pregnancy, labour and the postpartum period provides a unique opportunity for TB screening and management.

Effect of Pregnancy on TB:

- The diagnosis of TB may be delayed in pregnancy. Pregnant women with pulmonary TB are more likely to be asymptomatic at the time of diagnosis, compared with non-pregnant women with pulmonary TB.
- They are also more likely to have non-specific symptoms and to experience a delay in obtaining a chest x-ray. The clinical manifestations of pulmonary TB, if present, are the same as in non-pregnant women.

Effect of TB on pregnancy:

- Outcomes of pregnancy are rarely altered by the presence of TB except in the rare cases of congenital TB.
- However, untreated TB represents a far greater hazard to a pregnant woman and her foetus than the treatment of the disease which can lead to: pregnancy wastage, low birth weight, preterm delivery, intrauterine fetal death, increased neonatal mortality rate, maternal morbidity and mortality.

Chapter 8: Maternal obstetric conditions

8.1: Pregnancy-induced hypertension: diagnosis and management

Resources	
■ Stethoscope	■ Cushions
■ Sonicaid	■ Patella hammer
■ Blood pressure cuff (different sizes)	

Key teaching points

The purpose of this workshop is to discuss the presentation and management of pregnancy-induced hypertension and pre-eclampsia in an outpatient setting. It is suggested that one of the Facilitators acts as the pregnant woman, who is attending antenatal clinic at the healthcare facility but feels that she is not unwell and does not understand why she needs to take medication. The other Facilitator can give participants the case history and findings, ask them to repeat back the details and then ask them to manage the pregnant woman as if in real life. The expected actions of the participants and their outcomes for the Facilitator to feedback are listed below. If the participants fail to deliver the expected treatment, guide them gently though the process. Other members of the group can act as assistants. Encourage team work.

Key learning outcomes

- Screen for and diagnosing and differentiating between pregnancy-induced hypertension and pre-eclampsia.
- Initiate and monitor treatment for pre-eclampsia toxaemia.

History

The woman is aged 28 years (G6, P5) who is 32 weeks pregnant and has presented to the antenatal clinic for routine antenatal care. The healthcare provider from the antenatal clinic reports that her blood pressure is 148/96mmHg.

Facilitator:	Why should we screen for hypertensive disorders in pregnancy?
Participant:	■ For early and timely intervention, to avert perinatal morbidity and mortality. ■ As part of strategies aimed at reducing stillbirths. ■ Improve identification of women at risk and improve standards/ quality of care to prevent perinatal morbidity and mortality.
Facilitator:	Ask participant to summarise case findings. After this has been done, ask: How would you approach this woman? What would you do next? What questions would you want to ask this woman?
Participant:	■ Take a detailed case history including previous medical and obstetric history ■ Family history of hypertension ■ Ask about the gestational age ■ Full systematic obstetric and medical history? ■ Does she feel generally well? ■ Are there any associated symptoms? ■ Check details of her antenatal care to date ■ Maternal wellbeing ■ Check her HIV/Malaria/TB status ■ Fetal movements? ■ Has she had any vaginal bleeding? ■ Has she been treated with any medication? ■ Consider screening for depression/domestic violence
Facilitator:	Based on the blood pressure, what symptoms do you want to screen for?
Participant:	Ask the participants to ask specific questions about her symptoms. Questions can specifically include: ■ Do you have a headache? ■ Do you suffer from visual disturbances? ■ Do you have any upper abdominal pain? ■ How are the fetal movements?
Facilitator:	What examinations would you undertake? Emphasise the need for head-to-toe examination. Ask participants to demonstrate a head-to-toe examination of the woman.

Participant:	Ensure privacy, consent, chaperone Primary assessment If unwell, direct admission and referral to a higher-level cadre of healthcare provider. Secondary assessment General assessment including signs of pre-eclampsia: ■ Generalised oedema including face and hands ■ Headache ■ Visual disturbance ■ Epigastric pain Basic observations: pulse rate, respiratory rate, blood pressure, temperature Chest and heart examination Check reflexes and clonus Ensure this is a complete examination.
Facilitator:	On examination, you find the woman to have a blood pressure of 155/100mmHg, no hyper-reflexes and no clonus. The fetal heart rate is 120bpm and regular. All other clinical observations are normal. What would you do? What investigations would you like to do?
Participant:	Full blood count, urea and electrolytes, urate, liver function tests (Transaminases) Urinalysis and midstream urine sample Coagulation screen, if the platelet count <100 Expect haemoglobin or urea and electrolytes (usually cannot be done but, if possible to do full blood count then platelet count is important). Rapid diagnostic test for Malaria, thick film Rapid diagnostic tests for HIV and syphilis
Facilitator:	For which tests can the bloods and urine be sent? ■ What tests are available locally? ■ Discuss if it is possible to test for urea, creatinine, liver enzymes (ALT) and/or urinary protein creatinine ratio. ■ How soon will the results be available? ■ Briefly discuss possible results. Tell the participant that there is no proteinuria in the urine. Ask participants what they think is going on diagnostically – expect or prompt them to draw the conclusion that the woman has pregnancy-induced hypertension.

Facilitator:	How are you going to manage this woman?
Participant:	Start oral antihypertensive treatment if diastolic is greater than 100-105mmHg or systolic greater than 150-155mmHg. Oral hypertensive treatments: ■ Methyldopa ■ Nifedipine ■ Labetalol Weekly blood pressure and proteinuria check Monitor maternal symptoms Monitor fetal growth
Facilitator:	When will you deliver this woman?
Participant:	If the condition does not worsen, surveillance to term (37 completed) weeks then consider inducing labour or Caesarean section if there are other obstetric risk factors. If born preterm or if by Caesarean before 39 weeks, consider antenatal corticosteroids. If she develops pre-eclampsia, the decision depends on the severity; otherwise. it depends on the response to treatment.
Facilitator:	What are the complications of untreated pregnancy-induced hypertension?
Participant:	Pre-eclampsia Eclampsia HELLP syndrome
Facilitator:	The woman is commenced on Methyldopa with good control. She is discharged for outpatient follow-up. During the second week, at 34 weeks' gestation, she has a blood pressure of 145/95mmHg and 3+ proteinuria What is the diagnosis and what do you do next?
Participant:	She now has pre-eclampsia. Repeat the clinical assessment as for pregnancy-induced hypertension, enquiring about symptoms suggestive of maternal organ system involvement and fetal wellbeing. Laboratory investigations for organ involvement.

Facilitator:	Your assessment reveals no additional symptoms, normal fetal movements, normal urea and electrolytes, liver function tests, uric acid and normal reflexes. How do you manage this woman?
Participant:	Recognise that she is now classed as mild pre-eclampsia due to proteinuria. No change to current medication. Educate the woman on the clinical signs of severe pre-eclampsia toxaemia. Increased surveillance of blood pressure, proteinuria and blood investigations to assess deterioration twice weekly.
Facilitator:	When do you consider referral to a higher-level healthcare facility or healthcare provider?
Participant:	■ Uncontrolled blood pressure requiring Intravenous antihypertensive (discuss those available – Hydralazine or Labetalol). ■ When anticipating delivery or when faced with complications e.g. severe pre-eclampsia, eclampsia or HELLP syndrome. ■ Uncontrolled blood pressure can cause raised intracranial pressure, intracranial haemorrhage (stroke) and heart failure.

Discussion points

1. The spectrum of hypertensive disease in pregnancy and possible complications if untreated.
2. The need to optimize fetal maturity and time delivery to the best benefit of mother and newborn. Without early ultrasound, pregnancy dating and timing of interventions is a challenge.
3. Explain that it might be necessary to give some drugs before delivery which will optimise the newborn's lung function once born (corticosteroid usually for pregnancies less than 34-36 weeks).
4. Low dose aspirin (75mg) as from 12 weeks to term has a role in prevention of pre-eclampsia.

8.2: Management of antepartum haemorrhage

Resources	
■ Stethoscope	■ Vaginal speculum
■ Pinard	■ Blood pressure cuff
■ Cannula	■ Urinary catheter

Key teaching points

One of the Facilitators can play the woman. One of the participants can play the role of the healthcare provider and conduct a full antenatal assessment of the pregnant woman. The expected actions of the participant and outcome of the visit is outlined below. If the participants fail to undertake a full assessment of the woman as outlined below, the Facilitator can lead them through the progress. Encourage discussion and teamwork.

Key learning outcomes

- Understand the importance of a systematic, logical, consistent, evidence-based approach to antepartum haemorrhage.
- Understand the possible causes of antepartum bleeding.
- Describe how to manage a pregnant woman with antepartum haemorrhage and/or refer to comprehensive obstetric care units.

History

A 26-year-old woman, 37 weeks into her second pregnancy presents to your basic emergency obstetric care unit. She tells you that her first pregnancy was uncomplicated. In this pregnancy, she had been experiencing vaginal spotting after intercourse but today she had a heavier than usual bleed after intercourse. What steps would you take to deal with this?

Expected actions

Facilitator:	The woman introduces herself to you and gives you a comprehensive history. How are you going to assess this woman?
Participant:	Introductions using respective maternity care principles Ensure privacy, consent, chaperone I would like to check her vital signs, blood pressure, pulse rate, temperature, respiratory rate.
Facilitator:	Her temperature is 37.4°C, blood pressure 110/70mmHg, respiratory rate 14, pulse rate 75bpm. What else would you like to check?
Participant:	Auscultate the fetal heart rate.
Facilitator:	A doppler is available to auscultate the fetal heart rate.
Participant:	Listen to the fetal heart rate.

Facilitator:	The fetal heart rate is 155bpm, regular with no obvious decelerations. Did you note anything else during that examination?
Participant:	Lie and presentation of the baby. Feel of the uterus.
Facilitator:	Longitudinal lie with the head presenting. The uterus is not tender or hard and there are no contractions. Do you think the circulation is compromised here?
Participant:	No, clinical observations are normal.
Facilitator:	Is she in shock?
Participant:	No, the blood pressure, pulse rate and fetal heart rate are normal.
Facilitator:	Are you reassured by this?
Participant:	No, in pregnancy, compensation prevents the blood pressure from falling until 30% of blood volume has been lost.
Facilitator:	Would you like any more information from the woman?
Participant:	Yes, has she had any prior bleeding, however minor?
Facilitator:	She has had vaginal spotting following intercourse since the beginning of the 2nd trimester. Would you like any other information?
Participant:	Yes, has she had any ultrasound scans during this pregnancy and what is the location of the placenta? Any previous cervical smears?
Facilitator:	She has not had an ultrasound scan. She has lost a total of about 150ml of blood. How would you check that the bleeding has stopped?
Participant:	I would perform a speculum, not a vaginal examination.
Facilitator:	There is no active bleeding, but there is a probable large cervical ectropion on speculum examination. What are the likely cause of her bleeding? What are the differential diagnoses?

Participant:	Cervical ectropion. Placental abruption, placenta praevia, vasa praevia, other local causes e.g. female genital mutilation
Facilitator:	Our assessment is that she has a mild antepartum haemorrhage. Do we have a diagnosis?
Participant:	Bleeding, likely provoked from the cervical ectropion
Facilitator:	Is placenta praevia excluded?
Participant:	No, we can do an abdominal scan if available.
Facilitator:	There is no ultrasound scanner available at this healthcare facility. How do we manage her?
Participant:	Admit for observation for 24 hours. IV access. Take blood for Hb, full blood count, blood group and crossmatch. Regular clinical observations
Facilitator:	Can we keep her in the facility? Things appear to be under control. In which situations must this woman be referred?
Participant:	This woman would need to be referred if there is any further active bleeding. She must be transferred by ambulance with a relative, escort and equipment to a secondary level healthcare facility.
Facilitator:	There is an onsite ambulance and staff available to transfer the woman. What communication would you like to pass on to the healthcare facility if you did need to transfer this woman?
Participant:	A written summary of the scenario and estimated time of arrival.
Facilitator:	The woman arrives at the secondary level healthcare facility after one hour and care is taken over.

Discussion points

1. Challenges in the referral system
2. Identifying a suitable relative for blood donation

FACT BOX

- Antepartum bleeding is an obstetric emergency.
- Antepartum haemorrhage is bleeding from or into the genital tract, occurring from 24+0 weeks of pregnancy (age of viability) and prior to the birth of the baby.
- Healthcare providers can suspect concealed abruptions if PV bleeding of unknown cause
- The most important causes of antepartum haemorrhage are placenta praevia, placental abruption and vasa praevia.
- The most common cause is due to local genital tract bleeding e.g. from a cervical ectropion.
- Antepartum haemorrhage contributes to perinatal and maternal morbidity and mortality.
- Communication between different members of the healthcare team is vital.

8.3: Management of preterm labour and preterm premature rupture of membranes

Resources	
■ Thermometer	■ Syringes and blood specimen bottles
■ Sphygmomanometer	■ High vaginal swab
■ Fetal stethoscope or sonicaid	■ Sterile speculum

Key teaching points

This scenario covers the recognition and conservative management of preterm premature rupture of membranes followed by recognition and initial management of preterm labour, and the appropriate timing of delivery.

Key learning outcomes

- Define preterm premature rupture of membranes and preterm labour.
- Understand the principles of management of preterm premature rupture of membranes.

History

A 20-year-old primigravida attends for her routine antenatal appointment at 33 weeks. On questioning, she tells you that she has been leaking some fluid. She feels well otherwise and says the baby is moving.

Expected actions

Facilitator:	What other questions would you like to ask this woman?
Participant:	Introductions using respectful maternity care principles Take a history of the pregnancy to date, enquiring into her general health and the events around the onset of leakage, specifically: ■ Does she feel generally unwell – fever, foul smelling discharge, abdominal pain? ■ When did the symptoms start? ■ How long has leakage been occurring? ■ Check her HIV/Malaria/TB status ■ Is the baby moving? ■ Has she been treated with any medication? ■ Ask questions related to domestic violence.
Facilitator:	What could be the diagnosis and how is this defined?
Participant:	Preterm, prelabour rupture of membranes – defined as spontaneous rupture of membranes prior to 37 weeks' gestation and before the onset of labour.
Facilitator:	What could be the differential diagnosis?

Participant:	■ Urinary Incontinence ■ Normal vaginal discharge of pregnancy ■ Vaginal infection with watery discharge ■ Vaginal bleeding
Facilitator:	How would you examine the woman?
Participant:	Ensure privacy, consent and chaperone present. Explain the reasons for the performing assessment. ■ Measure the mother's pulse rate, respiratory rate, temperature, blood pressure to assess maternal wellbeing and assess clinical presentation of chorioamnionitis. ■ Abdominal palpation and fetal heart rate auscultation to confirm fetal viability. ■ Full blood count and c-reactive protein can be taken to monitor for infection or inflammation. ■ Midstream urine sample can be analysed. ■ Vaginal swab can be taken. Use a combination of clinical assessment and biomedical tests to diagnose intrauterine infection in women with preterm premature rupture of membranes. Continue to observe the woman and repeating full blood count and c-reactive protein tests and measurement of temperature.
Facilitator:	All clinical observations are normal and there are no signs of infection, the uterus is compatible with a 33-week pregnancy and the fetal heart rate is 142bpm. There is obvious leakage of liquor on a pad. Do all women required a sterile speculum?
Participant:	Digital examination and speculum examination must be avoided when a diagnosis of preterm premature rupture of membranes is suspected, unless the woman is possibly in labour, to reduce upward spread of infection and prostaglandin release which might stimulate labour. As amniotic fluid is seen on inspection or examination, take a high vaginal swab and offer appropriate care for preterm premature rupture of membranes. Only where a diagnosis cannot be made by any other means, can a careful sterile speculum examination be undertaken to detect the leakage of amniotic fluid through the cervix.
Facilitator:	What are the main risks for preterm premature rupture of membranes? What is the criteria for diagnosis of clinical chorioamnionitis?

Participant:	A combination of maternal pyrexia, tachycardia, leucocytosis and raised c-reactive protein uterine tenderness, offensive vaginal discharge and fetal tachycardia. Regular testing and re-examination is required. Maternal observations can be plotted on an observation chart.
Facilitator:	Can antenatal corticosteroids be administered and why?
Participant:	Antenatal corticosteroids can be administered in women with preterm premature rupture of membranes in any pregnancy where the foetus is viable (24 weeks or 28 weeks depending on setting).
Facilitator:	How would you manage this woman?
Participant:	■ Offer admission ■ Expectant management ■ Antibiotics ■ Corticosteroids to achieve lung maturity ■ Serial full blood count and c-reactive protein measurement ■ 30% of women will deliver within 48 hours and 60% within 7 days
Facilitator:	What role do antibiotics play in preterm premature rupture of membranes?
Participant:	■ Before viability, do not administer antibiotics unless there are clinical signs of infection. ■ After viability (depending on setting) give, 10 days' erythromycin 250mg four times a day for a maximum of ten days or until the woman is in established labour (whichever is sooner). ■ If erythromycin cannot be tolerated, give oral penicillin for a maximum of 10 days or until the woman is in established labour (whichever is sooner). ■ If the woman is known to be a carrier of Group B streptococcus prescribe antibiotics (benzylpenicillin) in preparation for labour. ■ Do not prescribe co-amoxiclav for prophylaxis due to an increased risk of necrotising enterocolitis.
Facilitator:	What is tocolysis and what is the role of tocolysis in preterm premature rupture of membranes?
Participant:	Tocolysis in women with preterm premature rupture of membranes is not recommended as treatment has not been shown to significantly improve perinatal outcome. Tocolytics can only be used in women with preterm premature rupture of membranes with uterine activity to enable administration of a full course of steroids or intrauterine transfer, if there is no concern regarding chorioamnionitis.

Facilitator:	What if a woman does not labour?
Participant:	Induction of labour can be arranged at the start of the 37th week (36+1 days), if the woman does not spontaneously labour.
Facilitator:	Is there are role for outpatient management of preterm premature rupture of membranes?
Participant:	This can be undertaken in some cases, women can receive disposable thermometers and record their temperature daily, with instructions to return if febrile. A care plan is agreed including: ■ Twice weekly maternal review and fetal monitoring ■ Twice weekly full blood count/c-reactive protein ■ Indications to return for medical review or induction of labour ■ Date of induction of labour

Discussion points

1. What is the age of viability in your setting?
2. How would you manage this woman if she was HIV positive?
3. Is there a role for repeated courses of maternal corticosteroids?

FACT BOX

Preterm prelabour rupture of membranes is defined as spontaneous rupture of membranes prior to 37 weeks' gestation and before the onset of regular uterine activity.

Very early preterm premature rupture of membranes is defined as preterm premature rupture of membranes between 16+0 and 25+6 weeks' gestational age.

- Birth can be expedited where there are clear signs of developing chorioamnionitis: maternal fever
- Uterine tenderness
- Meconium or infected liquor
- Abnormal fetal heart rate (e.g. persistent fetal tachycardia)
- C-reactive protein >70mg/dL or persistently above 40mg/dL
- Raised white blood cell count or evidence of a clear rise unrelated to antenatal corticosteroids

8.4: Management of fetal malpresentations

Resources	
■ Fetal stethoscope	■ Urine testing kit
■ Tape measure	■ Syringe for blood tests
■ Abdominal palpation model	

Key teaching points

One of the Facilitators (or participants) can play the role of the mother attending the antenatal clinic for only the second time during her pregnancy. She explains that she lives far away from the clinic.

The other Facilitator can give the history and discuss the management with the participants. As many participants, as possible can take part in the discussion and although the presentation in this scenario is breech, transverse and unstable lie can also be included in the discussion. The significance that her living far away from the clinic must be stressed.

Key learning outcomes

- Understand how to palpate the abdomen especially for lie and presentation.
- Manage malpresentation in the antenatal period.
- Explain the management of malpresentation to the woman.

History

The woman is a 22-year-old Para 1 presenting at the 36th week of her second pregnancy. She had attended booking clinic at the 22nd week and all investigations were normal. She received her first dose of antimalarial for IPTP and haematinics (ferrous sulphate) and was given an appointment to come again in 8 weeks. But, as she felt well and the clinic was far away, she did not attend.

Ask the participant to take a history from the woman.

Expected actions

Participant:	Introductions using respectful maternity care principles. The history must include general wellbeing and specifically: tiredness, shortness of breath, headaches, fever and vaginal bleeding.
Facilitator:	The woman insists she has been completely well with no symptoms or concerns. If she had been complaining of excessive tiredness and breathlessness what conditions can be considered?
Participant:	Anaemia as she had not taken haematinics regularly.

Facilitator:	Briefly discuss other causes of anaemia. Ask the participant to perform abdominal examination with commentary.
Participant:	Ensure privacy, consent and chaperone present The participant can mention external signs of pregnancy, height of fundus, liquor volume, the lie, presentation and position of the foetus and can listen to the fetal heart rate.
Facilitator:	The Facilitator explains that the presentation is breech and asks what the management will now be. The Facilitator can also discuss the use of ultrasound to confirm diagnosis if the healthcare provider is unsure.
Participant:	A decision can be made about mode of delivery taking into consideration the outcome of previous pregnancies and maternal wishes.
Facilitator:	The Facilitator tells the participant that the woman has had a previous normal vaginal delivery of 4kg baby and her history is uneventful. What else can be discussed?
Participant:	External cephalic version to convert the presentation to cephalic – external cephalic version can be performed any time from 36 weeks but requires referral to a secondary level healthcare facility. The woman can also be referred to a secondary level healthcare facility or delivery if the breech presentation persists.

Discussion points

1. The mechanics of external cephalic version, by whom and where this can be performed.
2. The practical difficulties associated with living far from a healthcare facility with no access to emergency Obstetric care.
3. It is important to diagnose malpresentations and to make appropriate decisions during the antenatal period. This includes detailed discussion with the woman and her family to explain the situation and persuade them to cooperate.
4. Counselling around the procedure of external cephalic version can be included including the rationale for performing, success rates, analgesics given, the procedure done and the possible complications (which are rare).
5. The other malpresentation sometimes found in the antenatal period is transverse lie which needs operative delivery.

Chapter 9: Fetal assessment and wellbeing

9.1: Fetal assessment during pregnancy

Resources	
■ Flip charts	■ Pens

Key teaching points

This scenario is a group discussion with the Facilitator guiding the direction of the discussion. The participants will understand that early diagnosis of abnormal fetal growth and movement and referral to the appropriate healthcare facility and healthcare provider is an important aspect of antenatal care. Encourage group discussion.

Key learning outcomes

- Understand the importance of fetal growth and fetal movements
- Understand abnormal fetal growth and movement and appropriate management to prevent stillbirth.

Instructions

- Group discussion of personal experience of the identification of abnormal fetal growth and the significance of detection and management
- Compare the care delivered at different healthcare facilities

Questions to guide the discussion

- What is the approach to fetal assessment in your setting?
- Are women counselled regarding the significance of fetal movement in pregnancy?
- Can you identify any gaps regarding fetal assessment in your local setting?
- When and how do you refer women if you identify abnormal fetal growth?
- Do you have criteria in your setting for performing ultrasound scans in pregnancy?
- Where and by whom are ultrasound scans performed in your local setting?
- What are the advantages/disadvantages of using ultrasound scans?
- Do you use growth charts or symphysis-fundal height charts in antenatal care?

Discussion points

1. How to improve monitoring of fetal surveillance.
2. Discuss country specific stillbirth rates and measures being taken to reduce these rates.

9.2: Screening for intra-uterine fetal growth restriction

Resources	
■ Pens	■ Tape measure
■ Flipcharts	■ Customised growth chart
■ Gestation calculator	

Key teaching points

A Facilitator will play the role of the pregnant woman attending for care and a participant will play the role of the healthcare provider (nurse/midwife) providing antenatal care, focusing specifically on measurement and management of fetal growth restriction.

Key learning outcomes

- Understand the importance of dating a pregnancy accurately.
- Understand the principles of measuring fetal growth and how to measure symphysis-fundal height.
- Understand the risk factors and how to diagnose and manage small-for-gestational-age and intrauterine growth restriction.

History

A 20-year-old pregnant woman presents at 36 weeks' gestation. She thinks her baby is smaller than that of her friend, who is also 36 weeks, she is anxious and concerned that the baby may not be growing properly.

Facilitator:	What is the first thing you can do?
Participant:	Introductions using respectful maternity care principles Review past obstetric and medical history at the booking visit. Check her HIV/Malaria/TB status. Note that fetal size varies with maternal height/weight, ethnicity.
Facilitator:	What are the ways to date a pregnancy and which is most reliable? Why is it so important?
Participant:	Use the gestation calculator (dating wheel). Last menstrual period, especially with reliable dates, using Nagle's rule. Dating scan – crown-rump length at 12-13 weeks is most accurate.
Facilitator:	How do you detect growth restriction?
Participant:	Accurate estimation of gestational age is essential. This ideally can be based on an ultrasound scan in the first trimester. Then, serial measurements of symphysis-fundal height can be plotted, preferably on a customised growth chart.

Facilitator:	How do you measure symphysis-fundal height? What is a customised growth chart?
Participant:	Symphysis-fundal height measurements can be obtained from 24 weeks onwards using a tape measure. The measurement can be taken in a consistent manner, usually starting from the highest point of the uterine fundus, down to the top of the symphysis, with the cm values hidden to prevent bias. Customised growth charts are produced individually and take account of maternal height, weight, parity and ethnic group. Where measurements are on a lower centile on the chart or if there is no growth in 3 weeks, referral is required for ultrasound assessment of fetal size.
Facilitator:	What are the risk factors for intrauterine growth restriction?
Participant:	The risk factors that can be identified during booking visit and the antenatal period are: ■ Previous small baby (less than 10th centile) ■ Previous stillbirth ■ Essential hypertension, pregnancy-induced hypertension or pre-eclampsia ■ Chronic renal disease ■ Antiphospholipid syndrome ■ Antepartum haemorrhage ■ Conception by Invitro fertilisation Infections e.g. HIV, TB and malaria If there are any risk factors or growth is static/tailing off, serial ultrasound measurements can be carried out and the growth plotted in comparison to earlier ultrasound measurements.
Facilitator:	What is the management of small-for-gestational-age? Intrauterine growth restriction?
Participant:	1. **Constitutionally small foetus**: Defined as estimated fetal weight <10th centile with normal liquor and umbilical artery doppler. These cases can be referred to specialist for further assessment where an individualised plan for follow-up and delivery will be made. 2. **Preterm intrauterine growth restriction**: All cases can be referred to a specialist. Management largely depends on gestational age, estimated fetal weight, overall fetal and maternal assessment. Cases must be individualized and, ideally, a Paediatrician can be involved in the decision-making process.

Discussion points

1. The importance of serial measurements of symphysis-fundal height to be recorded at each antenatal appointment from 28 weeks of pregnancy as this improves prediction of a small or large for gestational age neonates.
2. The importance of using a consistent standard method to measure symphysis-fundal height.
3. What experience do healthcare providers have of monitoring fetal growth in the local setting?
4. Is there access to ultrasound? Who conducts the ultrasound scan?
5. When possible, symphysis-fundal height can be plotted on a customised rather than a population-based chart as this may improve the prediction of small-for-gestational-age.

9.3: Indications for induction of labour

Resources
■ Obstetric calculating wheel

Key teaching points

One Facilitator can play the role of the pregnant woman, while the other gives the history to the participants and asks them to attend to the pregnant woman as they would in a real-life situation. The expected actions of the participants and the expected outcomes for the Facilitator to feedback are listed below. Encourage discussion and team work.

Key learning outcomes

- Understand why, when and how to induce labour.
- Understand the risks of and contraindications for induction of labour.

History

A woman in her first pregnancy comes to your healthcare facility and tells you that she is overdue, her estimated date of delivery by two weeks and there are no signs of labour. She says that her last menstrual period was in February. The pregnant woman attends the antenatal care on 26th November.

Expected actions

Facilitator:	What questions would you ask her?
Participant:	Introductions using respectful maternity care principles General health, antenatal care during pregnancy, medical and surgical history. Does she feel fetal movement?
Facilitator:	She has attended for antenatal care. She is feeling fetal movements, which have changed a little but the baby is still active. What more do we want to know from her?
Participant:	The exact date of her last menstrual period. How sure she is of this date? Were her periods regular before the last menstrual period? What contraception (if any) she was using before the last period?
Facilitator:	She says that that her labour is two weeks overdue, what is the most important evidence for this?
Participant:	Due date calculated by early ultrasound scan using crown-rump length.

Facilitator:	Where might you find documentation of this?
Participant:	In her handheld antenatal record or in a healthcare facility record.
Facilitator:	Her antenatal record documents four antenatal visits. On review, a scan on 30th May documents "16 weeks, single foetus". When is her expected date of delivery?
Participant	(With the aid of the calculating wheel) 14th November
Facilitator:	What is important to note in the abdominal examination?
Participant:	Size of the foetus, lie, presentation, engagement, presence of fetal heartbeat, estimate of liquor volume
Facilitator:	What is your advice to her?
Participant:	Refer to a healthcare facility with facilities for Caesarean section for consideration of induction of labour.
Facilitator:	What are the indications for induction of labour?
Participant:	■ Induction of labour can be performed only when there is a clear medical indication and the expected benefits outweigh the potential harms. ■ Induction of labour is recommended for women who are known with certainty to have reached 41 weeks (>40 weeks + 10 days) of gestation. ■ Induction of labour is not recommended in women with an uncomplicated pregnancy at gestational age of less than 41 weeks. ■ If gestational diabetes is the only abnormality, induction of labour before 41 weeks of gestation is not recommended. ■ Induction of labour at term is not recommended for suspected fetal macrosomia. ■ Induction of labour is recommended for women with prelabour rupture of membranes at term.

Facilitator:	What are the available methods of induction of labour and what is the evidence for this?
Participant:	■ If prostaglandins are not available, intravenous oxytocin alone can be used for the induction of labour. ■ Amniotomy alone is not recommended for the induction of labour. ■ Oral misoprostol (25µg, 2-hourly) is recommended for the induction of labour. ■ Low-dose vaginal misoprostol (25µg, 6-hourly) is recommended for the induction of labour. ■ Misoprostol is not recommended for the induction of labour in women with previous Caesarean section. ■ Low doses of vaginal prostaglandins are recommended for the induction of labour. ■ In the third trimester of a woman with a dead foetus, oral or vaginal misoprostol is recommended for the induction of labour. ■ Sweeping the membranes is recommended for reducing formal induction of labour.

Discussion points

1. Early scans before 12 weeks are the best method to establish the estimated delivery date. Late scans are not a reliable means of establishing dates.
2. If her periods were irregular prior to pregnancy, the date of last menstrual period is not a reliable guide when calculating the estimated delivery date.
3. In applying the recommendations, consideration must be given to the actual condition, wishes and preferences of each woman, with emphasis being placed on cervical status, the specific method of induction of labour and associated conditions such as parity and rupture of membranes.
4. Induction of labour must be performed with caution since the procedure carries the risk of uterine hyper stimulation and rupture and fetal distress.
5. The woman must attend a secondary level healthcare facility for induction of labour/delivery (due to the risks of induction or labour with post mature foetus).
6. 'Large baby' is not an indication for induction.
7. There are risks (e.g. uterine hyperstimulation, fetal distress, failure of induction) and possible contraindications (e.g. previous Caesarean section, breech).
8. Induction of labour for post maturity can be carried out between T + 10 and T + 14 for women with confirmed dates. The alternative is very close fetal surveillance.
9. The cervix (e.g. Bishop score) is a guide to how to induce rather than whether to induce, but, in borderline situations, it can influence the decision.

Established indications for induction of labour

- Preterm premature rupture of membranes beyond 37 weeks- choice of immediate or within 96 hours
- Diabetes in pregnancy – 38-39 weeks, depending on fetal growth and individual circumstances
- Prolonged pregnancy – >T+10-14 as determined by early pregnancy scan
- Other medical conditions (pre-eclampsia – depending on severity)

9.4: Management of multiple pregnancy

Resources	
■ Flip charts	■ Pens

Key teaching points

One Facilitator can play the pregnant woman, the other Facilitator can give the participants the history and ask the participants to treat the woman as they would in a real-life situation. The expected actions of the participants and their outcomes for the Facilitator to feedback are listed below. Encourage discussion and team work.

Key learning outcomes

- Understand how a multiple pregnancy is different from a singleton pregnancy, the additional risks in pregnancy, labour and delivery and how they may be anticipated and minimised by antenatal planning.
- Understand the problems faced by mothers of twins (and higher multiples) postnatally and how to help these mothers.

History

A 33-year-old woman in her 5th pregnancy comes to the antenatal care clinic at 28 weeks. She has no documentation but she says that she thinks that she is pregnant with twins because her abdomen is big and lumpy. She thinks there are two distinct sets of fetal movements and her aunt felt her abdomen and says she thinks it is twins.

Expected actions

Facilitator:	What do you ask her?
Participant:	Introductions using respectful maternity care principles Take a full systematic obstetric history regarding her previous pregnancies and deliveries. Has she attended antenatal care? Take a general history and ask about her present health.
Facilitator:	Are there any questions regarding her general health, in relation to a twin pregnancy?
Participant:	Ask about symptoms of anaemia.

Facilitator:	What do you look and feel for on examination of the abdomen?
Participant:	Ensure privacy, consent, chaperone present Fundus large for dates, more than two fetal poles, two separate fetal heart beats, lie and presentation of the twins. Symphysis-fundal height cannot be used to monitor growth in twins
Facilitator:	How is the diagnosis of twins confirmed?
Participant:	Ultrasound scan
Facilitator:	What other useful information will a scan provide?
Participant:	Type of twins, chronicity, nuchal thickness and estimated date of delivery can be determined in the first trimester by ultrasound scan. Lie and presentation, excludes higher multiples. Estimate fetal sizes and any growth discordance in the twins. It is more difficult to detect intrauterine growth restriction in twins, so serial ultrasounds are essential. Ideally, detailed anomaly and cardiac scans are needed for the twins.
Facilitator:	What investigations are important, particularly for a twin pregnancy?
Participant:	Haemoglobin Screen for pre-eclampsia Screen for gestational diabetes
Facilitator:	What discussions are required antenatally?
Participant:	Educate regarding danger signs for threatened premature labour and the need for antenatal corticosteroids if preterm labour is anticipated. Discuss the place and timing of delivery. She must deliver in a secondary level healthcare facility due to the high risks associated with delivery and the possibility of needing a Caesarean section in labour. The newborn may need neonatal support.
Facilitator:	Any immediate management suggestions?
Participant:	Oral iron and 5mg folate supplements

Facilitator:	What about postnatal care?
Participant:	She will need extra help in the home, possibly also with breastfeeding. She can be encouraged to report to the postnatal clinics and commence contraceptives.

Discussion points

1. Diagnosis of twin pregnancy, using ultrasound scans, Lamda and T signs on scans to determine chronicity. The scan will not establish the dates or the chronicity (too late for either).
2. The woman needs to be delivered at a secondary level healthcare facility due to the risks associated with delivery (possible need for Caesarean section).
3. Babies are at risk:
   - □ Antenatally from growth restriction, intrauterine death and rarer complications such as twin-to-twin transfusion.
   - □ Intrapartum from fetal hypoxia, especially the second twin at delivery.
   - □ In early infancy and throughout infancy and childhood from many causes, particularly nutrition-related causes in infancy.
4. The mother has higher iron and particularly folic acid needs than in a singleton pregnancy.

Chapter 10: Postnatal care

10.1: Models of postnatal care and referral

Resources	
■ Flip charts	■ Pens

Key teaching points

This is a group discussion during which the Facilitator can focus and guide the direction of the discussion. The Facilitator can encourage the entire group to participate. The participants must understand that early diagnosis of morbidity and referral to the appropriate healthcare facility and healthcare provider is extremely important in postnatal care.

Key learning outcomes

- Understand of country-specific postnatal models of care and maternal healthcare system.
- Understand the importance of appropriate postnatal referral to a suitable healthcare facility and healthcare provider.

Instructions

Group discussion of personal experience of delivery of postnatal care.
Compare care delivered at healthcare facility level and care in the community.

Discussion points

1. What is the approach to comprehensive postnatal care in your setting, including number and spacing and structure of postnatal visits?
2. Is the delivery of care for mother and baby combined?
3. Who is responsible for delivery of postnatal care?
4. When and how do you refer women if you identify a postnatal problem?
5. Who counsels on and provides contraception?
6. Do you have criteria for which women require follow-up visits at the healthcare facility in your setting?
7. Can you identify any gaps/or challenges in postnatal care in your local setting?
8. What solutions would you suggest?

10.2: Postnatal assessment of mother and baby

Resources	
■ Blood pressure machine	■ Equipment for birth examination
■ Thermometer and stethoscope	■ Postnatal care record
■ Blood taking equipment and blood forms	■ Paper and pens
■ Vaccinations	■ Flip charts and pens

Key teaching points

The postnatal period is a critical time and the woman must be closely monitored for symptoms and signs of life-threatening complications such as postpartum haemorrhage, especially during the first 24 hours after delivery. The newborn must also be closely monitored for danger signs following birth.

This initial assessment can be presented as a group discussion or role play. For a group discussion, use the flipchart to present the clinical assessment findings using a simple diagram (stick figure) for a head to toe examination for the mother and newborn.

For the role play, one of the Facilitators can play the woman. The other Facilitator can give the participants the history and then ask one of them to play the role of the healthcare provider and conduct a full postnatal assessment of the woman. Point out to the participants that there is equipment available on an adjacent table for them to use. The expected actions of the participant and the outcomes of the visit are outlined below. If the participants fail to undertake a full assessment of the woman as outlined below, the Facilitator can lead them gently through the progress.

Key learning outcomes

- Understand the principles of effective routine postpartum care for mothers and newborns.
- Understand how to carry out a full postnatal history and assessment, mother and newborn care for the early postnatal period – the first 24 hours after birth (including essential newborn care).
- Provide relevant information/education/counselling to mothers attending postnatal care.

History

You are caring for a woman (P5) who had a normal birth 6 hours ago in a healthcare facility. She gave birth to a healthy term newborn (3.6kg). Her placenta was complete, her perineum was intact, but after delivery she had an estimated blood loss of 800mls.

Expected actions

Facilitator:	Ask the participants to summarise the key points from the history What questions can you ask the woman?
Participant:	Introductions using respectful maternity care principles Greet the woman and introduce yourself and explain the reason for the postnatal check for her and her newborn after delivery. Ask how is she feeling after the birth, is she in any pain? Prepare the woman for the examination (not disrupting breastfeeding).

Facilitator:	What would you look for on examination? (use the flipchart to go through the steps)
Participant:	Ensure privacy, consent and chaperone present Before proceeding to the examination, ask for consent and wash your hands. Assessment of mother's condition, head-to-toe examination: □ Observations of vital signs: Check the pulse and blood pressure immediately after birth, then after one hour. Commence routine monitoring (6 hourly) if results are normal. □ Monitor clinical observations 6 hourly until discharge. □ Regular monitoring of lochia (more than 2-3 sanitary pads in 30 minutes is a danger sign) □ Involution of the uterus □ Signs of anaemia □ Check that the legs are soft and non-tender, assess for calf pain □ Ensure the woman has passed urine within the last 6 hours and regularly, assess for urinary incontinence, assess for fistula □ Perform abdominal examination – assess for bladder distension and urinary retention □ Monitor the progress of underlying disease conditions such as hypertension, diabetes, renal problems, sickle cell disease, etc. Review and update (if not complete) the postnatal records for: 1. Current pregnancy 2. History of any previous pregnancies 3. Birth 4. Past medical history Newborn □ Initiate breastfeeding within an hour after delivery □ Ensure the newborn is warm □ Encourage Kangaroo mother care □ Take temperature □ Take and record birth weight □ Conduct a head-to-toe examination □ Assess for danger signs □ Cord care □ Record in postnatal register and mother and child booklet
Facilitator:	What investigations can be undertaken?
Participant:	Check the woman's Hb

Facilitator:	How are you going to treat this woman and her newborn?
Participant:	**Woman – inform and advise** If there are no clinical signs of anaemia, continue with iron/folic acid supplementation for 3 months If the woman is anaemic, treat per local protocols. Provide facilities for the woman to wash herself after the delivery and explain perineum hygiene, regular changing of sanitary towels. Encourage mobility to prevent thrombosis. Provide appropriate analgesia as requested. Discuss maternal danger signs requiring immediate attention: □ Headache with visual disturbance, and/or seizures □ Difficult or rapid breathing □ Fever □ Substantial abdominal pain □ Foul-smelling vaginal discharge **Newborn (following components of essential newborn care)** Encourage early initiation of and exclusive breastfeeding Encourage skin-to-skin contact Ensure warmth and put hat on newborn Immunisation (Bacillus Calmette-Guérin, Polio, hep B), vitamin A (Vitamin K, if available) Tetracycline eye ointment 1% Treat or refer the newborn if any complications are detected
Facilitator:	Can the woman and be discharged from the healthcare facility?
Participant:	**Review mother and newborn before discharge** If there are no problems or complications (no fever, headache, offensive lochia, hyper/hypotension, physical wellbeing) in the mother and newborn (breastfeeding established, maintaining body temperature), they can be discharged within 12-24 hours following birth. The woman can be counselled on the danger signs for both herself and her newborn and to seek medical attention if danger signs are present. She can be advised on what is expected of her when she gets home to ensure that her newborn and she maintain good health. Discuss birth registration details.
Facilitator:	How are you going to advise and follow-up this woman and her newborn?

Participant:	**Mother** Advise the woman about personal hygiene, good nutrition, ferrous sulphate, long-lasting insecticide-treated bed nets and danger signs. The healthcare provider can advise women of signs and symptoms of possible serious conditions (sudden and increased blood loss, headaches, shortness of breath and chest pain. Give her contact details for the closest clinics/hospitals to her home. Advise the woman on her immediate contraceptive needs (if applicable). Advise on maternal mental health, what to expect/look for with newborn blues and/or postnatal depression. Document findings, plan of care and plan the date of next appointment in 2 days. **Newborn** Cord care Regular feeds and keeping the newborn warm Danger signs and who to contact for advice and assistance Promote parenting and emotional wellbeing Care can be planned to involve the woman and her family and updated at each postnatal visit.

Discussion points

1. Discuss with the group the usual postnatal care provided in their healthcare facility and how it can be improved.
2. Discuss the challenges with the discharge procedure and what can be included.
3. How do staff promote parenting and emotional attachment?
4. How do we screen for maternal mental health and how important is it?

FACT BOX

Dangers signs in the postnatal period

Danger signs in the mother	Danger signs in a newborn
■ Sudden and profuse blood loss or persistent, increased blood loss ■ Foul smelling vaginal discharge ■ Fever ■ Severe abdominal pain ■ Breathlessness, dizziness, excessive tiredness, palpitations or tachycardia ■ Swollen hands, face and legs with severe headache and blurred vision ■ Shortness of breath or chest pain ■ Widespread rash	■ Not able to breastfeed ■ Vomits after every feed ■ Lethargic or unconscious ■ Convulsion ■ Breathing at a rate of 60 breaths per minutes or more ■ Severe chest in-drawing or grunting ■ High temperature 37.5°C or more or low temperature 36°C or less ■ Low birth weight ■ Yellow soles (severe jaundice) needs urgent referral ■ Infection on the umbilicus

10.3: Care of the perineum

Resources	
■ Sterile gloves	■ Sterile non-gauze
■ Speculum (different sizes)	■ Sterile gauze/cotton

Key teaching points

One Facilitator can play the pregnant woman, the other Facilitator can give the participants the history and ask them to deal with the pregnant woman as they would in a real-life situation. The expected actions of the participants and their outcomes for the Facilitator to feedback are listed below. If the participants are failing to deliver the expected treatment, guide them gently through the process. Other participants can act as assistants. Encourage discussion and team work.

Key learning outcomes

- Define the classifications of perineal trauma.
- Understand the complications and management of perineal trauma.
- Describe the different types of urinary and faecal incontinence and management.

History

A woman at 37 weeks' gestation was labouring at home for several days. The labour was progressing slowly, so a traditional birth attendant referred the woman to the hospital, where a baby girl was born by assisted delivery (vacuum). An episiotomy was performed and was repaired. The delivery took place two days ago, but now she is complaining that some urine is leaking.

Expected actions

Facilitator:	What questions would you ask the woman?
Participant:	Greet the woman and introduce yourself and explain the reason for the examination. Ask how is she feeling? Is she in pain, pale or bleeding? Has she had a fever? Does she have any other complaints? Prepare the woman for the examination (not disrupting breastfeeding).
Facilitator:	What would you look for on examination?
Participant:	Ensure privacy, consent and chaperone present Assess, document and educate regarding the type of vaginal tear and explain all procedures to the mother and her support person.
Facilitator:	What do you think is happening? What are the differential diagnosis? How are you going to treat this woman?

Participant:	Offer pain relief. Check urinalysis and midstream urine samples of urine for a urinary tract infection. Perform the methyl blue dye test to rule out/diagnose a fistula. Perform a bladder scan if available to rule out urinary retention. Insert an indwelling Foley catheter post-delivery for at risk cases i.e. those who suffered obstructed labour but who are asymptomatic of fistula symptoms – catheter for 10-14 days or symptomatic fresh vesicovaginal fistula – indwelling Foley catheter for 4-6 weeks post-delivery. Offer prophylactic antibiotics.
Facilitator:	What health education/advice would you give?
Participant:	Personal hygiene, perineum hygiene, regular changing of sanitary towels. Advise the woman about resumption of sexual intercourse. If there are any concerns of vesicovaginal fistula, refer to a higher-level healthcare facility. Discuss, prevention of a subsequent obstetric fistula or any recovered case e.g. elective Caesarean section for all future pregnancies.
Facilitator:	The mother is asked to return in one week, when the healthcare provider examines her, the wound has broken down and she is complaining of faecal incontinence. What would you do?
Participant:	Refer to a higher-level healthcare facility for treatment.

Discussion points

1. Bladder care after vaginal delivery.
2. Different types of urinary incontinence and management.
3. Different types of faecal incontinence and management.

FACT BOX

Classification of perineal trauma:

- **First-degree tear**: Injury to perineal skin and/or vaginal mucosa.
- **Second-degree tear**: Injury to perineum involving perineal muscles but not involving the anal sphincter.
- **Third-degree tear**: Injury to perineum involving the anal sphincter complex:
  - Grade 3a tear: Less than 50% of external anal sphincter (EAS) thickness torn.
  - Grade 3b tear: More than 50% of EAS thickness torn.
  - Grade 3c tear: Both EAS and internal anal sphincter (IAS) torn.
- **Fourth-degree tear**: Injury to perineum involving the anal sphincter complex (EAS and IAS) and anorectal mucosa.

10.4: Care of the woman after Caesarean section

Resources	
■ Fluid balance chart	■ Stethoscope
■ Syringes	■ Blood pressure machine
■ Blood bottles	■ Cannula

Key teaching points

This station is about the systematic approach caring for a woman post-operatively following an emergency Caesarean section. One of the Facilitators can play the woman. The other Facilitator can give the participants the history, ask them to repeat back the details and then ask them to deal with the woman as they would in a real-life situation. The expected actions of the participants and their outcomes for the Facilitator to feedback are listed below. If the participants are failing to deliver the expected treatment, guide them gently though the process. Encourage discussion and team work.

Key learning outcomes

- Understand that the outcome of surgery is dependent on the quality of pre-and post-operative care.
- Establish a consistent, logical, sequential system of post-operative care.
- Improve the participant's ability to perform post-operative postnatal care.

History

You have taken over the care of a 26-year-old woman who had a Caesarean section due to obstructed labour. She gave birth to a live female infant 12 hours ago.

Expected actions

Facilitator:	How would you care for this woman?
Participant:	Respectful maternity care principles Routine post-operative care, clinical observations, care of mother and newborn.
Facilitator:	Summarise the participant's response placing emphasis on preparation by information gathering and regular observations in the immediate postnatal period. Ask what information you want to review before providing care for this woman and why?
Participant:	Operation notes – to check for any post-operative complications and any specific post-operative instructions from the operating surgeons.
Facilitator:	The operation notes indicate the operation was complicated by bleeding due to atony. Estimated blood loss of 1200mls. What else would you want to review or know?

Participant:	The woman's clinical observations since the operation. Medications given during the procedure.
Facilitator:	The observation chart shows that she has had a persistent tachycardia of above 100bpm since the operation. All other parameters are normal. You are now ready to examine her. How do you approach this?
Participant:	First, introduce yourself and ask if she has any concerns.
Facilitator:	She felt dizzy when attempting to walk or move. Any other questions?
Participant:	Any fainting episodes? Others – feeding, pain control, opening bowels and passing urine, any calf tenderness?
Facilitator:	She has had a full breakfast and is tolerating it. Pain control is good. She is passing flatus but not stool. How would you examine her?
Participant:	Ensure privacy, consent and chaperone present A general examination then a head-to-toe examination. In the general examination, assess the general state of the woman (pain/respiratory distress), pallor, jaundice. Head-to-toe examination Central nervous system; ear, nose, throat; chest (especially if she was given general anaesthesia); abdomen; surgical site; uterine fundus Pad check for lochia flow and smell, legs for calf tenderness. Examination of the catheter to ensure good urine output.
Facilitator:	She is very pale, head-to-toe examination findings are normal. What would you like to do next?
Participant:	Full blood count for a Hb check, advise removal of the catheter and encourage movement.
Facilitator:	The full blood count reveals a Hb of 8.5g/dl, her temperature is now 37.7°C. What is the diagnosis and how do you manage?
Participant:	Anaemia Ensure the wound is clean. Closely monitor for signs of sepsis. Ensure the woman is taking antibiotics as per national protocol. Management options – transfusion, IV iron or oral iron.
Facilitator:	Discuss indications for transfusion only if symptomatic.

Discussion points

1. Be aware of routine post-operative review and importance of immediate post-operative care.
2. Be aware of possible post-operative complications and approaches to management.
3. Recovery from Caesarean section is quite often straightforward and uneventful. However, on some occasions, it is complicated with issues arising during the operation itself or arising during the postpartum period.
4. It is essential to identify such problems early to reduce maternal morbidity and mortality.
5. Important complications include: infections, venous thromboembolism, anaemia, postpartum bleeding and complications arising from surgery such as organ injury.

10.5: Recognition of the sick mother

Resources	
■ Pulse-oximeter	■ Stethoscope
■ Blood pressure machine	■ Thermometer

Key teaching points

This scenario covers the recognition and initial management of the sick mother after delivery. One of the Facilitators can play the woman. The other Facilitator can give participants the history, ask them to repeat back the details and then ask them to deal with the woman as they would in a real-life situation. Point out to the participants that there is equipment available on an adjacent table for them to use. The expected actions of the participants and their outcomes for the Facilitator to feedback are listed below. If the participants are failing to deliver the expected treatment, guide them gently though the process. Encourage discussion and team work.

Key learning outcomes

- Conduct and interpret abnormal basic observations using an observation chart.
- Recognise the sick mother.
- Understand the differential diagnosis and principles of management of the unwell mother after delivery.

History

A 24-year-old woman delivered her first newborn at home, but presented to the health centre as her placenta was retained. Her placenta was removed yesterday and she is keen for discharge. You attend the woman to conduct her postnatal check.

Expected actions

Facilitator:	What other questions would you like to ask this woman?
Participant:	Introductions using respectful maternity care principles Conduct a full systematic obstetric and medical history: ■ Lochia, colour, amount, increasing or decreasing? ■ Does she feel generally unwell? ■ How long has she experienced the symptoms for? ■ Any associated symptoms? ■ Check details of the delivery ■ Maternal wellbeing – fever, foul smelling discharge, abdominal pain ■ Check her HIV/Malaria/TB status ■ How is her baby? ■ What is the duration of her various symptoms? ■ Has she been treated with any medication? ■ Check she has been screened for depression/domestic violence.
Facilitator:	How would you quickly assess this woman?

Participant:	Ensure privacy, consent, chaperone Parameters to be measured/assessed by the healthcare provider ■ Respiratory rate ■ Pulse rate ■ Blood pressure ■ Temperature ■ Conscious level (AVPU) ■ Oxygen saturation Oxygen saturation levels do not need to be routinely taken unless indicated.
Facilitator:	On examination, her pulse rate is 110bpm, respiratory rate is 24, blood pressure is 100/60mmHg and her temperature is 37.4°C. She feels tired but otherwise fine. What could be the likely diagnosis and how is this defined?
Participant:	Anaemia and postpartum haemorrhage due to retained placenta.
Facilitator:	What could be the differential diagnosis and how would you assess?
Participant:	Infection – endometritis, urinary tract infection Physiological Dehydration
Facilitator:	What are the risk factors for anaemia?
Participant:	Pre-existing anaemia prior to pregnancy Not taking medication for anaemia Postpartum haemorrhage Malaria
Facilitator:	What investigations would you perform?
Participant:	Vital signs can be recorded and observed for clinical signs of severe anaemia. Full blood count and c-reactive protein can be taken to rule out infection or inflammation. Dipstick (multistix) for urine will give a more rapid initial result if the urine contains nitrites and/or leucocytes. A midstream urine sample can be assessed for signs of urinary tract infection. High vaginal swab can be taken (not necessarily with a speculum). If the results of clinical assessment or any biomedical tests are not consistent with each other, continue to observe the woman and consider repeating the tests.

<table>
<tr><td>Facilitator:</td><td>The Facilitator confirms there are no signs of infection, her Hb level is 7.4g/dl on HemoCue®.</td></tr>
<tr><td>Facilitator:</td><td>How would you manage this woman?</td></tr>
<tr><td>Participant:</td><td>■ Medical management of anaemia with iron supplementation.
■ Dietary advice.
■ Prescribe antibiotics for prevention of infection due to manual removal of the placenta.</td></tr>
<tr><td>Facilitator:</td><td>How often can basic observations be conducted?</td></tr>
<tr><td>Participant:</td><td>Every woman must have at least two sets of observations performed per day including: temperature, pulse rate, respiratory rate, central nervous system, oxygen saturation rate, urine output must be scored (including if urinary catheter present).

<table>
<tr><th colspan="2">Frequency of Observations</th></tr>
<tr><td>Caesarean section</td><td>½ hourly for 4 hours
Hourly for 6 hours
6 hourly for 48 hours (use clinical judgement 24 hours during sleep)
Daily until discharge</td></tr>
<tr><td>Other procedures under anaesthesia</td><td>½ hourly for 4 hours
Hourly for 6 hours
4 hourly for 24 hours</td></tr>
<tr><td>Postpartum haemorrhage</td><td>½ hourly for 4 hours
4 hourly for 24 hours</td></tr>
<tr><td>Diastolic of 90 or over</td><td>Minimum 4 hourly until discharge or start of labour</td></tr>
<tr><td>Identified antenatally (diabetes, ruptured membranes, known or suspected infection)</td><td>4 hourly (unless indicated otherwise) until discharge</td></tr>
<tr><td>Postnatal women with suspected or confirmed infection</td><td>4 hourly for a minimum of 24 hours
Once daily until discharged</td></tr>
</table></td></tr>
<tr><td>Facilitator:</td><td>What are the normal ranges for clinical observations?</td></tr>
<tr><td>Participant:</td><td>
<table>
<tr><td>Blood pressure – systolic</td><td>100-150mmHg</td></tr>
<tr><td>Blood pressure – diastolic</td><td>50-80mmHg</td></tr>
<tr><td>Respiratory rate</td><td>12-20 breaths per minute</td></tr>
<tr><td>Oxygen saturation</td><td>96-100%</td></tr>
<tr><td>Pulse</td><td>51-90 beats per minute</td></tr>
<tr><td>Temperature</td><td>36-37.5°C</td></tr>
<tr><td>Neurological</td><td>Alert, orientated to time, person, place</td></tr>
</table></td></tr>
</table>

Facilitator:	What action would you take if any of the clinical observations were in the abnormal range?
Participant:	Increase the frequency of the observations and inform a senior healthcare provider immediately and ask them to review.

Discussion points

1. What are the postnatal complications seen frequently in your setting?
2. What facilities are available to treat retained placenta in your setting?
3. What treatment options are available?

FACT BOX

Early detection and treatment of deteriorating physiology responds more rapidly and effectively than advanced altered physiology.

The scope of this scenario is to ensure that all healthcare providers involved in maternity care can recognise abnormal clinical observations, assess the woman and refer sick mothers to the appropriate healthcare provider immediately.

Respiratory Rate (RR) is measured by observing the woman's number of completed breaths over 60 seconds.
Pulse rate (PR) is measured manually or electronically over 60 seconds.
Blood Pressure (BP) can be measured using an automated measurement system where available, if there are variations from normal parameters this can be verified by manual measurement.
Temperature (T) can be taken orally.
Conscious Level (AVPU) Assessment of woman's mental alertness: Alert, Voice, Pain, Unconscious.
Urine Output is ml per hour. Fluid balance charts must be used to record 4 hourly output unless other medical plan clearly documented in notes.
Oxygen Saturation can be measured using a pulse-oximeter (if available).

10.6: Breastfeeding and breast examination

Resources	
■ Mama Breast model	■ Demonstration breast with a lump in it
■ Breastfeeding positional doll	

Key learning outcomes

- Practice examination of the breast and breast care.
- Demonstrate breastfeeding positions and identify problem areas.

Instructions

Demonstrate the examination and then allow the participants to practise on the models provided, under supervision.

Breast examination

- Inspect: size, symmetry, shape of breast and nipples
- Palpate: fullness, soft or engorged, firmness and lumps
- Redness, bruising, open wounds, presence of mastitis and colostrum

To demonstrate and explain positioning for the mother and newborn for breastfeeding, have dolls and pillows available to demonstrate proper positioning of the infant. Give small groups a breastfeeding challenge (e.g. sore nipples, engorgement) and give feedback on what they advise.

Procedure	Instructions
Sitting in a chair	■ Place the newborn lying across your lap, with her head supported on your forearm, her nose towards your nipple. ■ Make sure the ear, shoulder and hip are in a line, not twisted round. ■ Across your lap, with your opposite hand and wrist supporting her upper back and neck.
Underarm	■ By placing cushions at your side, the newborn can rest on them, with legs pointing behind you. ■ The newborn will be tucked under your arm for support. ■ You can support the newborn behind the shoulders and neck with your right hand when the newborn is at your right breast and vice versa, or support with pillows. ■ Starting nose-to-nipple helps the newborn attach well. ■ This position can work well for twins as each baby has their own space.
Lying down	■ Lying on your side, rest your head on a pillow, your baby can tuck in close to your body. You can guide the baby to your breast and support her with your free hand. ■ A pillow behind you will support your back. ■ If you have had a Caesarean section or need to stay in bed, breastfeeding lying down can be very relaxing and help you get more rest.

Whatever position, remember:

- Bring the newborn to the breast or let the newborn attach rather than leaning towards the newborn.
- Check that the newborn's ear, shoulder and hip are in a straight line.
- Using cushions and other supports may help.

Assess breastfeeding attachment

Correct	Incorrect
Newborn tucked in as close to you as possible, chin against your breast, wide open mouth, nose not pressed into your breast and deep jaw movements.	Cheeks sucked in, lips looking like sucking on a straw, squashed nipple at the end of the feed when your newborn comes off.
Soft sounds of milk being swallowed	Clicking noises, lip smacking
The let-down reflex – a tingling, 'drawing' feeling in your breasts	Pain while your newborn is feeding or persisting after the feed
A fleeting pain may be present at the start of the feed in the first few days or weeks.	If you see, hear or feel anything that doesn't seem right, you can gently insert your little finger into your newborn's mouth to break the suction and let the newborn come off, then let her start again.

Teaching hand expressing: explain the technique accurately, using simple language in a logical sequence using a hands-off approach.

1	Wash hands before starting.
2	Use a clean sterilised container to collect expressed breastmilk.
3	Stimulate the oxytocin reflex and prolactin release by encouraging the woman to be comfortable and relaxed, encourage skin-to-skin contact with her baby, gently massage the breasts using kneading, circular or stroking movements and use warm cloths.
4	Cup the breast using the thumb and index finger in a C shape in line with the nipple.
5	Maintain the C shape and push back into the chest wall then compress the nipple with the index finger and thumb. Relax and repeat, developing a rhythm and stimulating a normal pattern of the baby feeding at the breast.
6	Avoid damaging the skin or pinching the nipple. At first, only a few drops may appear but with practice milk will flow freely.
7	Once the flow has subsided, rotate finger and thumb around this area of the breast and repeat.
8	Move to the other breast when rotation fails to bring renewed flow, repeating the cycle again if required. If milk doesn't flow, try more gentle massage then move finger and thumb nearer to or further away from the nipple.

Discussion points

1. Group discussion of breastfeeding tips and challenges to exclusive breastfeeding.
2. Advice to give to a woman with established lactation who needs to stop breastfeeding:
   - □ As the woman, has established lactation, suggest that she reduces the frequency and duration of expressing so that her breasts do not become overly engorged. Aim to discontinue expressing within 2-3 days.
   - □ Considerable practical and psychological support will be required.
   - □ Encourage the woman to wear a firm, supportive bra.
   - □ Encourage the woman to take adequate analgesia.
   - □ Ensure the woman is de-briefed following birth and knows who to contact if she needs psychological support.
   - □ This may be medically indicated if a woman has suffered a stillbirth or neonatal death.

10.7: Counselling and insertion of an intrauterine device

Resources	
■ Mama-U Postpartum Uterus Trainer	■ Sterile drapes
■ Intrauterine device set	■ Sterile gloves
■ Speculums	■ Cleaning agent

Key teaching points

The Facilitator can first explain the counselling skills and show the steps for insertion of the intrauterine device. Ensure that all participants can practice this skill.

Key learning outcomes

- Demonstrate procedures for postpartum intrauterine device insertion.
- Demonstrate the appropriate interaction with the woman during the clinical procedure.
- Demonstrate the use of correct infection prevention techniques before, during, and after postpartum intrauterine device insertion.

Instructions

Insertion steps for post placental insertion

Attention:

- Do not routinely perform a manual examination of the uterus before postpartum intrauterine device insertion.
- Provide analgesia as required.
- Do not use prophylactic antibiotics for postpartum intrauterine device insertion, as they are not needed.

- Prior to delivery, ensure the woman has given informed consent.
- Intrauterine devices and the instruments and supplies needed for insertion must be available in the delivery room, including surgical drapes to prepare the sterile field.
- Re-confirm the consent after delivery, and ensure there are no contraindications.
- Before the procedure: wash your hands thoroughly between women before putting on gloves.
- Talk to the woman throughout the procedure.
- Follow all infection prevention practises – Use only instruments, gloves, and drapes that have been sterilized.
- Use a gentle technique.
- The genital area needs to be examined and, if an episiotomy was performed or if there are vaginal lacerations or the cervix has tears and lacerations, these must be repaired after the intrauterine device insertion.
- Clean the procedure area and prepare sterile field.
- Palpate the uterus to evaluate the height of the fundus.
- Cleanse the external genitalia and vagina.
- Change into new sterile gloves.
- Insert the speculum to visualize the cervix.
- Clean cervix and vagina area twice with antiseptic solutions.
- Grasp anterior lip of cervix with ring forceps.

- Hold intrauterine device with placenta forceps inside its packing.
- Insert that forceps with the intrauterine device through the cervix into the lower uterine cavity (avoid touching the vagina).
- Place hand on suprapubic area, fingers towards the fundus. Gently push the uterus upwards towards to straighten the uterine cavity.
- Move the placental forceps with the intrauterine device upwards following the contour of the uterine cavity until the fundus is reached.
- Open and slightly tilt the forceps inwards to release the intrauterine device at fundus level.
- Keep uterus stabilised, slowly sweep the forceps along the side wall of the uterus.
- Keeping the uterus stabilised, withdraw the forceps slowly keeping it slightly open.
- Ensure the intrauterine device threads are not visible at the cervical OS.
- After the procedure while still wearing your gloves, dispose of contaminated wastes.
- Follow infection prevention steps to process the instruments.
- Allow the woman to rest and complete postpartum care.
- Complete records and provide post-insertion and follow-up instructions.

Discussion points

1. Discuss possible complications associated with the procedure.
2. Discuss the instructions to be given to the woman after the procedure.
   - □ Postpartum intrauterine device insertion is a safe and effective contraceptive option that is highly convenient for women seeking non-hormonal protection immediately following delivery.
   - □ Postpartum intrauterine device insertion or the insertion of an intrauterine device within 48 hours following childbirth can help address the unmet need for family planning in the postpartum period.
   - □ Post placental intrauterine device insertion can be performed in the delivery room immediately following the delivery or in the surgical ward during a Caesarean section; insertions in the immediate postpartum period can take place in a postpartum intrauterine device procedure room.

10.8: Management of HIV, TB and Malaria

Resources	
■ Pulse-oximeter	■ Thermometer
■ Blood pressure machine	■ Syringes and blood specimen bottles
■ Stethoscope	■ Testing equipment for HIV/Malaria/TB

Key teaching points

Medical conditions that existed prior to or occurred during pregnancy can be identified and the mother linked to the necessary postnatal follow-up visits to ensure the effective and timely management of her medical condition. Some medical conditions require a review of medications after delivery to ensure that they are safe for the newborn while breastfeeding and that the medical condition is being treated.

One of the Facilitators can play the woman. The other Facilitator can give the participants the history and then ask one of them to play the role of the healthcare provider and conduct a full postnatal assessment of the woman. Point out to the participants that there is equipment available on an adjacent table for them to use. The expected actions of the participant and the outcomes of the visit are outlined below. If the participants fail to undertake a full assessment of the woman as outlined below the Facilitator can lead them gently through the progress.

Key learning outcomes

- Understand the clinical presentation, diagnosis and complications experienced by pregnant women with HIV, Malaria and TB.
- Understand the diagnostic and management process.

History

A 24-year-old woman who had a baby 6 weeks ago, presents at the healthcare facility and reports feeling unwell and fatigued. She had antenatal care during her pregnancy and delivered her baby at a healthcare facility. She presents with a headache, fever and chills. She recently travelled to another part of the country for the funeral of her partner who died of TB and HIV. She stayed at her mother-in-law's house which is close to a lake and had no bed nets.

Expected actions

Facilitator:	What are the key issues from the history?
Participant:	First baby, identify, grief, possible medical problems of HIV, TB, malaria, anaemia.
Facilitator:	What would you do next?
Participant:	Introductions using respectful maternity care principles Offer condolences, offer to move her to a clinical examination room for further assessment.

Facilitator:	Would you want further information?
Participant:	Yes, conduct a full postnatal assessment: ■ Duration of symptoms ■ Associated symptoms – vomiting, diarrhoea, neck stiffness, urinary tract infection symptoms ■ Any weight loss or night sweats? ■ HIV status, if positive is she on treatment? ■ Husband's TB site – if pulmonary explore issues of contact and exposure. ■ Any other medications?
Facilitator:	She has no other symptoms. She is HIV positive and on antiretroviral treatment and her latest viral load was undetectable. She is compliant to medication and attends her clinic visits. Her husband had pulmonary TB. She has lost weight and has had night sweats which she attributes to the hot weather and pregnancy. She has taken some paracetamol with partial relief. What can be done next?
Participant:	General examination and systemic exam Ensure privacy, consent and chaperone present Look for pallor, jaundice, lymphadenopathy and assess vital signs – blood pressure, temperature, pulse rate, respiratory rate. Conduct a physical head-to-toe systematic examination. Weigh and calculate body mass index.
Facilitator:	She is pale, no jaundice, has swollen neck glands. Her vital signs – temperature 38.2°, respiratory rate 22, blood pressure 98/65mmHg, pulse rate 92. No significant findings on examination. What do you do next?
Participant:	Investigations – What investigations can be undertaken? Full blood count (or Hb if a full blood count is not possible), rapid diagnostic test for Malaria, thick film, midstream urine sample, HIV viral load and CD4 and syphilis tests, blood sugar, group and save. TB testing, liver function tests
Facilitator:	The full blood count shows Hb 9g/ml and positive malaria rapid diagnostic test. TB test is positive. How would you manage this woman?

Participant:	Admit or refer to higher hospital. Commence iron therapy, anti-malarial medication as per local protocol. TB treatment and order a chest x-ray.
Facilitator:	What care plan would you put in place for a baby of a mother who has TB, HIV and malaria?
Participant:	Explore feeding options, prophylaxis for HIV and TB. Sleeping under a bed net, strategies for early infant diagnosis of HIV (modalities and timing)

Discussion points

1. How does TB affect the mother and the baby?
2. How does HIV affect the mother and baby? Are there any ways of preventing the effects listed above? What are the implications for breastfeeding and mode of delivery?
3. Discuss prevention of mother-to-child transmission strategies.

10.9: Mental health in the postpartum period

Resources	
■ Flip charts	■ Pens

Key teaching points

Mothers with mental health problems require a well-coordinated approach to care, ideally with healthcare providers and specialists working together as part of a multidisciplinary team to provide prompt, holistic, women and family-centred care.

Healthcare providers are in a pivotal position with direct contact with mothers during and after pregnancy to facilitate early recognition of the signs and symptoms of developing mental illness and prompt referral to the most appropriate healthcare providers, if available. Communication between healthcare providers is essential if the changing needs of the woman and her family are to be met.

Key teaching outcomes

- Understand the interlinked approach to health: physical, psychological and social aspects.
- Understand the principles of assessment, diagnosis, management of psychosocial issues after childbirth.
- Appreciate when and how to make a referral to a higher cadre of healthcare provider for support for psychosocial issues (if available).

History

A 23-year-old mother, recently delivered at home (one week ago), she attends for a postnatal appointment and you notice she has had no care since her booking appointment. She looks thin, withdrawn and will not make eye contact with you. You ask her how the pregnancy and delivery was and she tells you that she struggled with anxiety throughout the pregnancy and was ashamed to seek help which is why she did not deliver at the hospital. She is not sleeping and is not feeling well in herself.

Expected actions

Facilitator:	What do you think is happening? How is mental health screened for routinely in your setting? How can the healthcare provider screen for mental health issues?

Participant:	Introductions using respectful maternity care principles Review the woman's past obstetric and medical history. Ask if woman has been diagnosed with any mental health issues or substance use/abuse Potential screening questions Whooley Questionnaire (Appendix 4) At a woman's first visit at her booking visit and postnatally, healthcare providers can ask two questions to identify possible depression. 1. During the past month, have you often been bothered by feeling down, depressed or hopeless? 2. During the past month, have you often been bothered by having little interest or pleasure in doing things? A third question can be considered if the woman answers 'yes' to both initial questions. 3. Is this something you feel you need or want help with?
Facilitator:	How can women be screened for mental health illness?
Participant:	All women can be asked at booking if they have or had in the past mental health illnesses as follows: ■ Schizophrenia ■ Bipolar disorder (manic depression) ■ Puerperal psychosis ■ Severe postnatal depression requiring hospital admission ■ Psychiatric admission (sectioned under mental health act or voluntary) ■ Present care from community mental health team (Psychiatrist) ■ Self-harm (suicide attempt) with intent to kill themselves recently or in past pregnancy ■ Family history of serious mental health problems after childbirth ■ Post-traumatic stress disorder.

Facilitator:	What other features can be discussed with the woman if mental health illness has been identified or is pre-existing?
Participant:	■ Role and support of partner/family members ■ Care of existing children ■ Woman's social care environment ■ Woman's belief system – religion/culture ■ Take history of support and treatment from specialist mental healthcare providers (if available) ■ Is there a history of domestic violence?
Facilitator:	If you identify a woman with a mental health illness, what would you do?
Participant:	If the healthcare provider or mother has significant concerns, the mother can normally be referred for further assessment to a higher level, either directly or via an Obstetrician, depending on referral pathway. ■ Follow-up with further information and to provide appropriate support/treatment. ■ Explain the 30-50% risk of a significant postnatal mental health problem. ■ Record this in her notes and inform the woman of risk factors. ■ Discuss the frequency of postnatal appointments and ensure she sees a specialist team. ■ Try and ensure that she is seen by the same healthcare provider when she attends for postnatal care.
Facilitator:	What specific birth plan would be make for a woman with a mental health illness?
Participant:	Develop an integrated care plan: ■ Developed in collaboration with the woman and her partner, family and carers, and relevant healthcare professionals. ■ Include increased contact with specialist mental healthcare providers (if available) ■ The plan can be recorded in all versions of the woman's notes (her own records and maternity, primary care and mental health notes) and communicated to the woman and all relevant healthcare providers.

Facilitator:	What arrangements can be made for postnatal care?
Participant:	■ If there is a risk of harm to mother and newborn identified by the midwife, women cannot be left on their own if mental health deteriorates. ■ Admission to hospital determined by the postnatal risk assessment. ■ Consider the length of inpatient stay. If no concerns emerge, she can go home. Women at a higher risk of experiencing exacerbation of mental health problems can be allowed to stay on the ward up to 5 days' post birth. ■ Specialist healthcare provider to visit the woman on the ward, if available. ■ Medication to be observed and managed as per psychiatric plan of care. ■ All at risk women to be observed for exacerbation of mental health problems. ■ Before discharge, all women who have suffered with a significant mental health condition/illness either following childbirth or at any other time must be informed about the possible recurrence of that illness after future childbirth.
Facilitator:	How can the healthcare provider help woman with a mental health illness after childbirth?
Participant:	Ideally, women with an existing, known mental health problem can have preconception counselling to discuss: 1. How mental health problems can affect parenting. 2. Discuss medications during pregnancy and breastfeeding. 3. If she is taking anti-manic, psychotropic and anti-epileptic medications, refer to perinatal mental health team. 4. Use of contraception and plans of future pregnancies.

Discussion points

1. How is mental illness viewed in your setting at family, health facility and community levels?
2. What specific care is available for women who report mental health issue?

10.10: Counselling after a serious adverse incident

■ Flip charts	■ Pens

Key teaching points

This station is about how to provide care to women who have suffered a serious adverse incident. It will demonstrate how healthcare providers can provide care that is respectful and women-friendly. For the role play scenario, a Facilitator will act the role of the pregnant woman attending for care and a participant play the role of the healthcare provider (nurse/midwife) taking the antenatal history. The setting is large postnatal ward and the woman has many relatives in attendance. The other participants in the group are observing but are encouraged to make comments.

Key learning outcomes

- Understand what an adverse event is and how common these events are.
- Understand the effect an adverse event can have on a mother, her family and the wider community.
- Understand the principles of how to counsel, debrief and educate women who have suffered an adverse incident during or after pregnancy and childbirth.
- Understand the supportive role of a healthcare provider.
- Understand that health and wellbeing are not just physical components.

History

A 24-year-old primigravid woman who is 39 weeks' pregnant presents at your healthcare facility in obstructed labour. Unfortunately, when the midwife listened for the fetal heart rate, she was unable to hear a heartbeat. The death of the foetus is then confirmed by ultrasound scan. The woman delivered a fresh stillbirth vaginally. Unfortunately, the baby was very large, the delivery was complicated with shoulder dystocia and the woman sustained a third-degree tear followed by a postpartum haemorrhage of 1.5 litres. The woman would like to be discharged.

Expected actions

Facilitator:	How would you approach this woman?
Participant:	Respectful care, empathy, sympathy, communication. Gentle considered care. Be prepared – read the medical records or speak to staff involved in the delivery. Allow the woman time to talk and formulate questions. Consider the woman and her partner's emotional state.

Facilitator:	What would you like to say to this woman?
Participant:	■ Debrief regarding the diagnosis of the stillbirth and the complications of the delivery. ■ Offer your condolences. ■ Say something simple like 'I am very sorry for your loss'. ■ Offer a simple account in simple terms of what happened and why. ■ Discuss if the woman would like photographs, name the baby, death certificate, post mortem? ■ Discuss remains of the baby and funeral arrangements.
Facilitator:	What other things would you like to check with the woman?
Participant:	■ Ensure adequate pain relief. ■ Ensure Hb is stable. ■ Ensure she is prescribed and obtained iron, antibiotics and laxatives. ■ Discuss the options and how to make use of any support services.
Facilitator:	What other types of incidents during and after pregnancy would prompt a specific debrief for the woman and her partner and a need reviewed within the healthcare facility at governance level?
Participant:	Mention some of the issues in the table below.

Maternal incident	**Fetal or neonatal incident**	**Organisational incidents**
Maternal death Shoulder dystocia Blood loss >1500ml Return to theatre Maternal seizure: eclampsia Hysterectomy/laparotomy Anaesthetic complications Intensive care admission Venous thromboembolism Pulmonary embolism Third-/fourth-degree tears Unsuccessful forceps or venous Uterine rupture Readmission of mother	Stillbirth >500g Neonatal death Apgar score <7 at 5 minutes Birth trauma Fetal laceration during Caesarean section Low Apgar scores Need for neonatal resuscitation Neonatal seizure Term baby admitted to neonatal unit Undiagnosed fetal anomaly	Unavailability of health record Delay in responding to call for assistance Lack of referral Faulty equipment Conflict over case management Medication error

Discussion points

1. Differences in how cultural norms can influence how a woman responds to an adverse event.
2. Each woman's experience and reaction is subjective and individual.
3. Health components include: physical, psychological, and social aspects.
4. The importance of communication and empathy.

FACT BOX

A serious adverse incident is defined as any event or circumstance that led or could have led to serious unintended or unexpected harm, loss or damage to women and/or their newborn baby.

Chapter 11: Postnatal care: subsequent visits

11.1: Risk assessment and planning

Resources	
■ Blood pressure machine	■ Newborn weighing scale
■ Blood taking equipment and blood forms	■ Midstream urine sample bottles
■ Postnatal record	■ Urine dipsticks
■ Thermometer and stethoscope	■ Paper and pens

Key teaching points

The postnatal period is a time when women can face physical risks, as well as possible pain after childbirth and emotional vulnerability. During the risk assessment of the mother and newborn, the healthcare providers can look out for potential physical and physiological problems. Early identification will enable prompt provision of care.

One of the Facilitators can play the mother. The other Facilitator can give the participants the history and then ask one of them to play the role of the healthcare provider and conduct a full postnatal assessment of the woman. Point out to the participants that there is equipment available on an adjacent table for them to use. The expected actions of the participants and the outcomes of the visit are outlined below. If the participants fail to undertake a full assessment of the woman as outlined below, the Facilitator can lead them gently through the progress.

Key learning outcomes

- Understand the rationale and principles of routine postnatal care for the mother and essential newborn care.
- Conduct a risk assessment of the mother and newborn to detect complications, immediately after giving birth.
- Carry out a postnatal risk assessment for both the mother and newborn.
- Recognise postnatal complications in both the mother and newborn.
- Provide relevant information/education/counselling to women attending postnatal care.
- Plan appropriate future postnatal care visit intervals and provide emergency contact details in case of danger signs.

History

A woman arrived at the postnatal clinic 48 hours after the delivery of her first newborn at home. She was told by her traditional birth attendant that the labour was normal and she did not need to attend the hospital for the delivery. When the newborn was finally delivered, the mother suffered serious tears. The tear was sutured by the traditional birth attendant using local materials, in a non-sterile environment. The mother has a fever and is trying to breastfeed. Her breasts are engorged. The newborn looks well, but hungry.

Expected actions

Facilitator:	What questions would you want to ask the mother?
Participant:	Introductions using respectful maternity care principles Greet the mother and introduce yourself and give explanation for the postnatal check for her and her newborn. Ask how is she feeling? is she in pain, is she pale, is she bleeding? How long has she had the fever, does she have any other complaints? Prepare the mother for the examination (not disrupting breastfeeding).
Facilitator:	What would you look for on examination?
Participant:	Ensure privacy, consent and chaperone present Wash hands and conduct a head-to-toe physical assessment: Check the mother for pallor. Check her clinical signs: temperature, blood pressure, pulse, respiratory rate **Full examination:** ■ Breast examination ■ Assessment of effective breastfeeding ■ Abdomen examination – assess uterine involution, ■ Genital examination ■ Normal postpartum bleeding and lochia (check the colour and if it smells) ■ Check the legs ■ Bladder and bowel function ■ Emotional factors ■ Record all postnatal care given including findings in postnatal register and Mother Child Booklet **Newborn** ■ Clinical examination ■ Weigh the newborn ■ Assess for presence/absence of danger signs (including jaundice) ■ Assess breastfeeding
Facilitator:	On inspection of the mother's abdomen, it is distended above the umbilicus. On palpation of the abdomen, the fundus is 2 finger widths above the umbilicus. The fundus is firm and tender, there is excessive bleeding, dark red with some clots. What investigations would you like to do?
Participant:	Check Hb and rapid diagnostic test for malaria.

Facilitator:	What are your concerns and how are you going to treat this mother? (malaria negative, Hb 8g/dl)
Participant:	Expect them to say concerns, (infected perineum, retained products, mastitis, sepsis). Ask if the women if she knows if the placenta was complete or not. **Prescribe:** ■ Antibiotic therapy (per local protocol) ■ Iron therapy ■ Pain management and anti-pyrexials (take regularly) ■ Apply a warm compress for the breast engorgement Refer to a higher-level healthcare facility for complications due to a possible retained placenta. Teach the woman how to hand express (give the milk via cup or spoon) and advise on a more frequent feeding pattern. Symptoms can be relieved in 2-3 days, advise the mother to return sooner if no change. **Other:** Confirm the method of family planning used or help the mother decide on which method to use and help her start it. If HIV positive, give antiretroviral (ARVs) for prophylaxis or treatment, **Newborn:** Give tetracycline eye ointment, vitamin K Catch up on vaccinations not done at birth
Facilitator:	How are you going to advise and follow-up this woman and her newborn?
Participant:	Assist the woman to plan for the referral and child care. Counsel the woman on the danger signs to watch out for both for the other and newborn.

Discussion points

1. Discuss the danger signs and emergency planning in your healthcare facility.
2. How can care for women who cannot access a healthcare facility in the postnatal period be planned, is there any community postnatal care?
3. Timing and number of postnatal visits, is this the same schedule as your setting?
   - □ At least 3 additional postnatal visits: Day 3 (48 to 72 hours)
   - □ Between Days 7 to 14
   - □ 6 weeks after birth

11.2: Clinical assessment of the mother

Resources	
■ Blood pressure machine	■ Newborn weighing scale
■ Blood taking equipment and blood forms	■ Urine sample bottles
■ Postnatal care record	■ Urine dipsticks
■ Thermometer and stethoscope	■ Paper and pens

Key teaching points

One of the Facilitators can play the woman. The other Facilitator can give the participants the history and then ask one of them to play the role of the healthcare provider and conduct a full postnatal assessment of the woman. Point out to the participants that there is equipment available on an adjacent table for them to use. The expected actions of the participants and the outcome of the visit is outlined below. If the participants fail to undertake a full assessment of the woman as outlined below the Facilitator can lead them gently through the progress.

Key learning outcomes

- Carry out a postnatal full assessment of a woman and her newborn.
- Provide relevant information, education and counselling to women attending postnatal care.
- Plan appropriate postnatal care visit intervals and provide contact details.

History

A woman has arrived at the postnatal clinic one week after delivery of her fifth child. She laboured and delivered her newborn in the local healthcare facility with the help of a midwife. She was told she bled profusely following delivery and was told to come back after one week to check her iron levels. She feels tired looking after a newborn and the other children. She complains of passing urine frequently. She is breastfeeding her newborn. The newborn received a clinical examination after delivery.

Expected actions

Facilitator:	What questions would you want to ask the woman?
Participant:	Introductions using respectful maternity care principles Greet the woman and introduce yourself and give explanation for the postnatal check for her and her newborn Ask how is she feeling? is she in pain, is she pale, is she bleeding? How long has she had the fever, does she have any other complaints? Prepare the woman for the examination (not disrupting breastfeeding).

Facilitator:	What would you look for on examination?
Participant:	Ensure privacy, consent and chaperone present Wash hands and conduct a head-to-toe physical assessment: check Mother for: pallor, Check vital signs: temperature, blood pressure, pulse, respiratory rate Full examination: ■ Breast examination ■ Assessment of effective breastfeeding ■ Abdomen examination – assess uterine involution ■ Normal postpartum bleeding and lochia (check the colour and if it smells) ■ Check the legs ■ Emotional factors ■ Record all postnatal care given including findings in postnatal register and mother child booklet Newborn ■ Weigh the newborn (check weight loss) ■ Assess for presence/absence of danger signs (including jaundice)
Facilitator:	On inspection of the mother's abdomen, the uterus can just be felt at the level of the symphysis. All observations are normal. What investigations would you like to do?
Participant:	Check Hb and rapid diagnostic test for malaria, urinalysis.
Facilitator:	Hb 9g/dl, malaria negative. Confirmed urine infection. Postpartum iron deficiency is common and anaemia caused by iron deficiency has been linked with which consequences?
Participant:	■ Increased risk of postnatal depression ■ Increased prevalence of urinary tract infections ■ Fatigue and exhaustion ■ Insufficient milk syndrome ■ Reduced breast milk quality

Facilitator:	How are you going to treat this mother and newborn?
Participant:	**Mother** Address complaints Screen for postnatal depression using Whooley questions Treat anaemia per local protocols Treat the urinary tract infection Confirm breastfeeding progress **Newborn** Confirm wellbeing and address complaints Assess breastfeeding Confirm immunisations are up-to-date
Facilitator:	What health education/advice would you give?
Participant:	■ Personal hygiene and handwashing ■ Parenting and emotional attachment ■ Maternal mental health ■ Breast care ■ Exercises ■ Care of the perineum ■ HIV Counselling and testing/re-testing ■ Family planning counselling (healthy timing/spacing of pregnancy) ■ Harmful practices to avoid ■ Maternal nutrition ■ Use of long-lasting insecticide-treated bed nets to prevent malaria ■ Return date for next postnatal visit

Discussion points

1. At each postnatal assessment, women can be asked about their emotional wellbeing, including mood and behaviour.
2. Postnatal depression can manifest as different symptoms, which include insomnia, weight loss, lack of interest in appearance, inability to get out of bed, and feelings of worthlessness or guilt.
3. When undertaking any assessment, it can include a history of previous psychiatric disorders and current mental health.

Chapter 12: Postnatal care for the newborn baby

12.1: Examination of the newborn baby

Resources	
■ Non-sterile gloves	■ Newborn thermometer
■ Paediatric stethoscope	■ Newborn scales (10g intervals)
■ Newborn mannequins	■ Soft tape measure

Key teaching points

This skills station focuses on the systematic examination of a newborn baby in the immediate postnatal period to ensure that the baby has no abnormalities that need immediate intervention or that will have long term effects on the baby.

Participants can practice the newborn examination in pairs. Ensure that all participants can practice the newborn examination. The newborn examination can be performed in a systematic manner to avoid missing any critical newborn problems.

Key learning outcomes

- Enable participants to follow a structured concise approach to the examination of a newborn baby after delivery and prior to discharge.
- Learn to recognise any signs of severe illness that require immediate intervention or any congenital abnormalities.

Prior to performing the examination:

1. Identification of the baby
2. Situational awareness – is the mother alive, very ill or has she been transferred?
3. Explain to mother and/or father and/or guardian what you are going to do.
4. Ask the mother and/or father and/or guardian:
   - □ Do you have concerns?
   - □ How is the baby feeding?
   - □ Has the baby passed meconium or urine?

Examination of the newborn

Discuss the requirements for a good environment for examination: warm room (at least 25°C and free from draught) and well-lit. The mother or another carer can be present. It is important to maintain good communication with mother/carer before, during and after the examination. Findings can be discussed with mother/father/guardian.

Head-to-toe examination

Assess	Normal findings
■ Assess for posture and spontaneous movements	■ Flexed posture with spontaneous movements
■ Feel for warmth (take temperature)	■ Temperature 36.5°C and 37.5°C
■ Look for any significant bruising particularly at presenting part (implications for development of significant jaundice requiring treatment or possibility of adverse intrapartum event)	■ Little or no bruising
■ Fontanelles	■ They are easily felt above the forehead and towards the back of the head. Check fontanelles (i.e. open, closed, full, tense, soft, dipped). If bulging upwards or tense need to seek senior support
■ Eyes (check for discharge)	■ No discharge ■ Normal structure
■ Ears	■ Both present and of normally formed
■ Mouth for cleft lip and or palate	■ Intact hard and soft palate
■ Clavicles for fracture	■ No deformity
■ Symmetrical movement of arms, newborn reflexes	■ Rooting reflex ■ Moro reflex ■ Stepping reflex
■ Count fingers	■ 8 fingers, 2 thumbs
■ Look at palm (e.g. for features of trisomy 21 associated with single palmar crease)	■ Normal palm crease
■ Assess breathing rate	■ 30-60 breaths per minute
■ Abdominal	■ The skin should be intact and not be distended (looking for congenital abnormalities e.g. bowel obstruction due to duodenal atresia
■ Cord	■ Check cord is tied, dry and clean

■ Anus	■ Normal position and patent
■ Male newborn: Check descent of testicles, look at penis for location of urethral orifice	■ Bilateral testes palpable in the scrotum (soft and mobile) ■ Urethral orifice at the tip of the penis
■ Female newborn: check appearance of the genitalia if it is not normal refer to paediatrician	■ If possibility of ambiguous genitalia i.e. cannot tell whether male or female refer to paediatrician
■ Feet	■ Check and count toes. ■ Check for talipies
■ Turn baby and check spine for spina bifida (occulta)	■ Intact skin and no 'holes' visible over the spine
■ Measurements (length, head circumference)	■ Detect abnormal brain or skull growth (e.g. hydrocephalus) ■ Head circumference ranges at birth for well term babies: Boys: 32cm to 37cm Girls: 31.5cm to 36cm ■ Normal length ranges at birth for well term babies: Length 45-55cm

Discussion points

1. Ask the mother or carer if they have any concerns.
2. Conduct a systematic examination from head-to toe looking for signs of severe illness and any congenital abnormalities.
3. Refer or request support from a senior healthcare provider if any abnormal findings are noted or significant concerns detected.

12.2: Clinical assessment of the newborn baby

Resources	
■ Thermometer	■ Glucometer
■ Stethoscope (paediatric)	■ Clock
■ Weighing scale	

Key teaching points

- This skill covers how to conduct and interpret a clinical assessment of the newborn baby to ensure that all healthcare providers involved in the training understand the need for thorough screening of newborn babies and to understand the need for appropriate and timely decision making especially around the care of acutely sick newborns.
- Emphasise the use of the observation chart as a tool to guide assessment of newborns as well as recommended actions to take when needed.
- The key aim is to train the participants to recognise the unwell newborn and treat and refer as necessary based on the specific scenarios given and to hold discussions around these. It is important to remind them that previous knowledge gained in other sessions of the training package can be applied as much as possible in the completion of this exercises.
- Arrange the participants to work in pairs for the first case example and then they can separate and do individual work in the subsequent scenario.
- Ask the participants to discuss the observations, how they are charted in their setting and explain their interpretations.

Key learning outcomes

- Understand the importance of clinical observations to conduct basic observations or assessments, familiarise with the normal ranges and identify abnormal observations.
- Learn, practice and understand the importance of undertaking regular observations during the assessment of newborns.

Instructions

- At the start of the session set up the stations to allow for at most four trainees per team to work with. These stations must each have all the equipment mentioned in the table above.
- One of the Facilitators will read out the case while the other Facilitator will moderate all the discussions around the case.

Expected actions

Facilitator:	Ask participants to list some of the reasons why a newborn may be hypothermic.
Participant:	Infections (neonatal sepsis), intracranial haemorrhage (commonly in premature babies) or drug withdrawal in neonates. There may be exposures to cold environment or poor thermal care for the newborn as well as prematurity as the underlying causes. ■ Heart rate: The newborn heart normally ranges between 120 to 160bpm depending on how close old they are. Infections and problems with preterm babies may result in bradycardia. ■ Respiratory rate*:* Neonates have a respiratory rate that ranges between 30 and 70 per minute. When they are very well, the breathing is regular, full and they appear relaxed. They may occasionally have some irregularities. However, when rate is 70 or higher it is too high.
Facilitator:	What could cause fast breathing in the newborn?
Participant:	Infection especially pneumonia, any fever, other illnesses, etc. ■ Respiratory distress: The newborn can be assessed for respiratory distress using subcostal recession (or lower chest indrawing), grunting and other features. It is usually a sign of acute breathing difficulties in newborns such as neonatal pneumonia.

The Facilitator can take the participants through the other parts of the score including consciousness level of the newborn including a history of convulsions, feeding history and whether urine and meconium has been passed. One Facilitator can read the case scenarios while the other leads the discussions

Case 1

The woman presented to the health centre this morning with her newborn baby wrapped completely in cloth. She is concerned that her newborn baby is very sick. When asked why she thought the newborn was sick, she looked very agitated and though she could not point to anything, she insisted that she knew the newborn was very sick.

Expected actions

Facilitator:	What would you do?
Participants:	The key point here is that the mother cannot tell exactly what was wrong with the newborn, but her worry and decision to come to the healthcare facility can alert the healthcare provider that the newborn might be very sick. ■ To allay her fears, ask to see the newborn immediately rather than waste time on history before seeing the newborn. ■ Prepare to assess the newborn yourself and whilst doing the examination, elicit more history from the mother.
Facilitator:	What questions would you want to ask the mother?
Participants:	Elicit other signs that the mother might have ignored such as breastfeeding, abdominal distension, high or low temperature, grunting, fast breathing, floppiness, irritability, jaundice, vomiting, history convulsion. It may be necessary to get more details of the pregnancy and birth to elicit any complications such as prolonged labour lasting >24 hours? Prolonged rupture of membranes and other risks or signs of infection; pre-eclampsia in late pregnancy, any treatment with any medication.
Facilitator:	What would you look for on examination of the newborn?
Participants:	General assessment, colour, tone, full newborn check, pulse rate, respiratory rate, temperature, jaundice, blood glucose, check cord. Document observations.
Facilitator:	On examination, the newborn was floppy and not responsive, the skin was very cold and temperature was 34.5°C, respiratory rate was 20 per minute but there was no substernal recession (chest in-drawing) and the pulse rate 120bpm. When asked, the mother said she had a very difficult delivery and the newborn's left forearm made repetitive quick movements after the birth but the attendant said the newborn would get better. She tried to feed but the newborn did not take the breast. Her mother-in-law said the newborn was not hungry for the breast and so fed some sugar solution but the newborn spills it when fed. 1. How many "danger signs" did you pick from the examination? 2. Which other key findings would you also want the health worker to do or report?

Participants:	1. There were 5 danger signs including: □ Unresponsive/floppy newborn □ History of convulsion □ Newborn not feeding □ Temperature too low □ Respiratory rate too low 2. Other key findings to report: □ Jaundice on the first day □ Weight of the newborn
Facilitator:	The mother's story suggests that she suspected was malaria because her temperature was spiking but she also had dysuria. It was whilst during the febrile episode that the labour started and the liquor was foul-smelling and deep green. How would you manage the newborn?
Participant:	Full blood count (or Hb if full blood count is not possible), white blood cell count Rapid diagnostic test for Malaria, thick film, midstream urine sample, HIV and syphilis tests, blood sugar, blood grouping and cross-matching, blood culture (if available).
Facilitator:	What are your differential diagnoses? Discuss various causes of floppy neonate with hypothermia. ■ Neonatal sepsis ■ Hypoglycaemia ■ Complications of Preterm birth (such as hypoxic ischaemic encephalopathy) or Asphyxia How are you going to treat this newborn?
Participant:	Immediate treatment or referral with pre-referral stabilisation If available give antibiotics such as IM or IV ampicillin and gentamicin for at least 2 days and reassess and refer if not responding to treatment or continue treatment. If families do not accept or cannot access referral care, these infants can be treated with oral amoxicillin, 50mg/kg per dose twice daily for seven days. Where available, conduct a blood culture and sensitivity and treat accordingly taking into consideration the newborn baby's weight Thermoneutral environment and/or Kangaroo mother care Vitamin K, Cord dressing with Chlorhexidine, Tetracycline for the eyes, immunisation. Promote breastfeeding Hygienic care

Case 2

A nurse reviews a mother, who was referred from a small community clinic to your healthcare facility. The nurse conducted a review of the case and has the following notes:

The newborn was delivered on the day before and the birth weight was recorded as 1.9kg and the baby is feeding. The temperature is 35.7°C. The newborn is lethargic, is grunting with several periods of apnoea followed by episodes of rapid breathing rates. They counted the respiration three times and got 78, 69 and 84 breaths per minute respectively.

Expected actions

Facilitator:	What additional actions do you want to undertake?
Participants:	Conduct a complete assessment of the newborn.
Facilitator:	What would you look for on examination of the newborn?
Participants:	General assessment to elicit other important signs: colour, tone, full newborn check, chest in-drawing, heart, respiratory rate, temperature, jaundice, blood glucose, check cord.
Facilitator:	How would you manage the newborn based on the above observations?
Participant:	Full blood count (or Hb if a full blood count is not possible), white blood cell count Rapid diagnostic test for Malaria, thick film, midstream urine sample, HIV and syphilis tests, blood sugar, blood grouping and cross-matching, blood culture (if available).

Discussion points

1. Complete examination of the newborn necessary to pick early danger signs.
2. Regular observations of the newborn on an observation chart.
3. Referral or prompt medical intervention based on the clinical observations.

12.3: Management of neonatal infection

Resources	
■ Pens	■ Flip chart

Key teaching points

The purpose of this station is to discuss the presentation of neonatal infections and differential diagnoses. You will require at least two Facilitators. It is suggested that the participants cannot be told what topic will be addressed in the session. One of the Facilitators acts as a carer whose baby is unwell. The other Facilitator will read out the history to the participants and ask them to note down the important details that will help management, treating it as a real-life scenario. The Facilitator will then discuss the symptoms and other direct questions that need to be asked as detailed below and explain that the session is about neonatal infections which account for more than a third of neonatal deaths.

The participants will then break into groups and the Facilitators will support them to go through the management (history, examination, investigations and treatment) of newborns with infections. The critical importance of the session is to reiterate that, unlike adults or even older children, neonatal infections may present with very vague and covert symptoms and signs which even mothers sometimes overlook. For the baby's illness, the mother's history is also key.

Management objectives can also include prevention or minimising long-term residual effects and teaching the carer about ways to prevent future infections e.g. hand hygiene, keeping the baby warm and in constant touch with the mother including Kangaroo mother care, appropriate umbilical cord care, appropriate eye care and exclusive breastfeeding.

Key learning outcomes

- Recognise the sick newborn.
- Understand the principles of assessment, diagnosis, management of neonatal infection.
- Understand the integrated approach to mother and newborn (risk factors for infection).
- Understand when and how to make a referral to a higher-level healthcare facility.

History

A woman presents to a primary level healthcare facility two days after giving birth at home with family support. There were no complications. Her newborn is not as active as she was initially and refused to suck at the breast throughout the previous night.

Expected actions

Facilitator:	What questions would you want to ask the mother?
Participant:	■ Check for other signs from the newborn that the mother might have ignored such as high or low temperature, grunting, fast breathing, floppiness, irritability, jaundice, vomiting, convulsion or abdominal distension. ■ More details of the pregnancy and birth? ■ Length of labour? Prolonged rupture of membranes? ■ Assess for risk factors for infection ■ Is the mother experiencing fever? ■ What is her HIV/Malaria/TB/syphilis status? ■ What is the duration of her various symptoms if any? ■ Has she been treated with any medication? ■ Use of sterile equipment to cut the cord at birth?
Facilitator:	What would you look for on examination of the baby?
Participant:	General assessment, colour, tone, full baby check. Pulse rate, respiratory rate, temperature, pallor, oedema, fontanelles Check the cord stump for signs of infection and dressing. Document observations on an early warning system score card.
Facilitator:	The pulse rate is 155bpm, respiratory rate 68, temperature 37.7°C. There is surrounding erythema around the umbilicus. What investigations can be done?
Participant:	Full blood count (or Hb if a full blood count is not possible), white blood cell count. Rapid diagnostic test for Malaria, thick film, midstream urine sample. HIV and syphilis tests, blood sugar, blood group for mother and newborn. Wound swab, blood culture (if available).
Facilitator:	What are your differential diagnoses? Discuss various causes of neonatal infection. ■ Preterm premature rupture of membranes ■ Dehydration ■ Infection cord ■ Pneumonia ■ Urinary tract infection ■ HIV If this is a case of infected cord, what complications might you expect?
Participant:	Umbilical infection

Facilitator:	How are you going to treat this newborn?
Participant:	Clean and dress the cord, administer paracetamol. If available, administer antibiotics such as IM or IV Ampicillin and Gentamicin for at least 2 days and reassess and refer if not responding to treatment or continue treatment. If families do not want to attend or cannot access referral care, these infants can be treated with oral Amoxicillin, 50mg/kg per dose twice daily for seven days. Where available, conduct a blood culture. IM Cloxacillin/Gentamicin or IM Ampicillin and Gentamicin per the newborn weight. Refer the infant to an appropriate healthcare facility. Promote breastfeeding and Kangaroo mother care.

Discussion points

1. List the causes of neonatal infection.
2. Use of an appropriate communication tool for referral.
3. Stabilisation prior to referral.

12.4: Management of neonatal jaundice

Resources	
■ Pens	■ Flipchart

Key teaching points

More than half of all normal babies have some jaundice usually between three to five days after birth. The purpose of this station is to discuss how participants can differentiate this normal (physiological) from abnormal (pathological) jaundice and how to manage the baby in both situations. They will also understand the causes of jaundice and understand that identifying and treating the underlying cause(s) is the key to the successful management of the baby.

One of the Facilitators will act as the woman whose baby is unwell. The other Facilitator will read out the history to the participants and ask them to note down the important details that will help management as if this were a real-life scenario. The Facilitator will ask what the differential diagnoses could be. The Facilitator will then discuss the symptoms and other direct questions that need to be asked as detailed below. The critical discussions can emphasise that early intervention is paramount to success in the treatment of jaundice to avoid complications. There is also the need to identify the underlying cause and treatment can be tailored to both the jaundice itself and the underlying cause simultaneously. Again, this station can stress the distinctions between term and preterm babies in the manifestation and course of jaundice.

Key learning outcomes

- Understand the definition and types of jaundice.
- Understand the causes of jaundice and the reasons for early interventions.
- Understand treatment of jaundice based on serum and bilirubin levels.

History

Case 1

A mother came to the outreach clinic having noticed that her 5-day old newborn had developed yellow discolouration of the white part of the eyes. The newborn is breastfeeding normally.

Expected actions

Facilitator:	What questions would you ask the mother?
Participant:	Gestational age of the newborn at birth? Is the newborn generally well? Feeding regularly? When the jaundice started, progression, accompanying signs such as high or low temperature, evidence of infection. Other signs such as pale stools and dark urine (liver disease). Maternal history to rule out syphilis and infections in utero. Medical problems such as diabetes, ABO incompatibility, Rhesus isoimmunisation

Facilitator:	What would you look for during examination?
Participant:	When looking for jaundice (visual inspection): Check the naked newborn in bright, preferably natural light. Examination of the sclera, gums and blanched skin is useful across all skin tones.
Facilitator:	What investigations can be done?
Participant:	None, this is likely to be normal physiological jaundice. Defined by: yellow coloration of skin and mucous membranes.
Facilitator:	What treatment and advice would you give?
Participant:	Educate/discuss with the mother to look for danger signs: ■ Previous newborn with early jaundice (on first day of life) or family history of anaemia, enlarged liver, or removal of spleen ■ Haemolytic jaundice, glucose-6-phosphate dehydrogenase (G6PD) deficiency or Rhesus (Rh) factor or ABO blood group incompatibility lasting >14 days in term and >21 days in preterm infants ■ Accompanied by fever ■ Deep jaundice: palms and soles of the infant deep yellow (Confirm does not have pale stools and dark urine) ■ Promote and/or continue breastfeeding until newborn feeds well.

Case 2

The mother returns after two weeks, the newborn's feeds have drastically reduced, the palms and soles of the infant are deep yellow and baby has some fever.

Facilitator:	What questions would you ask the mother?
Participant:	When did the feeding start to become irregularly? Does the newborn wake up for a feed? When did, the fever start?
Facilitator:	What investigations can be done?
Participant:	The investigations depend on the probable diagnosis and what tests are available but may include: ■ Checking bilirubin levels ■ Hb or packed cell volume ■ Full blood count to identify signs of serious bacterial infection (high or low neutrophil count with >20% band forms) and signs of haemolysis ■ Blood type of infant and mother and Coombs test Syphilis serology

Facilitator:	What treatment and advice can be given?
Participant:	Treat with phototherapy if: ■ Deep jaundice involving palms and soles of the feet ■ Prematurity and jaundice ■ Jaundice due to haemolysis Caution to cover baby's eyes and genitals during phototherapy Continue phototherapy until the serum bilirubin level is lower than the threshold range or until the infant is well and there is no jaundice of palms and soles. If the bilirubin level is very high, you can safely undertake exchange transfusion and can consider doing so. If phototherapy is not available, refer to a neonatal unit. Treat other possible infections: 1. If infection or syphilis is suspected, treat for serious bacterial infection. 2. If fever is present and the infant is from a malarious area, check blood films for malaria parasites, and give antimalarials if positive. May need exchange transfusion if phototherapy fails. Some cases may need discussion with a paediatric surgeon especially if congenital biliary obstruction is suspected.

Discussion points

Discuss the differences between physiological and pathological jaundice.

1. Physiological Jaundice
   - □ Neonate remains completely well.
   - □ Sets in on day 3 after birth.
   - □ Disappears within 2 weeks.
   - □ Common in neonate especially in preterm.
2. Pathological Jaundice
   - □ Jaundice starts on the first day of life.
   - □ Jaundice lasts longer than 14 days in term newborn, 21 days in preterm newborns.
   - □ Jaundice accompanied with fever or other signs of illness.
   - □ Deep jaundice – palms and soles of the newborn are deep yellow.
3. Abnormal jaundice may be due to:
   - □ Serious bacterial infection.
   - □ Haemolytic disease due to blood group incompatibility or glucose 6-phosphate dehydrogenase deficiency.
   - □ Congenital syphilis or other intrauterine infection.
   - □ Liver disease such as hepatitis or biliary atresia (stools pale and urine dark).
   - □ Hypothyroidism.
   - □ If available the following tests could be useful: glucose 6-phosphate dehydrogenase screening, thyroid function tests, liver ultrasound scan to rule out and detect other causes.

12.5: Management of a low birth weight baby

Resources	
■ Thermometer	■ Blankets/dry linen
■ Stethoscope (paediatric)	■ Baby scale
■ Blood glucose testing kit	■ Woollen hat

Definition of a Low Birth Weight Baby: Babies who are either small-for-gestational-age i.e. weigh <2.5kg or below 10th percentile on the customised growth chart or preterm (born before 37 weeks' gestation).

Key teaching points

Low birth weight babies weigh less than 2.5kg at birth. They need special care to survive because they are prone to many complications including difficulty with breathing, poor temperature control, feeding difficulties, low blood sugar, jaundice and sepsis. It is necessary to differentiate the small-for-gestational-age from the premature baby because the challenges and consequent management objectives differ.

The purpose of this station is to emphasise the complications that can arise from a baby having a low birth weight these and equip participants to be able to ensure better outcomes for low birth weight babies. One of the Facilitators will act as the mother of the baby and the other will moderate the discussions with the participants. The latter will read out the history to the participants, asks them to note down the salient details and discusses further probing questions that the healthcare provider can ask and possible differential diagnoses. The expected responses are as detailed in the following sections.

The module objective is to ensure that participants understand that care of the low birth weight babies starts with essential newborn care but that some of these babies will need to be nursed in an incubator or have Kangaroo mother care, to ensure respiration and a thermoneutral environment to keep the baby warm. Importance must be given to ensuring adequate feeding and hygiene to prevent infections and these are especially important in the preterm low birth weight babies. It is also possible to have a preterm that is small-for-gestational-age (i.e. preterm who also had intra-uterine growth restriction).

Key learning outcomes

- Classify low birth weight babies and describing their basic needs.
- Describe routine management of low birth weight babies from birth through to discharge and follow-up.

History

A mother presents to the clinic two days after giving birth at home to twins, one newborn died shortly after delivery and the other appears healthy but is not feeding well. The mother feels the newborn is not getting enough food and has been supplementing the milk with a sugar solution. She thought the situation would get better but the baby is still not sucking very well and she is scared she will suffocate her newborn with her large breasts.

Expected actions

Facilitator:	What questions would you want to ask the mother?
Participant:	More details of the pregnancy and birth and any complications that has arisen from these which may still be persisting? ■ Gestational age at birth? ■ Assess for risk factors for infection for the mother and baby. ■ What is the duration of her various symptoms if any? ■ Has the newborn been given any medication? ■ If the birth was in a healthcare facility and by Caesarean section, the indication will be important.
Facilitator:	What would you look for on examination of the newborn?
Participant:	Before the assessment, make sure the room is warm, wash hands before and after handling the newborn. ■ General assessment, colour, tone, full baby check (look for congenital anomalies e.g. cleft palate) ■ Pulse rate, respiratory rate, temperature, pallor, oedema, fontanelles ■ Weigh the baby ■ Check cord ■ Check sucking and swallowing reflex ■ Document observations on the newborn early warning score After assessment place baby in skin to skin contact with the mother, and place a hat on the newborn head.
Facilitator:	The baby weighs 1850g, the mother's membranes ruptured one day before the twins were delivered. The mother and newborn do not have fevers. What investigations would you like to do?
Participant:	Blood glucose test. Haemoglobin check. High suspicion for neonatal sepsis.
Facilitator:	How are you going to treat this woman? The baby cannot suck but has a swallowing reflex. If the blood glucose is less than 45mg/dL (2.6mmol/L), so you need to treat for low blood glucose.

Participant:	Provide the routine care for newborn ■ If sepsis is not suspected give prophylactic antibiotics IM or IV Gentamicin and Ampicillin. Reassess after two days and continue treatment only if there are signs of sepsis or a positive blood culture. ■ Assess positioning and attachment and exclusive breastfeeding on demand including hand expressing the milk (this will help with stimulating milk production) and feeding the baby using a cup or spoon (IV fluid at maintenance volume per the newborns age if very unwell and unable to feed). ■ Give Vitamin K, 0.4mg/kg/IM. ■ Administer tetracycline eye ointment (if discharge noted from the eyes). ■ Administer scheduled vaccines. ■ Make a follow-up plan for care at home, low birth weight babies must be followed up weekly for weighing and assessment of feeding and general health until they have reached 2.5kg.
Facilitator:	What health education/advice would you give?
Participant:	Counselling on the danger signs and return for immediate consultation ■ Inability to breastfeed ■ Difficulty in breathing ■ Fever ■ Hypothermia ■ Abnormal colouring ■ Discharge from the umbilical cord Prevention of infection ■ Handwashing before handling the newborn ■ Cord care ■ Eye care ■ Kangaroo mother care ■ Make sure the baby sleeps under a long-lasting insecticide-treated bed net ■ Keep the baby away from sick children and adults Special care to keep low birth weight newborn warm To prevent heat loss in a low birth weight baby, the mother can: keep the baby's head covered with a hat (90% of heat is lost through the head, if uncovered); not leave the baby in a room with the doors or windows open. Provide an extra heat source in the room where the baby is kept. Do not undress the baby completely to change the nappy.

Facilitator:	What would you monitor at every visit?
Participant:	At every postnatal visit, you can: 1. Weigh the baby. 2. Monitor respiratory rate (tachypnoea) and breathing pattern (lower chest wall in-drawing). 3. Observe that the baby is breastfeeding optimally. 4. Measure the baby's temperature. 5. If everything is OK, reassure the mother.
Facilitator:	On the third weekly visit the baby is feeding on demand and has gained weight, can the baby be discharged?
Participant:	Low birth weight babies can be discharged when: ■ They show no danger signs or signs of infection ■ They gain weight through breastfeeding alone ■ They can maintain body temperature Counselling on discharge: ■ Exclusive breastfeeding ■ Keeping the baby warm ■ Dangers signs for seeking care

Discussion points

The following are complications that can be seen in low birth weight babies:

- Inability to maintain body temperature
- Difficulty feeding and gaining weight
- Infection
- Breathing problems, such as infant respiratory distress syndrome (a respiratory disease of prematurity caused by immature lungs/lack of surfactant)
- Neurologic problems, such as intraventricular haemorrhage (bleeding inside the brain)
- Gastrointestinal problems, such as necrotizing enterocolitis (a serious disease of the intestine common in premature babies)
- Sudden infant death syndrome

Benefits of Kangaroo mother care

- Breastfeeding: Kangaroo mother care increases breastfeeding rates as well as increasing the duration of breastfeeding.
- Thermal control: Prolonged skin-to-skin contact between the mother and her low birth weight baby provides effective temperature control with a reduced risk of hypothermia.
- Early weight gain: Newborns gain more weight on Kangaroo mother care than on conventional postnatal care.
- Reduced morbidity: Newborns receiving Kangaroo mother care have more regular breathing and are less likely to stop breathing. It also protects against infection.

FACT BOX

Low birth weight
Newborns with a birth weight of less than 2500g. These neonates can usually be managed safely at home with some extra care and support.

Very low birth weight
Newborns with a birth weight of less than 1500g. A life-threatening problem in such tiny neonates is that suckling, swallowing and breathing are not well coordinated, so they require special attention to feed adequately and safely. They also have great difficulty in maintaining their body temperature, so they are at increased risk of hypothermia. These neonates are also susceptible to infections and will need strict hygienic care. They may need advanced life support and can be referred immediately to a hospital with special care facilities for very small newborns.

Classification based on gestational age
A premature baby is a baby born before 37 completed weeks of pregnancy. Based on the gestational age, preterm newborns are further classified as follows:

Preterm between 32 and 36 weeks' gestation usually (but not always) with a birth weight between 1500g and 2500g.
These newborns can usually be managed safely at home with some extra care and support.

Very preterm at less than 32 weeks' gestation
- Born more than two months early.
- The birth weight is usually less than 1500g.
- A 'very small neonate' needs referral for additional care as it is the most vulnerable "small neonate".

12.6: Management of feeding problems in the newborn baby

Resources	
■ Clean examination gloves	■ Baby doll demo model
■ Nasogastric feeding tubes	■ Small piece of cloth to wrap the baby
■ Adhesive tape	■ Litmus paper
■ Mama Breast simulator	

Introduction

A mother's breastmilk is the only food recommended for newborn babies. If newborns are not able to feed, it is a real challenge to the survival of the baby and the family. The purpose of this station is to discuss the presentation of newborns with feeding problems and how these babies can be managed. Newborns with feeding problems are common and may exhibit several symptoms and signs that may vary between individual babies and the severity of the feeding issues. Even among babies born in facilities, mothers often present with feeding problems because healthcare providers fail to teach them the correct breastfeeding techniques, positioning and attachment.

Key teaching points

It is suggested that one of the Facilitators plays the role of the mother who brings the baby to the healthcare facility. The other Facilitator will lead the discussions with the participants including the differential diagnoses as detailed below. There will be stations to teach correct positioning and correct attachment of the baby to the mother and discuss the merits. The important point to stress is that, when feeding problems due to incorrect breastfeeding techniques are avoided, healthcare providers can reduce their daily workload. Remember, hypoglycaemia could be the cause and effect of poor feeding.

Key learning outcomes

- Assess the different newborn reflexes related to oral feeding.
- Recognise and managing common feeding problems.
- Develop the skills of inserting nasogastric tube and cup feeding.

Instructions: How to assess newborn reflexes related to oral feeding

Newborns who cannot breastfeed and/or use alternative feeding methods

1. Give expressed breast milk via a cup or syringe, if the newborn can swallow.
2. If the newborn is too weak to suck and swallow or the baby has been choking or regurgitating after the feed, insert a nasogastric tube.

Reflexes involved in oral (breast) feeding

- Rooting reflex: seen in normal newborn babies, who automatically turn the face toward the stimulus and make sucking (rooting) motions with the mouth when the cheek or lip is touched. This reflex helps to ensure successful breastfeeding.
- Sucking reflex: when the roof of the baby's mouth is touched, the baby will begin to suck.
- Swallowing reflex: consists of both receptive and motor nervous system pathways.

These reflexes are normally fully developed by 36 weeks' gestation.

How to assess the rooting reflex

- The healthcare provider uses a clean finger to touch the cheeks or upper lip of the baby and assesses the baby making sucking motions or turns the face towards the finger.

How to assess the sucking reflex

- Preterm babies may have weak or immature sucking ability.
- The healthcare provider can insert a clean finger in the baby's mouth to check the sucking reflex, an assessment can be made on the rate and strength of the suck.

How to assess the swallowing reflex

When the swallowing reflex is absent or the coordination between sucking, swallowing and breathing is impaired the baby is at risk of choking as the milk can block their airway.

Instructions: Feeding the baby using a feeding cup

Use a reusable plastic cup for feeding breast milk to newborns with breastfeeding difficulties. It is a simple to use, easy to clean and culturally appropriate feeding solution which allows the infant to control the pace of feeding.

How to cup feed your baby

1. Wash and dry your hands before beginning, use a sterile cup each time.
2. Wrap the baby with a muslin cloth to prevent their hands knocking the cup, the cloth can be useful in case of any spillages.
3. Support the baby in an upright position on your lap so that you are both comfortable.
4. Stroke your finger over baby's top lip to encourage mouth opening.
5. Place the cup towards the corners of the baby's mouth, with the cup resting gently on the lower lip.
6. Angle the cup just enough so the (expressed) milk is just touching the lower lip.
7. Wait for the baby to lap the milk, they may start lapping after smelling the milk.
8. It cannot be poured into your baby's mouth.
9. Gently increase the angle of the cup as the milk is swallowed, so that milk is always at the rim.
10. Allow the baby to have short breaks so the baby can pace the feed and take what is needed at each feed. Keep the cup in place during the breaks. The baby will stop when enough milk is taken by closing their mouth.
11. Calculate how much milk was given and record the time.

Instructions: Insertion of a nasogastric tube

Wash hands before and after the insertion of the nasogastric tube.

1. Hold the tip of tube against child's nose.
2. Measure the distance from the nose to ear lobe, then to epigastrium. Mark tube with a pen at this point.
3. Ask the mother or healthcare assistant to hold the baby's head firmly.
4. Lubricate the tip with water.
5. Pass the tip of the tube directly into one nostril, pushing slowly.
6. The tube can pass easily down into stomach without resistance.
7. When correct distance has been reached, fix the tube with tape at the nose.
8. Aspirate a small amount of stomach contents to confirm the tube is in place (blue litmus paper turns pink).
9. If no aspirate obtained, inject some air down the tube using the syringe and use the stethoscope to listen for gurgling sounds in the abdomen.
10. If any doubt, remove the tube and reinsert.
11. When the tube is in place, fix a 20ml syringe, without plunger to the end of the tube and pour in the expressed breast milk.

Discussion points

Main causes of feeding problems:

- Incorrect breastfeeding technique
- Low birth weight baby
- Illness (sepsis, structural abnormalities e.g. cleft palate, oesophageal atresia)

Common problems, for the newborn:

- Not fed well since birth
- Fed well at birth, but has now stopped or feeding poorly
- Not gaining weight
- Difficulty in feeding and/or is small or a twin
- Mother has not been able to breastfeed

Managing a baby with cleft lip and palate

If the baby has a cleft lip, but the palate is intact:

- Try breastfeeding. If successful, follow-up after one week to check growth and weight gain.
- If not successful, give expressed milk using the feeding cup.

A sick baby who is unable to have feeds by mouth or is unable to absorb them

- Provide facilities for the mother to express her milk.
- If the mother is establishing lactation, encourage her to express milk at least 8 times a day, including overnight. When lactation is established, this may be reviewed.
- If the mother is not able to stay with the newborn in the healthcare, ensure that she has access to the use of a breast pump.
- Remind the mother that to maintain her lactation, she will need to express regularly until the baby can start to feed again.

Baby has difficulty fixing at the breast and how to manage

- Frequently encourage the mother as, in most cases, the baby will gradually learn to feed well.
- Ensure that the environment is calm and quiet and that the mother and baby have privacy and are undisturbed during feeding.
- Check positioning and correct if necessary.
- Make sure that the mother and baby are both comfortable and not too warm or too cold. Change the baby's nappy, if necessary.
- Put the baby to the breast before it becomes too hungry and fractious. Do not attempt to put a screaming baby to the breast in the early stages of establishing breastfeeding. Settle the baby if possible first.
- Check whether the mother has flat or inverted nipples.

Where there is no breast milk available, use appropriate formula milk prepared with clean water or use ready-made formula milk if it is available.

FACT BOX

Causes of infant feeding problems

The following are some causes of feeding and swallowing disorders in infants:

- Traumatic birth injuries that lead to neurological disorders, such as cerebral palsy
- Cleft lip and/or cleft palate
- Tongue-tie
- Neck and head abnormalities
- Premature birth
- Low birth weight
- Respiratory problems
- Heart disease
- Gastrointestinal disorders

12.7: Management of thermoregulation of the newborn and Kangaroo mother care

Equipment List	
■ Preemie Natalie (preterm simulator)	■ Educational material
■ Kangaroo mother care kit	■ Thermometer
■ Local piece of cloth	■ Flipcharts and pens

Key teaching points

This station is about how to provide thermal care of a low birth weight and/or a premature newborn and to develop the skills and technique of Kangaroo mother care: skin-to-skin contact. For the first part of the session, one Facilitator can act as a mother of a preterm newborn while the other gives the history to the participants and asks them to attend to the newborn as they in a real-life situation. Ask the participants to repeat the key points from the history.

The second part of this skills station focuses on the teaching of the application of Kangaroo mother care. Demonstrate this skill to all participants, prior to all the participants practising Kangaroo mother care.

Key learning outcomes

- Recognise and preventing hypothermia in a newborn.
- Practice Kangaroo mother care (skin-to-skin contact).

Kangaroo mother care

Ask the participants what is the definition of Kangaroo mother care and the benefits (use the flipchart)

Definition: Kangaroo mother care refers to thermal care through continuous skin-to-skin contact with the mother. It is a cheap effective alternative to incubator care and is especially useful in low resource settings. It enhances/supports exclusive breastfeeding or other appropriate feeding and aids in early recognition/response to illness.

Remember:

- All newborns must be weighed, even those born at home. This can be done at the first postnatal check at the healthcare facility or outreach.
- The birth weight needs to be measured in the first 24 hours.

History

A woman on the postnatal ward has recently delivered a preterm newborn who weighed 1.8kg at birth. The newborn appears to be physically stable, but has a temperature of 35.5°C. How will you provide thermal care?

Expected actions

Part 1: General management of hypothermia and use of Kangaroo mother care

Always follow the general principles of care of the newborn.

If the newborn is a preterm or small-for-gestational-age and in continuous Kangaroo mother care

- Measure the temperature twice daily.
- Teach the mother to observe the newborn's breathing pattern and explain normal variations.
- Show the mother how to rub the newborn's back for 10 seconds to stimulate the baby to breathe anytime there is apnoea.
- Teach the mother to observe the newborn for danger signs such as apnoea, decreased movement, lethargy and poor feeding.
- Discuss when to discontinue Kangaroo mother care for preterm or small-for-gestational-age.

If the newborn is term and Kangaroo mother care is used to manage low temperature

For cases of hypothermia, monitor the rectal temperature every hour for 3 hours. If the temperature increased by 0.5°C per hour over the last 3 hours, continue management and recheck temperature every 2 hours.

- If the temperature does not rise or is rising more slowly than 0.5°C per hour, look for signs of sepsis (poor feeding, vomiting, difficulty in breathing).
- If the temperature is normal, measure the newborn's temperature every 2 hours for 12 hours.
- If the temperature remains normal, observations can be taken twice a day during the duration of the postnatal stay.
- Discuss local practice/participants' experience.

Part 2: Kangaroo mother care

Participants can demonstrate the steps in Kangaroo mother care:

1. Ensure a warm environment (close doors and windows).
2. Keep the newborn in dry clothes, cover the head with a hat.
3. Explain the importance of Kangaroo mother care to the mother (for example, Kangaroo mother care keeps the newborn warm, promotes breastfeeding and reduces episodes of apnoea).
4. While the mother holds the newborn, describe each step of Kangaroo mother care, demonstrate the steps and then allow her to go through the steps herself.
5. Ask the mother to wear light, loose clothing that can accommodate the newborn.

Kangaroo positioning

- Provide privacy to the mother so she can open her clothing at the front, exposing her breasts.
- Request the mother to sit or recline comfortably.
- Undress the neonate gently, except for cap, diaper and socks.
- The newborn can be placed between the mother's breasts for skin-to-skin contact, ensure:
  - The newborn is in an upright position directly on the mother's skin
  - The head can be turned to one side and in a slightly extended position. This slightly extended head position keeps the airway open and allows eye-to-eye contact between the mother and her newborn.
  - The hips can be flexed and abducted in a "frog" position; the arms can also be flexed.
  - The newborn's abdomen can be at the level of the mother's epigastrium.
- Cover the newborn with the mother's shawl or gown. Wrap the neonate-mother together with an added blanket and put a hat on the newborn's head.
- Support the newborn's bottom with a local sling/binder or use a Kangaroo mother care sling.
- The mother and neonate can also sleep together in Kangaroo mother care.

Keep the newborn in this position for 24 hours, every day except for brief breaks. Reassure the mother her newborn can receive most of the necessary daily care, including breastfeeding, while in Kangaroo mother care. The neonate is only removed from the skin-to-skin contact for changing the diaper, general body hygiene and cord care, and to assessing the neonate during the postnatal visit.

When to stop Kangaroo mother care

Kangaroo mother care can be stopped when the infant weighs more than 2500g. Many Kangaroo mother care newborns will start wriggling and this is a sign that they can start being treated like a normal newborn.

Discussion points

1. Discuss the benefits of Kangaroo mother care.
2. Discuss situations when mother is not well enough or not present. Can father or another family member support with this?
3. Why are newborns predisposed to hypothermia? How to prevent and recognise hypothermia. Emphasise the importance of preventing hypothermia and how to routinely prevent it by:
   - Ensuring a warm environment
   - Avoiding early bathing
   - Post-delivery: warm mother = warm baby – provide blankets and warm fluids (porridge) for mother

FACT BOX

Two components of Kangaroo mother care are:

1. **Skin-to-skin contact**: early, continuous and prolonged skin-to-skin contact between the mother and her baby is the basic component of Kangaroo mother care. The infant is placed on its mother's chest between the breasts.
2. **Exclusive breastfeeding**: the baby on Kangaroo mother care is breastfed exclusively. Skin-to-skin contact promotes lactation and facilitates the feeding interaction.

Benefits of Kangaroo mother care include:

- **Continuous skin-to-skin contact** between the baby's front and mother's chest: Skin-to-skin contact starts at birth and is continued day and night. In addition to regulating temperature, it encourages bonding between the mother and baby.
- **Exclusive breastfeeding**: The baby's head is close to the mother's breasts and breastfeeds frequently/on demand. Breastfeeding can start within 1 hour after birth and continue 2-hourly. There is no need to remove the baby from the mother's chest to feed. The cloth wrapped around the mother and baby can just be loosened to breastfeed.
- **Support to the mother**: The mother can continue to do what she normally does while providing Kangaroo mother care. For example, the mother can cook, clean and sleep without interrupting skin-to-skin contact. The father and other relatives can be involved in providing Kangaroo mother care if the mother is sick or needs to be away from her baby.
- Keeps temperature stable and the infant uses less energy and reduces hypothermia (babies becoming clinically cold).
- Keeps the baby's heart and breathing rates stable.
- Keeps oxygenation, oxygen consumption and blood glucose levels equal or better than infants receiving conventional treatment in an incubator.
- Reduces stress in preterm and low birth weight babies, resulting in less crying.
- Sleep patterns are maintained.
- Growth rates are equal to babies not receiving Kangaroo mother care and there is a larger daily weight gain whilst in hospital.
- The baby has ready access to the breast and the mother is more likely to exclusively breastfeed her baby.
- All mothers who give birth to a small baby, whether Kangaroo mother care is being considered, can be encouraged to start expressing their breast milk as soon as possible after delivery.

12.8: Assessment and management of the acutely unwell newborn baby

Resources	
■ Blood sugar monitor	■ Pulse-oximeter
■ Thermometer	■ Oxygen
■ Stethoscope (paediatric)	■ Pens

Key teaching points

Explain that this station is about managing an unwell newborn, presenting with hypoglycaemia. One of the participants can play the mother coming to the clinic with her unwell newborn. The other Facilitator can give participants the history, ask them to deal with the scenario as they would in real life. Point out to the participants that there is equipment available on an adjacent table for them to use. The expected actions of the participants and their outcomes for the Facilitator to feedback are listed below. If the participants are failing to deliver expected treatment, guide them gently through the process. Encourage discussion and team work.

Key learning outcomes

- Understand the early recognition and timely management of the unwell newborn.
- Understand the initial management of the unwell newborn.

History

A woman presents to a primary healthcare facility 6 hours after giving birth with no complications at home with family support. Her baby girl was initially well immediately after birth but is now very lethargic and has not been breastfed.

Facilitator:	What questions would you like to ask the mother? About her physical condition?
Participant:	■ Introductions using respectful maternity care principles ■ Full systematic obstetric and medical history ■ Does she feel generally unwell? ■ Any associated symptoms? ■ Maternal wellbeing – fever, foul smelling discharge, abdominal pain ■ Check her HIV/Malaria/TB status ■ What is the duration of her various symptoms? ■ Has she been treated with any medication?

Facilitator:	What questions would you like to ask the mother? About her newborn's condition?
Participant:	**Has the newborn been fed since birth, if yes:** ■ What was the mode of feeding (breastfeeding/cup feeding)/when was the last feed? ■ Did the newborn feed well/latch on well/waking up for feeds? ■ How long for each feed and frequency? **For breastfeeding** ■ Is the mother producing any milk yet? ■ Has she breastfed before? If so, did it go well or not? ■ Has the mother received any support with the breastfeeding? ■ Has the newborn had any wet nappies/vomited/passed meconium? ■ If not, explore reasons why the baby has not been feeding.
Facilitator:	How would you carry out a rapid assessment of the newborn?
Participant:	Systematic approach **Assessment:** ■ Airways ■ Breathing: rapid breathing, increased effort of breathing (chest wall in drawing, nasal flaring, grunting) ■ Circulation: central capillary refill time <3 sec, colour, rapid pulse rate ■ Disability: tone, conscious level, check the blood glucose Record observations on the newborn early warning score chart.
Facilitator:	On examination, her pulse rate is 180bpm, respiratory rate 70/min and her temperature is 35.5°C, blood glucose <2.6mmol/L (45mg/dL). What does this information tell you? What would be the differential diagnosis and how would you manage this baby?

Participant:	■ This baby is very unwell and requires urgent intervention. ■ Neonatal sepsis ■ Low birth weight or prematurity ■ Feeding difficulties ■ Failure of establishment of breastfeeding ■ Consider that the infant's mother had gestational diabetes Use the structured approach to the interventions: ■ Airway: ensure it is clear, suction any secretions under direct vision, position airway (neutral position) to keep it patent) ■ Breathing: provide oxygen (ideally via nasal cannula), check oxygen saturations (aiming for >92%) ■ Circulation: consider iv access if possible for intravenous fluids if impaired perfusion (10ml/kg or 0.9% Sodium Chloride) ■ Disability: management of hypoglycaemia as discussed below ■ Exposure: consider giving intravenous or intramuscular Ampicillin and Gentamicin (refer to WHO manual for managing newborns for the recommended doses)
Facilitator:	■ What are the main symptoms of hypoglycaemia (blood glucose less than 2.6mmol/L (Note: some countries use less than 2.6mmol/L. There is no real evidence for an exact value to be used. The main learning point is to recognise hypoglycaemia.)
Participant:	■ Lethargy ■ Drowsiness or unconsciousness ■ Convulsions ■ Eyelids partly open or retracted ■ Hypothermia (temperature less than 36.5°C). ■ Irritability ■ Sweating
Facilitator:	**Case scenario A:** ■ If the blood glucose is less than 2.6mmol/L (45mg/dL) but at least 1.1mmol/L (25mg/dL): how would you treat this newborn?
Participant:	■ Allow the baby to breastfeed, if conscious. ■ If the baby cannot be breastfed, give expressed breast milk using assisted feeding (refer to feeding difficulties). ■ Measure blood glucose in three hours or before the next feed (can be before if baby's condition deteriorates). ■ Once the blood glucose is 2.6mmol/L (45mg/dL) or more on two consecutive measurements, follow instructions for frequency of blood glucose measurements after blood glucose returns to normal (below).

Facilitator:	**Case scenario B:** ■ If the blood glucose is less than 25mg/dL (1.1mmol/L) or unconscious, how would you treat and manage this baby?
Participant:	■ Treat the baby with either breastmilk (oral or by nasogastric tube) if baby is conscious or iv 10% Dextrose, if the baby is unconscious. ■ Establish an IV line, if possible. ■ Give a bolus of 2ml/kg body weight of 10% glucose IV slowly over five minutes. ■ If an IV line cannot be established quickly, give 2ml/kg body weight of 10% glucose by nasogastric tube. ■ Infuse 10% glucose at the daily maintenance volume per the baby's age (via nasogastric tube if no iv access) (Refer to WHO manual to daily fluid requirement) ■ Measure blood glucose 30 minutes after the bolus of glucose and then every three hours: □ If the blood glucose is less than 1.1mmol/L (25mg/dL), repeat the bolus of glucose (above) and continue the infusion. □ If the blood glucose is less than 2.6mmol/L (45mg/dL) but is at least 1.1mmol/L (25mg/dL) at any measurement, continue the infusion and repeat the blood glucose measurement every three hours until the blood glucose is 2.6mmol/L (45mg/dL) or more on two consecutive measurement.; □ Once the blood glucose is 2.6mmol/L (45mg/dL) or more for two consecutive measurements, allow the baby to begin breastfeeding. If the baby cannot be breastfed, give expressed breast milk using an alternative feeding method (See 14.2 Management of feeding problems in the newborn). As the baby's ability to feed improves, over a three-day period slowly decrease the volume of IV glucose while increasing the volume of feed. Do not discontinue the glucose infusion abruptly.

Facilitator: How often can clinical observations be conducted for a newborn baby?

Participant:

Condition	Frequency of observations
Babies born to mothers with one or more risk factors for bacterial infection: ■ Maternal Group B streptococcal carriage/infection during the current pregnancy (with or without intrapartum antibiotic prophylaxis) ■ Previous affected child with Group B streptococcal sepsis ■ Prelabour rupture of membranes (>24 hours) ■ Spontaneous preterm labour (<37 weeks) ■ Intrapartum fever (>38°C) ■ Chorioamnionitis	Observations should be performed at 1 and 2 hours of age and then 2 hourly for a further 10 hours
Receiving Antibiotics for suspected or proven infection.	Observations as above for first 12 hours, then 4 hourly whilst on treatment.
At risk of Hypoglycaemia (<37 weeks, <10th centile, Infant of a diabetic mother).	Observations required before 3 hourly feeds until glucose measurements are stable.
Meconium stained liquor If there is grade 1 Meconium.	Newborn is to have observations at 1 and 2 hours.
If there is grade 2 or 3 Meconium.	Observations can be performed at 1 and 2 hours of age and then 2 hourly for a further 10 hours.
Newborn causing other concerns.	Use clinical judgement.

This is a minimum requirement for observation frequency and midwives and medical staff can use their clinical judgement in each individual case.

Facilitator:	How would you arrange for mother and newborn to be transferred to a secondary healthcare unit?
Participant:	**Communication:** ■ Inform parents/key family members of need for referral. ■ Identify and verbally communicate with referring healthcare facility prior to referral, if possible. ■ Write referral letter/summary of both maternal and neonatal key details of health status and interventions, **Transport:** ■ Discuss with seniors need for ambulance and access, ■ If healthcare facility transport is used, consider a check list of drugs and equipment required for safe transfer, **Patient status:** ■ Ensure the newborn is fit enough for transfer. ■ May need to have conversation around palliative care if outcome is likely to be very poor.

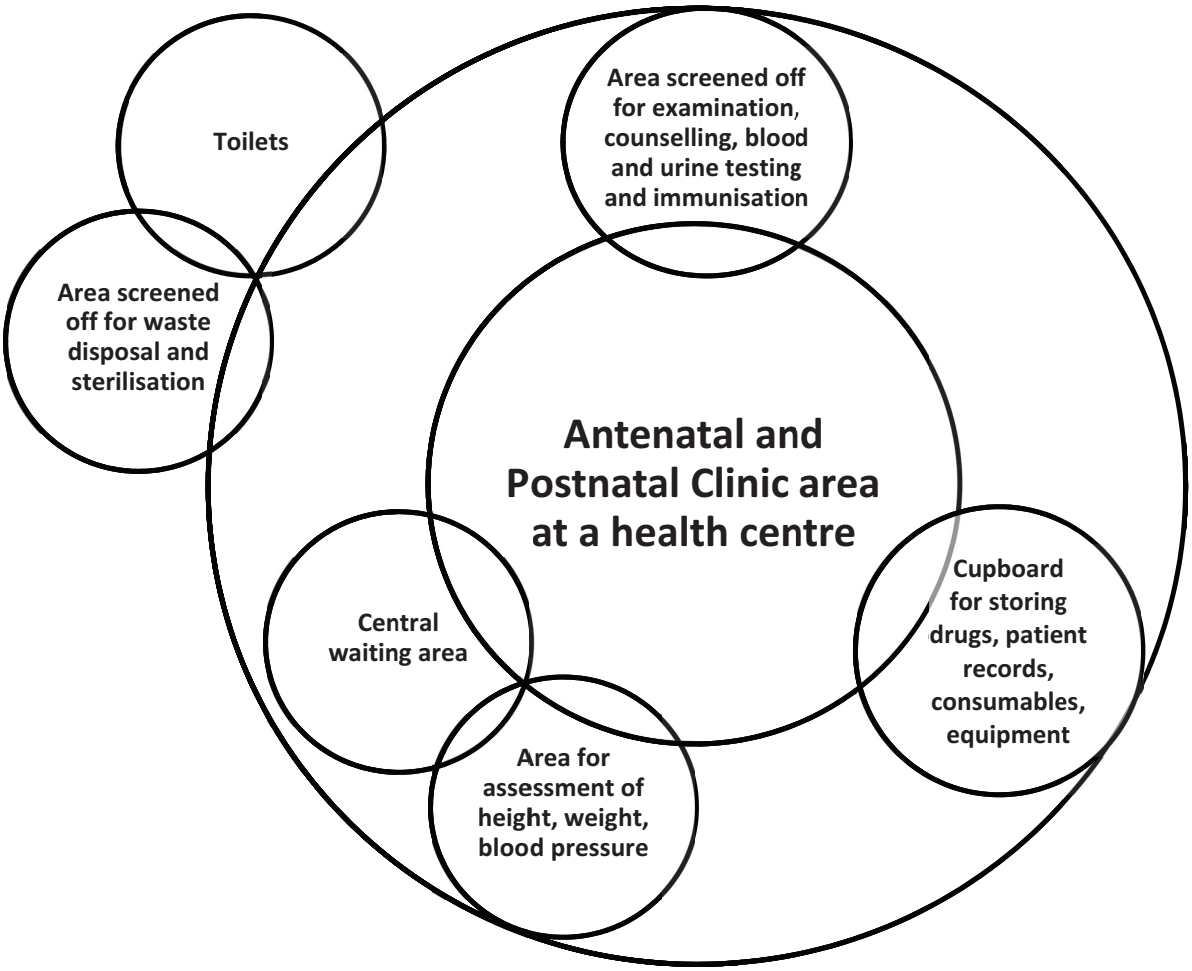
Discussion points

1 It is very important to stress the importance of breastfeeding if possible even in the HIV-positive mother in low- and middle-income countries, where using replacement feeding is associated with reduced survival of infants.
2. Stress that mostly blood glucose cannot be measured on the spot, so it may have to be sent for the clinical diagnosis even though this is inaccurate.
3. Hypoglycaemia can be routinely prevented by frequent small feeds (breastfeeding preferred) and treatment of suspected intercurrent infection.
4. If convulsions occur, exclude other causes such as malaria, meningitis, thiamine deficiency, hypo/hypernatremia.
5. Mention tetanus as a cause of convulsions, mainly at the end of the first week.

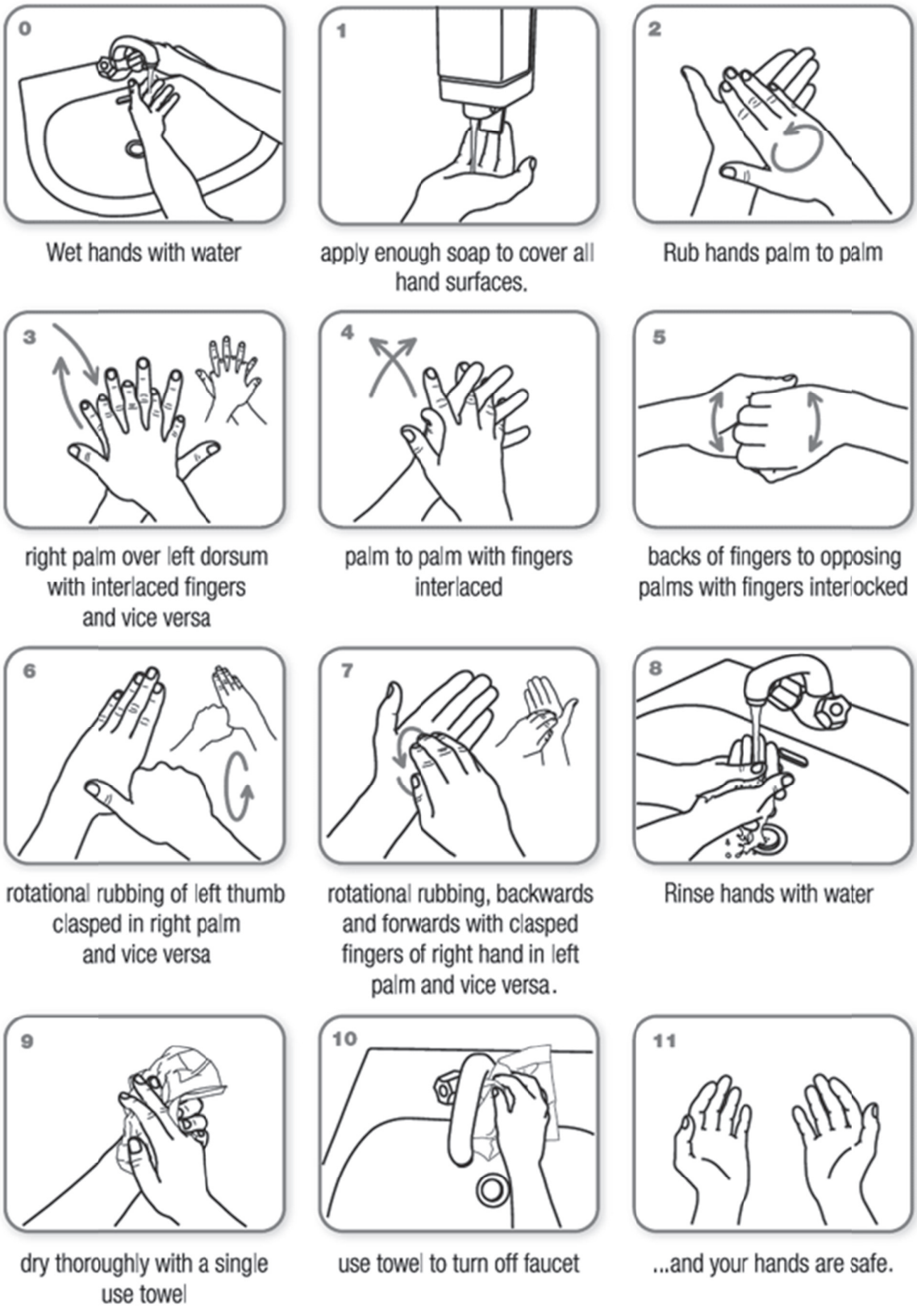
Appendices

Appendix 1: Suggested layout for an antenatal and postnatal clinic

A suggested layout for an antenatal and postnatal clinic at either a small health centre or a larger hospital when no separate rooms are available:



Appendix 2: Handwashing technique



Appendix 3: Use of obstetric ultrasound during and after pregnancy

1st Trimester	2nd Trimester	3rd Trimester	Intrapartum	Postnatal
■ Pregnancy dating/gestational age assessment which is most accurate between 10+0 and 13+6 weeks. ■ Pregnancy localisation in cases of suspected ectopic pregnancy. ■ Assessment of early pregnancy bleeding to confirm viability before management of suspected miscarriage. ■ Chorionicity and placentation in multiple pregnancy. ■ Nuchal Translucency measurement as part of downs syndrome screening.	■ Fetal anomaly scan at between 18 and 22 weeks. ■ Cervical length assessment in suspected cervical insufficiency. ■ Uterine artery flows in women at high risk of preeclampsia and intrauterine growth restriction. ■ Placenta localisation for placenta praevia and accreta. ■ Intrauterine fetal death confirmation.	■ Fetal growth and wellbeing in suspected small-for- gestational age, intrauterine growth restriction and previous stillbirth. ■ Assessment of large for gestational age babies. ■ Assessment of fluid volume for oligohydramnios and polyhydramnios. ■ Presentation to rule out abnormal lies such as breech, transverse and unstable lies. ■ External cephalic version as an aid to diagnosis and the procedure. ■ Intrauterine fetal death confirmation.	■ To confirm presentation in labour e.g. suspected breech. ■ Twin delivery to aid in fetal localisation. ■ Localisation of fetal heartbeat especially in high body mass index. ■ Intrauterine fetal death confirmation.	■ Late postpartum bleeding to rule out retained placental tissue (commonest cause is endometritis).

Appendix 4: Whooley questions for depression screening

1. During the past month, have you often been bothered by feeling down, depressed or hopeless?	□ Yes	□ No
2. During the past month, have you often been bothered by little interest or pleasure in doing things?	□ Yes	□ No
A third question should be considered if the woman answers 'yes' to either of the initial questions, 3. Is this something you feel you need or want help with?		

'Yes' to one (or both) questions = positive test (requires further evaluation)
'No' to both questions = negative test (not depressed)

- A positive test identifies women who may benefit from further evaluation.
- A negative test essentially rules out depression.
- The Whooley questions cannot be used to diagnose or measure the severity of depression.
- Clinical judgement should always be used when assessing depression.

Appendix 5: Edinburgh postnatal depression scale

Postpartum depression is very common. The Edinburgh Postnatal Depression Scale is a 10-question self-rating scale has been proven to be an efficient and effective way of identifying women at risk for depression related to pregnancy.

Please select the answer that comes closest to how you have felt in the past 7 days:

1. I have been able to laugh and see the funny side of things.
   - ☐ As much as I always could
   - ☐ Not quite so much now
   - ☐ Definitely not so much now
   - ☐ Not at all

2. I have looked forward with enjoyment to things.
   - ☐ As much as I ever did
   - ☐ Rather less than I used to
   - ☐ Definitely less than I used to
   - ☐ Hardly at all

3. I have blamed myself unnecessarily when things went wrong *
   - ☐ Yes, most of the time
   - ☐ Yes, some of the time
   - ☐ Not very often
   - ☐ No, never

4. I have been anxious or worried for no good reason.
   - ☐ No, not at all
   - ☐ Hardly ever
   - ☐ Yes, sometimes
   - ☐ Yes, very often

5. I have felt scared or panicky for no very good reason *
   - ☐ Yes, quite a lot
   - ☐ Yes, sometimes
   - ☐ No, not much
   - ☐ No, not at all

6. Things have been getting on top of me *
   - ☐ Yes, most of the time I have not been able to cope at all
   - ☐ Yes, sometimes I haven’t been coping as well as usual
   - ☐ No, most of the time I have coped quite well
   - ☐ No, I have been coping as well as ever

7. I have been so unhappy that I have had difficulty sleeping *
   - Yes, most of the time
   - Yes, sometimes
   - Not very often
   - No, not at all

8. I have felt sad or miserable *
   - Yes, most of the time
   - Yes, sometimes
   - Not very often
   - No, not at all

9. I have been so unhappy that I have been crying *
   - Yes, most of the time
   - Yes, quite often
   - Only occasionally
   - No, never

10. The thought of harming myself has occurred to me *
    - Yes, quite often
    - Sometimes
    - Hardly ever
    - Never

The Edinburgh Postnatal Depression Scale

Scoring
Questions 1, 2, & 4 (without an *) Are scored 0, 1, 2 or 3 with top box scored as 0 and the bottom box scored as 3.

Questions 3, 5¬10 (marked with an *) Are reverse scored, with the top box scored as a 3 and the bottom box scored as 0.

Range of scores
Scores

0-9: Scores in this range may indicate the presence of some symptoms of distress that may be short-lived and are less likely to interfere with day to day ability to function at home or at work. However, if these symptoms have persisted more than a week or two further enquiry is warranted.

10-12: Scores within this range indicate presence of symptoms of distress that may be discomforting. Repeat the EDS in 2 weeks' time and continue monitoring progress regularly. If the scores increase to above 12 assess further and consider referral as needed.

13+: Scores above 12 require further assessment and appropriate management as the likelihood of depression is high. Referral to a psychiatrist/psychologist may be necessary.

Item 10: Any woman who scores 1, 2 or 3 on item 10 requires further evaluation before leaving the health facility to ensure her own safety and that of her baby.

Appendix 6: Domestic violence screening tool

Hurt, Insulted, Threatened with Harm and Screamed (HITS) domestic violence screening tool

Please read each of the following activities and place a check mark in the box that best indicates the frequency with which your partner/husband acts in the way depicted.

Date: _____
Age: _____

How often does your partner/husband?	Never	Rarely	Sometimes	Fairly often	Frequently
1. Physically **H**urt you					
2. **I**nsult or talk down to you					
3. **T**hreaten you with harm					
4. **S**cream or curse at you					
	1	2	3	4	5
Total Score:					

- Each item is scored from 1-5.
- Score range is between 4-20.
- A score greater than 10 signifies that a woman is at risk of domestic violence, and should seek counselling or help from a healthcare provider or a domestic violence resource centre.

Appendix 7: Essential drugs for antenatal and postnatal care[5]

Drug	Dosage	Notes
1. Antibiotics		
Amoxicillin	500mg capsules	8 hourly 7 days' treatment = 21 capsules of 500mg/full course
Ampicillin	500mg powder (ampoules) for reconstitution for IV use	Estimate average regimen at: IV dose 1g start then 500mg 6 hourly for 5 days (can move to oral) = 22 doses of 500mg Neonatal dose: 25mg/kg ampicillin or penicillin and gentamycin (age up to 2 weeks: 3mg/kg 12 hourly; age 2 weeks to 12 years: 2mg/kg 8 hourly)
Azithromycin	250mg capsule	1g as a single dose
Benzylpenicillin (penicillin G)	1-g vial of powder for IM or IV use	Benzathine benzylpenicillin powder for injection 1.44g benzylpenicillin (=2.4 million units) in 5ml vial. Often given stat 2.4 million units IM
Cefixime	200mg capsule	400mg/day in 2 divided doses 12 hourly
Cephalosporin (e.g. cefazolin, cefotaxime, ceftriaxone)	Dosage will be 500mg either IV or oral	Estimate average IV regimen at 500mg 8 hourly for 5 days (can then move to oral) = 15 doses/case Estimate similar amount for oral use: 750 doses 500mg cephalosporin for oral use (capsules)
Clindamycin	Tablet 200mg	Two tablet twice daily for 3 days to be taken in combination with oral quinine for the treatment of uncomplicated malaria in the first trimester of pregnancy
Erythromycin	500mg capsules for oral use	Common regimen: 500mg 6 hourly for 7 days = 28 capsules/case
Gentamicin (aminoglycoside)	IV 2ml vial	Common regimen is 80mg 12 hourly IV for 7 days = 14 doses of 80mg/case
Nitrofurantoin	50mg capsule	Use as 100mg 12 hourly for 7 days. Use antenatally for treatment of urinary tract infections

[5] Please note that this table provides information on dosage for commonly used drugs. National guidelines will be followed where available.

2. Antiretrovirals		
Nevirapine	Mother: tablets 200mg Newborn: oral suspension 50mg/5ml	Single 200mg oral tablet at time of labour for mother and for newborn 2mg/kg as single dose in first 72hours (average baby 3.5kg = 7mg = <1ml/case)
Efavirenz + emtricitabine + tenofovir 30mg	Tablet 600mg + 200mg + 300mg	Co-formulated tablets in blister packs. 1 tablet once daily
Lamivudine + nevirapine + zidovudine (AZT)	Tablet 150mg + 200mg + 300mg	Co-formulated tablets in blister packs. 1 tablet twice daily
Lamivudine + nevirapine + stavudine Tablet	Tablet 150mg + 200mg + 30mg	Co-formulated tablets in blister packs. 1 tablet twice daily
Lamivudine + stavudine	Tablet 300mg + 300mg	Co-formulated tablets in blister packs
Lamivudine + zidovudine	Tablet 150mg + 300mg	Co-formulated tablets in blister packs. 1 tablet twice daily
Tenofovir tablet	300mg	1 tablet once daily (used in conjunction with other antiretroviral medicines)
3. Anti-TB		
Isoniazid	Tablet, 100mg	5mg/kg once daily – maximum dose: 300mg/day
Pyrazinamide	Tablet, 400mg	25mg/kg once daily – maximum dose: 2g/day
Rifampicin Tablet	Tablet, 150mg and 300mg	600mg monthly on an empty stomach
Ethambutol	Tablet 100mg and 400mg	15mg/kg once daily – maximum dose: 120mg/day
Kanamycin	1g in vial	Complementary list medicine for treatment of MDR TB
Ofloxacin	Tablet 200mg and 400mg	Complementary list medicine for treatment of MDR TB
4. Respiratory drugs		
Prednisolone	Tablet 5mg	Initial dose: 20-70mg/day Maintenance dose: 5-15mg/day. Single daily dose in the morning with food
Terbutaline inhaler, 100mg	100mcg/metered dose	One inhalation as required. Not more than 4 inhalations should be required in any 24-hour period The duration of action of a single dose is up to 6 hours
Salbutamol Inhaler	100mcg/metered dose per puff	2 to 4 inhalations every 10-30 minutes in symptomatic treatment of asthma attack
Hydrocortisone	Tablet 10mg	60-80mg every 4-6 hours for 24 hours then gradually reduce the dose over several days
Salbutamol Nebulizer	2.5mg, 5mg – solution for inhalation	5mg in 2.5ml to be administered via a nebuliser in severe asthma attack

5. Antiemetics		
Metoclopramide	Tablet 10mg or injection, 5mg/ml in 2ml	15mg-30mg/day in 3 divided doses 6 hourly
Ondansetron	Tablet, 4mg	4mg or 8mg BD
Promethazine	Tablet, 25mg	25-75mg/day in 3 divided doses or once at night
Prochlorperazine	5 to 10mg tablet or IV/IM	Prevention: 5-10mg two or three times a day Treatment: 20mg immediately
Cyclizine	50mg tablet or injection	50mg orally, which may be repeated up to three times a day or 50mg IM or IV up to three times daily
6. Antimalarials		
Quinine	Tablets of 300mg IV Quinine dihydrochloride 300mg/ml = 2ml ampoule	Oral – 600mg 8 hourly for up to 10 days IV – 20mg/kg initially (estimate 1200mg) then 10mg/kg 8 hourly (estimate 600mg) for 48 hours then usually switch to oral
Sulfadoxine pyrimethamine	Tablets of 500mg + 25mg	2 or 3 presumptive treatment doses given during antenatal period where chloroquine resistance is noted or as the preferred national regimen
Artesunate-amodiaquine	Tablets 100mg + 270mg	Co-formulated tablets in blister packs. 2 tablets once daily for 3 days
Artemether Lumetantrine	Tablets 20mg + 120mg	Co-formulated tablets in blister packs. The treatment is administered twice daily for 3 days
7. Antacids		
Magnesium Trisilicate	Tablet, 500mg	1 or 2 tablets to be chewed four times a day
Omeprazole	Capsule, 10mg and 20mg	20mg once a day in the morning for 3 days
Ranitidine	Tablet, 150mg or Injection, 25mg/ml in 2ml	150 BD, or 300mg at bedtime
8. Thyroid medication		
Carbimazole	Tablet 40mg	20-60mg, taken as two to three divided doses. The dose should be titrated against thyroid function
Propylthiouracil	Tablet 50mg	50-150mg once a day
Levothyroxine	Tablet 100mg	100-200mg once a day

9. Antiepileptics		
Lamotrigine	Tablet 100mg	100mg or 400mg each day depending upon severity
Levetiracetam	Tablet 500mg	1,000mg and 3,000mg each day depending on severity
Primidone	100-125mg titrated oral doses	One tablet twice daily
Topiramate	Tablet 200mg	200-400mg in two divided doses
Carbamazepine	Tablet 100mg and 200mg	0.8-1.2g daily in divided doses
10. Antihypertensives		
Labetalol	Labetalol tablets for oral use 100mg Labetalol for injection 5mg/ml 20ml ampoules	Oral 100-200mg 12 hourly tablets 10-20mg IV if hydralazine not available or not effective Maintenance dose 40mg/hour IV for 24 hours
Nifedipine	Sustained-release tablets 5mg or 10mg	5-10mg given orally in pre-eclampsia, may need to repeat Then 20-100mg daily in two divided doses; assume for 30 days maximum
Methyldopa	250mg tablets	Dose 2-3 tablets daily, on average, up to a maximum of 4g/day
11. Anti-diabetic drugs		
Insulin Injection,	40iu/ml in 10ml vial in 10ml or 100iu/ml in 10ml vial	SC/IM/IV according to individual requirements
Metformin	Tablet, 500mg	500mg 3 times a day with food or 850mg BD with or after food
12. Anti-anaemia drugs		
Folic acid	Tablet 1mg or 5mg	Dosage is 1 tablet/day each of ferrous sulphate and folic acid unless in one combined tablet
Ferrous sulphate	Tablet 200mg	Ferrous sulphate minimum need 60mg/day with 450 micrograms folic acid. Ferrous sulphate 200mg tablets contain 65mg elemental iron
13. Antifungals		
Nystatin	Tablets 100,000 units Pessaries 100,000 units	Oral candidosis: 4 times daily for 1 month Vaginal candidosis: 1 pessary at night for up to 2 weeks
Clotrimazole	Pessary	
Fluconazole	Tablet 50mg, 100mg and 200mg	50-200mg once daily for 7-14 days

14. Antidepressants		
Citalopram	Tablet 20mg	20mg once day
Fluxoetine	Tablet 20mg	20mg once day
Sertraline	Tablet 50mg	50mg once a day
15. Antipsychotics		
Haloperidol	Tablet 5mg, 2mg/ml oral solution	2-10mg/day in 2 divided doses. Dose may be gradually increased to 20mg/day if necessary
Olanzapine	Tablet 10-20mg	15mg once a day
Risperidone	Tablet 1mg	2mg in 2 divided doses. May be increased to 6mg/day in 2 divided doses if needed
Clozapine	Tablet 12.5mg	
16. Obstetric emergencies		
Magnesium sulphate	4g magnesium sulphate IV (slowly, over 5-10 minutes)	For seizure (fit) in eclampsia: Initially: 4g magnesium sulphate IV (slowly, over 5-10 minutes) Followed by: 1g/hour for minimum of 24 hours, using syringe driver. If syringe driver pump not available, follow-up dose also given as 5g IM every 4 hours for at least 24 hours after last seizure
Calcium Gluconate	1g IV	1g Iv slowly followed by 4g daily by continuous infusion
Diazepam	Tablet, 5mg 5mg/ml in 2ml ampoule	10mg IV slowly, if necessary repeat. Diazepam may also be useful in cases of neonatal convulsions
Hydralazine	Powder for reconstitution for injection 20mg ampoules, IV or IM	Stat dose 5-10mg IV repeat if necessary (maximum 20mg) Maintenance dose:
17. Anticoagulants		
Heparin (Low molecular weight)	Injection, 1000iu/ml or 5000iu/ml	Prophylaxis: 5000 IU every 12 hours Treatment: SC 15,000 IU 12 hourly. Daily lab monitoring is essential and dose adjusted accordingly
Warfarin	Tablets 1,2 and 3mg	Baseline prothrombin time (INR) should be determined before initial dose and checked regularly. Usual dose 3-9mg daily

18. Analgesics		
Paracetamol	Tablets 500mg	1g 4-6 hourly, no more than 4g in a 24hr period. Use as analgesic antenatally and postnatally and with fever, e.g. in sepsis, malaria
Ibuprofen	Tablets 200mg	1.2-1.8g daily in 3-4 divided doses
Pethidine	50mg/ml 1-ml ampoules for injection	50-100mg IM injection 3 hourly up to 400mg/24 hours
Morphine	10mg IM/IV	IM/IV 10-20mg given 4-6 hourly up to 150mg/24 hours
19. Corticosteroids		
Dexamethasone, Betamethasone	Dexamethasone and betamethasone 1ml ampoules of 4mg/1ml for injection	Betamethasone 12mg IM 2 doses 24 hours apart OR Dexamethasone 6mg IM 4 doses 12 hours apart. A single course of antenatal corticosteroids should be considered routine for preterm delivery If gestational age less than 34 weeks
20. Other drugs		
Vitamin A	Tablets 200,000 units	In antenatal period, up to 10,000 units can be given daily in areas with vitamin A deficiency. Postnatal recommendation of 200,000 units once in some countries
Aciclovir	Tablet 200mg	400mg 3 times per day for 7 days
Mebendazole	Tablet 500mg	Once off dose during pregnancy. Dose also given as 100mg twice daily for 3 days. Not routinely recommended
21. Neonatal drugs		
Vitamin K	Phytomenadione (vitamin K1) (Konakion® MM paediatric, Roche) 10mg/ml in 0.2ml ampoules	0.1ml IM at or shortly after birth. 1mg may be given by IM and this prevents vitamin K deficiency bleeding in virtually all babies
Tetracycline	Tetracycline hydrochloride 1% eye ointment	At birth, 1 application of ointment to each eye. Generic amount

Appendix 8: List of reviewers

The content of this manual has been reviewed by many people from different disciplines and countries.

The content was first reviewed as part of a multi-country workshop with 46 participants from ten countries. In addition, colleagues from Ghana, Togo and Afghanistan have provided invaluable inputs, feedback and amendments during in-country demonstration workshops.

Our sincere thanks to all!

The Centre for Maternal and Newborn Health would also like to thank the following individuals for reviewing sections of the manual;

Dr Helen Allott, Senior Technical Officer, Centre for Maternal and Newborn health, Liverpool School of Tropical medicine, Liverpool, UK
Ms Lucie Baylis, Midwife, Royal Cornwall Hospital, UK
Dr Luc de Bernis, Consultant Obstetrician/Gynaecologist, France
Ms Beatrice Chisenga, Midwife, Royal Bolton Hospital, UK
Ms Elizabeth Ekanem, Midwife, Princess Alexandra Hospital, UK
Dr William Forson, Consultant Obstetrician/Gynaecologist, Dumfries and Galloway Hospital, UK
Ms Susan Ginn, Midwife, Norfolk and Norwich University Hospital Trust, UK
Dr Pamela Godia, Senior Technical Officer, Liverpool School of Tropical Medicine, Kenya
Ms Ruth Holland, Midwife, Southmead Maternity Unit, North Bristol Hospital, UK
Ms Bupe Khalison, Senior Technical Officer, Liverpool School of Tropical Medicine, Tanzania
Dr Eugene Kongnyuy, Deputy Representative, UNFPA, Nigeria
Dr Elizabeth Ledger, Paediatrician, Médecins Sans Frontières, The Gambia
Ms Kirsty Lowe, Midwife, St Mary's Hospital, UK
Dr Franz Majoko, Consultant Obstetrician/Gynaecologist, Singleton Hospital, UK
Dr Alexander Manu, Senior Clinical Research Associate, Centre for Maternal and Newborn Health, Liverpool School of Tropical Medicine, UK
Ms Judith Maua, Senior Technical Officer, Liverpool School of Tropical Medicine, Kenya
Dr Paul Mensah, Consultant Obstetrician/Gynaecologist, Dumfries and Galloway NHS Board, UK
Dr Hauwa Mohamed, Senior Technical Officer, Liverpool School of Tropical Medicine, Nigeria
Ms Joyce Mutuku, Senior Technical Officer, Liverpool School of Tropical Medicine, Kenya
Dr Helen Nabwera, Senior Clinical Research Associate, Centre for Maternal and Newborn Health, Liverpool School of Tropical Medicine, UK
Ms Alison Perry, Alison Perry, Midwife, Imperial College, UK
Prof Shamsa Rizwan, Child Advocacy International, Pakistan
Ms Betty Sam, Senior Technical Officer, Liverpool School of Tropical Medicine, Sierra Leone
Dr Miss Gillian Scothern, Consultant Obstetrician/Gynaecologist, Derby Hospital, UK
Dr Adama Traore, Senior Technical Officer, Centre for Maternal and Newborn Health, Liverpool School of Tropical Medicine, UK
Dr Shaheen Uqaili, Obstetrician/Gynaecologist, Singleton Hospital, UK
Dr John Williams, Consultant Obstetrician/Gynaecologist, Countess of Chester Royal Hospital, UK