Emergency Obstetric Care and Newborn Care Training for Skilled Health Personnel

A Manual for Facilitators

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Welcome to the Emergency Obstetric and Neonatal life-saving skills course

Despite some improvements in recent years, global maternal mortality and morbidity remains too high. In 2017, global estimates of maternal death annually stood at 295,000 (WHO 2019), with a global maternal mortality ratio (MMR) of 211 maternal deaths per 100,000 live births. Twenty countries had an MMR of greater than 500/100,000 live births. Of these, all but Afghanistan are located in sub-Saharan Africa. Three countries had an MMR greater than 1000, South Sudan, Chad and Sierra Leone. For each woman who died, there were many more who suffered serious morbidity.

There are many reasons for this loss of life. For example, the Kenyan Confidential Enquiry into Maternal Death 2017 revealed that in 9 out of 10 reported cases of maternal death, women received substandard care and commented that, had the care been different, the deaths could have been averted. In a significant proportion of these deaths, inadequate clinical skills were cited as reasons for substandard care.

To achieve the Sustainable Development Goal 3 global maternal mortality ratio of less than 70 maternal deaths per 100, 000 live births, we have to scale up evidence-based interventions that improve access to and utilization of quality maternal health services. Competent skilled health personnel who can provide Emergency Obstetric Care and Newborn Care working within enabling environments are required.

It is therefore of great importance that all skilled health personnel receive adequate training in the early detection and management of obstetric emergencies.

This short course aims to provide basic training in obstetric emergency and newborn care skills, applying a structured approach to the management of all obstetric and newborn emergencies. This manual is not intended as a comprehensive textbook, but rather may be used as a "quick look book" to remind you of the skills taught on this course.

This manual can be used on our in person or blended learning training course.

We appreciate all authors of previous editions and all those who contributed to the development of this third edition.

Charles Ameh March 2021

MODULE 1: BEING A GOOD FACILITATOR

1.1 Introduction

Being a facilitator is about making sure that those you are teaching learn what is intended. It can be demanding, intensive but a rewarding experience! Adequate preparation to deliver sessions, participation in the pre-travel telecall and first meeting to prepare for the training are essential parts of the role of a facilitator.
For the participants of these courses, you are seen as a professional and clinical role model. Many participants will never have been to a 'hands-on skills and drills' course such as this one and may be unfamiliar with this type of teaching. Training different cadre of health care workers may be unusual in that setting, so proactively facilitate interaction based on a team approach to managing obstetric and newborn emergencies.

Try to keep to the allocated time for the session. Pay attention to how the learners rotate around the stations; sit in other facilitators' lectures as much as possible. You cannot sit through all the lectures, however, as you need time to set up for your own breakout stations.

Just as the learners, you too require support, and this will come from more experienced course facilitators. The course faculty is led by a **Course Director**. He or she will have been appointed by the technical team with oversight of the training. Similarly, a **Course Assessor** will help with the assessment of the participants. Twice-daily faculty meetings are held to ensure the smooth running of the course and to offer you support.

Safety

You have a responsibility for the safety of the learners. Do not teach any mouth-to-mouth techniques and be very careful with sharps. Watch out that the participants take the usual precautions when using sharps – this in itself is part of the learning exercise.

To be able to teach effectively you need to understand something of the principles of adult learning.

- Adults are generally in a learning situation because they want to be. Children are in a learning situation because they have to be. This is a good start, but it means that if adults do not want to be in the learning situation they will not participate.

Therefore:

- Adults must enjoy what they are doing: they will not enjoy threats, humiliation and fear
- Adults must understand what they are doing
- Adults must see a reason for what they are doing, and their reasons are very varied
- 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
- Adults learn in many ways; therefore, different methods of teaching must be used, including:

  - ☐ listening
  - ☐ talking
  - ☐ watching
  - ☐ doing
  - ☐ reading
  - ☐ interacting

It is interesting to consider through which methods you personally find it easiest to learn.

How to teach

Any teaching activity should have a defined beginning (sometimes known as a 'set'), a middle and a defined end (sometimes known as 'closure').

The beginning (set) is about emphasising the importance of the piece of teaching and stating which important points will be covered, explaining how this will be done and setting the mood. The end is about emphasising the main points that have been covered.

This model applies to all teaching methods such as lectures, scenarios, skills, workshops and demonstrations.

Giving a lecture

The EOC&NC course has a set of generic lectures. All lectures are part of the course 'package'. You do not have to write the lecture: it is already written, but you do have to practise it. A guide is that the practice time should be ten times the length of the lecture, so spend about two and a half hours practising a 15-minute lecture. You must be very familiar with the lecture and also very familiar with the subject, as you might get asked questions about things which have not been covered in the lecture. To be familiar with the subject you must know that particular part of the main Course Manual as well as this Facilitators' Manual.

Check that your lecture is loaded on to the laptop and that it runs and projects. Shortly before you give your lecture, go through the slides on the screen to which they are projected to check that they look ok. Make sure that you know how to move slides forward. Make sure that you know where your lecture is on the laptop and that you are able to get it up on the screen quickly in presentation form once you go up to lecture. If this worries you, ask another facilitator to do this. They will be more than happy to and it takes away a worry from you.

- Begin by greeting the audience, as this is very important in most cultures. After this, quickly introduce yourself, your name, where you are from and what is your job. Then start with the beginning (the 'set'). This is covered on a summary slide at the beginning of every lecture. If necessary, add to this the arrangements for questions such as 'I will take questions at the end' and set the mood.
- Do not just read from the slides. Know them well, paraphrase and say in a natural way what the message on the slides is. You can add in comments or examples if you have time, although this will mostly be covered in the breakout stations.
- Stand to the right of the screen and halfway between the screen and the audience, making sure that you can reach the laptop to change the slides.
- Place the laptop so that you can see the laptop screen whilst you are facing the audience. Do not keep turning to the large screen behind you unless you are using a pointer to show a particular point or image to the audience. As soon as you turn your back on the audience you disengage yourself from them and if you are not facing them, they will lose interest. They will not hear you well if you are not facing them.
- Hold your head up and throw your voice, as if you are talking to somebody at the back of the room.

- Do not pace about as this can be very distracting for the audience
- Please note that, for many people attending these courses, English is **not** their first language. Speak clearly, avoid colloquial language, slang, jokes, and so on. Use simple English.
- You can put out questions to all participants or to individuals. Be careful not to 'humiliate' participants. Be sensitive to cultural practice and be aware that some healthcare providers will have many years of experience (although practice may be different from that to which you are used). When the answer comes, repeat it so that everyone in the audience hears the answer.
- When you take questions, make sure that the audience has heard the question and, if necessary, repeat it.
- If a question is not easily answered, you can ask for the help of the facilitators or ask if anyone has any ideas or relevant experience. If the question develops into a discussion, keep the discussion brief by saying that there is time to elaborate in the breakout stations and during break times.

Breakout stations

The breakout stations take the form of skills practice, scenarios, workshops, discussions, demonstrations, and DVDs.

This guide contains detailed instructions on how to run the breakout stations in which you are involved. You will be allocated your breakout stations by the course director well ahead of the course and this will be on the facilitators' programme. You will usually work together with an experienced member of the faculty. This manual contains lists of equipment required for each station. It is your responsibility, before the station begins, to make sure that all the equipment is in the room and laid out where your breakout station will be held. Make sure that you know where the equipment is kept – discuss with the course director if necessary. It is also your responsibility to leave the room in a tidy and safe state at the end of the breakout station. Before you start, make sure that you have the right candidate group in the room (as indicated on the programme).
Welcome the group and tell them clearly what the learning objectives are for the session

Note that, in many cultures and settings, it is not customary to pick on one person to be a 'main performer'. Therefore, try as much as possible to involve more participants from the group; for instance, one can play the doctor, one the midwife, one the patient's relative, and so on. In many cases, participants will be from different levels (types) of health facility (such as primary, secondary, tertiary hospitals) and of different cadres (nurse, midwife, clinical officer, medical assistant, doctor, specialist doctor). It is very important to encourage good communications and teamwork. Try to make sure that the participants are taking turns. In some groups, it may be appropriate to ask one person to be the 'main performer'.

You will be given 5-minute warnings and then told when time is up. Once time is up, stop the station immediately and send the group to their next station. There will be facilitator feedback forms in every room for you to write down comments on how the station you have given might be improved. It is important to use the closing moments to summarise the main learning points from the session. Say "In this session, we have learned that…"

Teaching a scenario

A scenario is a method of teaching which aims to be as near to real life as possible. One of the facilitators acts as the patient. The other facilitator presents the clinical situation (written in the breakout document) and asks the candidate to repeat back and then show what they would do. The breakout document advises how to progress through the scenario. Make the 'set' (beginning) by introducing yourself, saying what this station is about and describing how it will be run. At the end, ask if there are any questions and then make the 'closure' by describing the main points which have been covered.

Teaching a skill

A good method for teaching a skill is to use the 'four parts' process. This involves:

- Demonstrating the skill
- Demonstrating and describing the skill
- Demonstrating the skill and asking one of the participants to describe it
- Getting each learner to actually do it and describe what they are doing.
- In practice, there is often not enough time for this, and the process is abbreviated to a two-part process where the skill is described and demonstrated by the facilitator simultaneously then the participant describes and demonstrates simultaneously.

Make the 'set' by introducing yourself and then say how the station will be run. It is suggested that the first three steps are done with the learner group all looking on. The more full sets of equipment at the station the better, as more than one learner, can carry out the 'doing and describing' step at the same time. Ask if there are any questions and then make the 'closure' by emphasising the main points. If there is insufficient time or there is someone in particular who has not had sufficient time, you can suggest that learners come back to the station at the break times.

Teaching a workshop

As with any teaching station, make the 'set' by introducing yourself and saying how the station will run. There are instructions in the breakout station on how specifically to run the workshop. Ask if there are any questions and make the closure by emphasising the main points.

Leading a discussion

There are two sorts of discussion: open and closed. An open discussion is where comments are made from individual to individual without going through the discussion leader. A closed discussion is one where the leader is at the centre of the discussion and comments are all passed through the leader. A closed discussion allows the leader to control the direction and content of the discussion. It is recommended for more junior (or new) learners.

The demonstration

There is a demonstration on the first day of the course. You will be told well ahead of the course if you are to be a player in the demonstration and there is a script for this (Appendix 2).

Mentoring

The mentoring system is an extremely valuable part of the learner's experience of the course. It helps them to learn and achieve on the course and makes them feel comfortable and valued. There is mentoring time specifically planned during the course and you are asked to meet with your mentees and ask how they are getting on. It is useful to check whether there are any problems and whether they need any more help or support of any sort. It is also very useful to receive feedback on the course from the mentees. You can feedback your mentees' views at a faculty meeting or, if you think that the matters they raise are of a more confidential nature, you can discuss these with the course director.

Feedback

Although this course is not a pass/fail course, feedback can be useful. It must be given sensitively. A useful method is to ask the participant how they think that they performed, encouraging them to highlight the positives and then consider points for improvement. If the facilitator chooses not to ask the participant but just give feedback directly, he or she should also give positive points first and then points for improvement.

MODULE 2: QUALITY OF CARE FOR MOTHER AND BABY

2.1: The quality of care

Key learning objectives

- Quality of care
- Respectful maternity care
- The rights-based approach to health
- Communication skills
- How and when to obtain informed consent
- The importance of male involvement and companionship

Internationally, there has been much progress made concerning increasing the coverage of maternal and newborn health interventions over the past two decades. However, further improvement in maternal and newborn health outcomes will depend on the ability of healthcare leaders and providers to address the gap between availability and quality of care. Improving the quality of facility-based healthcare services and prioritising quality improvement as an integral component of scaling-up of effective, evidence-based interventions is crucial if health outcomes for women and babies are to improve.

There are many definitions of quality of care, all of which are important for antenatal, intrapartum and postnatal care.

Definitions of quality of care

- Quality of care is defined as the extent to which health services provided to individuals and populations improve desired health outcomes. To achieve this, health care needs to be safe, effective, timely, efficient, equitable, and people-centred.
- Quality of care is the degree to which maternal health services increase the likelihood of timely and appropriate treatment to achieve desired outcomes that are both consistent with current professional knowledge and uphold basic reproductive rights.
- The quality of medical care is an index of civilisation.

Multi-disciplinary teamwork with midwives, nurses and doctors is essential to provide good quality evidence-based care. Sometimes, healthcare providers may provide care that is not proven to be effective (i.e. non-evidence-based) simply because “that is the way it has always been done”. Therefore, all healthcare providers must be knowledgeable and keep up-to-date regarding which aspects of care are evidence-

based and beneficial and, conversely, which aspects of care are detrimental and for which there is no evidence of benefit to either the woman or her baby.

Components of good quality care

- Care is provided in line with currently available evidence (evidence-based care)
- Care that is supportive, responsive and sensitive to the values and context of each woman's culture.
- Each woman is welcomed and called by her name.
- Special attention is given to each woman's specific needs and wishes.
- Each woman's physical, social and mental health needs are taken into account.
- Each woman is treated with compassion, kindness, and patience.
- Women are given information in plain language and play an active role in the decision-making process for the care they receive. Privacy and confidentiality are maintained at all times.
- Women are allowed to ask questions and to have their concerns addressed.
- The woman's partner of choice is consulted, involved and informed of decisions, interventions and needs as they arise, with the woman's permission.
- A mother and her newborn are enabled to remain together from birth and throughout their stay in or visit to a healthcare facility.

2.2: Respectful maternity care

Respectful maternity care is an essential part of quality improvement. This includes woman-centred care, empowering, supportive, evidence-based, enabling open communication and full expression of trust and commitment between a woman and her healthcare provider. Respectful maternity care highlights that women have a right to receive the highest quality of care possible, in a way that addresses their physical, psychological and social needs. Treating women with dignity and respect means that the healthcare provider has a caring attitude, listens to women, respects their wishes and demonstrates empathy.

- **Respect:** This can be a certain feeling or holding someone in high regard, having respect for someone's knowledge, their judgement or hard work. The healthcare provider can show respect by introducing her/himself by name and greeting the woman by her name.
- **Empathy:** Showing empathy for someone means understanding their situation, thinking about how you would feel if you were in a similar situation and being able to share their feelings. The healthcare provider can show empathy by active listening to understand a woman's specific health concerns. Having sympathy is slightly different and involves showing compassion or sorrow for someone's problem or hardship.

- **Dignity:** Showing dignity means that a woman is valued and care is given in a way that supports and promotes and does not undermine, a woman's self-respect regardless of any difference. The healthcare provider can demonstrate dignity by ensuring privacy and confidentiality at all times.

To provide respectful maternity care, healthcare providers need to have the right attitude, beliefs and values. An attitude is how we evaluate a person, place, thing or event, and maybe favourable or unfavourable. A belief is a thought that we hold deeply and trust and, because of this, this can cause automatic reactions in us. People do not often question beliefs as they hold them to be true. Attitudes and values are shaped by our beliefs and we may not always be aware of these unless we stop to think about them. Everyone has a right to their own beliefs but when caring for women, healthcare providers may have to explore and understand how these affect the care they give (both positively and negatively).

These are reasons that may explain why disrespect and abuse during antenatal and postnatal care occurs and a review of these may help healthcare providers work out ways to resolve the issues. Sometimes there are factors in the health system itself or in the community that act as barriers to being able to provide good quality care. Healthcare providers and managers can usually influence these factors to help facilitate improvement and overcome these barriers.

2.3: The rights-based approach to reproductive health

The definition of reproductive health highlights the importance of a rights-based approach to health care. Reproductive health is the complete physical, mental and social well-being in all things related to the reproductive system, including a satisfying sex life, the ability to have children and freedom to decide if when and how often to have children.

Reproductive rights include the right to:

- Decide how many children they want and the spacing of their children
- Have an education about and the means to choose the contraception method of their choice
- Have the highest possible standards of reproductive health
- Access to a skilled birth attendant
- Make decisions about reproduction free from discrimination, coercion and violence

Table 2.1 Barriers and enabling factors for delivery of respectful maternity care

	Barriers	Enabling factors
Health system factors	Inadequate infrastructure	The reorganisation of available space, raise funds for seating
	Shortage of equipment and supplies	Regularly check stock and report any shortages to management regularly and early
	Poor supervision and management of healthcare facilities	Start a system of peer support
	Poor resource management of existing staff	Make a clear rota and schedule for clinics
	Inadequate communication linkages between healthcare facility managers, providers and community members	Organise quality of care meetings
Community-level factors	Gender imbalances in communities where the man is the sole decision maker	Ensure discussions with both female and male community leaders
	Lack of knowledge about the importance of maternity care	Community education
	Financial barriers including the need to pay for transport to access care	Mobilise community resources
	Limited opportunities for communities to seek redress if women are unhappy with services received	Encourage the community and women to give feedback about the quality of care they have received, both positive or negative experiences
	Traditional beliefs, practices, customs and taboos making it difficult to discuss issues around childbirth	Respect tradition and deliver care in culturally appropriate ways

Not treating a woman with respect and dignity when providing health care is a violation of their rights as a human being. Examples of abuse of human rights in maternal health are:

- **Physical abuse**: a woman is slapped during childbirth by the healthcare provider.
- **Non-consensual care**: care is provided without the woman's permission and/or agreement, for example performing a routine episiotomy, especially without analgesia.
- **Non-confidential care**: test results for a woman are shared with others without her permission.
- **Discrimination**: illiterate women are not treated with the same regard as educated women.
- **Abandonment or withholding of care**: a woman who needs care is not given this care by the healthcare provider for example analgesia is not offered during and after childbirth.

Table 2.2: The rights-based approach to reproductive health

	Examples of rights	Example of disrespect and abuse	Example of how rights can be met
1	Freedom from harm and ill treatment	Physical or verbal abuse	Ensure a policy of no physical or verbal abuse is implemented
2	Right to information, informed consent and refusal of care	Non-consensual care	A clear explanation is given to women about the care they need and why. They are not penalised if they refuse the care offered to them
3	Respect for choices and preferences for care, including having a companion during maternity care	No companion allowed in the examination room during antenatal or postnatal care	Healthcare providers allow the companion of the woman's choice to be with the woman at all times
4	Confidentiality, privacy	Non-confidential care	Healthcare provider speaks with the woman on her own when needed
5	Equality, equitable care, freedom from discrimination	Discrimination based upon specific characteristics of the woman	All women are treated the same
6	Right to timely health care and to the highest standard of care available	Abandonment or denial of care or poor quality of care	Good organisation of antenatal and postnatal care to reduce waiting time. Evidence-based, timely care is provided safely
7	Liberty, autonomy, self-determination and freedom from coercion	Detention in a healthcare facility against a woman's wishes	Explanations are given regularly as to why a woman needs to stay in a healthcare facility. Process for self-discharge against medical advice in place

2.4: Communication Skills

Good communication skills, both verbal and non-verbal, are essential for all healthcare providers. Any interaction between healthcare providers and a woman and her family is an opportunity to build rapport and demonstrate respectful care. The experience of the visit and consultation is likely to affect how the women and her family perceive the care they receive and this will influence their decision to continue coming to the healthcare facility.

Effective communication includes:

- Having the ability to listen to the woman and her family
- Being able to explain what the care is, what investigations are being offered and the meaning of the results of the test in words that the woman will understand
- Using the local language that a woman understands, an interpreter may be needed
- Demonstrating empathy for the women and her family

- Being non-judgemental

Ways to improve communication:

- Allow some time for introductions explaining who you are and what you plan to do
- Sit at the same level as the woman when you are talking with her when taking a history
- Sit beside a woman rather than behind a table or desk during a consultation
- Use language that is not medicalised and can be understood by the woman and her family
- Provide a private space for the discussion to happen whenever possible

2.5: Informed consent

Giving consent in maternal health for treatment is based upon the principle that a woman must give their permission before medical treatment, a test, a medical procedure or an examination is carried out. Consent can only be given after a clear explanation is given by a healthcare provider and understood by the woman.

Consent needs to be:

- **Voluntary**: The decision must be made by a woman without influence or coercion from healthcare providers, friends or family.
- **Informed**: A woman must be given correct information about what the treatment or examination involves, including the benefits and risks, reasonable alternatives and what will happen if the treatment or examination goes ahead, all in plain language.

In principle, a woman must be capable of giving consent, which means they can understand the information that has been given to them and can use it to make an informed choice. Consent can be verbal, such as when taking a blood sample or written such as required in the case of a Caesarean section.

Different forms of consent

- **Lack of consent**: Obtaining voluntary and informed consent can be difficult if a woman has an impaired state of mind or is unconscious, such as after an eclamptic fit. In such cases, the partner or family member can be asked to provide consent for treatment.
- **Refusal of care**: Even if refusing treatment might cause harm or death, a woman's decision should be respected within the laws of the country. This can be very difficult, for example, when a woman with a very low haemoglobin level refuses a blood transfusion for religious reasons. In these cases, a woman can be asked to sign a form or statement which declares that she understands the risks of going against medical advice and still wishes to decline treatment, accepting responsibility for

any risks to her health. If a woman is pregnant and a refusal of care (e.g. the need for a Caesarean section) will result in harm to the unborn baby then a legal judgement may have to be made for the treatment to go ahead.

- **Age**: In the case of a woman who is under the legal age of consent then she may still be able to give consent if she can demonstrate to the healthcare provider that she fully understands what she is consenting to. If this is not the case, then parents or guardians may have to give consent. Laws regarding consent vary from country to country. In most countries, the age of consent is either 16 or 18 years of age.

In practical terms, it may not be possible to obtain written consent in emergencies, for example, a massive obstetric haemorrhage and in these cases, a healthcare provider can proceed with verbal consent before treatment.

2.6: Male involvement and companionship

In some settings, pregnancy is considered a subject/topic for women and men may not be equipped with sufficient information and knowledge on specific aspects of maternal and newborn health. There is, therefore, a need to empower men through the provision of information and services in their homes, communities and their workplaces. It is important to involve the woman's husband or partner and family whenever possible so that they are well informed about the care that the woman needs. This will enable them to anticipate any problems and support the woman during and after pregnancy and childbirth.

Advantages of involving the husband/partner and family include:

- Increased information regarding the pregnancy, childbirth and postnatal processes
- Increased awareness of possible danger signs during the pregnancy
- Development of a birth plan including the availability of finances and planning for transport to the healthcare facility
- Increased understanding of the specific needs of the mother and baby when returning to the family home
- Increase in the general community and public awareness of issues around maternal and newborn care

Support from a husband, partner, another family member or friend is important during pregnancy, labour, birth and the postpartum period. Women can be encouraged to bring their husband or partner during antenatal care, delivery and postnatal care as the husband or partner must understand the woman's health. Men are more supportive of their wives and partners

when they understand what is happening during and after pregnancy. Male involvement and participation is associated with improved maternal health outcomes.

In the absence of a husband or partner and/or if this considered culturally more appropriate, women can be encouraged to bring a family member or friend with them. A companion can provide important support to a woman. Companionship during labour leads to a better birth experience for the woman.

MODULE 3: COMMUNICATION, TRIAGE AND REFERRAL

Key learning objectives

- Why effective communication skills are important.
- The process and components of effective communication in case of an emergency.
- The components of the ACCEPT approach which can be used when referring a patient.

3.1: Communication

It is important that:

1. Women and their families are treated with respect and dignity
2. The care provided is based on the best available evidence (evidence-based care)
3. Healthcare providers are committed to providing the best quality of care possible

Effective communication

Communication is a process that involves transmitting and receiving information between two or more persons. The communication process includes: a sender, a message and a receiver. Effective communication implies that the receiver has heard and understands the message of the sender. In a healthcare setting, effective communication between healthcare providers and between healthcare providers and those receiving care is essential. In an emergency, it is particularly important that communication is clear and unambiguous. Messages may be conveyed face to face or via telephone. It is generally more difficult to convey messages clearly over the telephone than face to face and it is therefore useful to plan what to say and perhaps write this down when using a telephone.

Privacy and confidentiality

In all contacts with the woman and her family:

- Ensure a private place for the consultation and examination.
- When discussing sensitive subjects, make sure that you cannot be overheard.
- Organise the examination area so that, during examination, the woman is protected from the view of other people (use curtains, screens, etc).
- Never discuss confidential information about patients outside the healthcare facility.
- Remember all patient information is confidential and records should be correctly stored.

What do you communicate?

When communicating with a colleague in an emergency, key elements of what you communicate should include:

Who you are

What you want the listener to know

What the relevant patient details are
What the problem is
What has been done to address the problem so far
Why you need help and what you think needs to happen next

The SBAR Framework (Table 2.1) may be used to help organise the information you want to communicate.

Table 3.1 The SBAR framework

Situation	**Identify yourself** **Your unit** **The patient's name** **Your reason for calling or communicating face-to-face (what is bothering you about the patient)**
Background	Reason for admission Relevant obstetric and medical history Treatment to date
Assessment	Your current assessment of the woman – including vital signs pulse, blood pressure, temperature, bleeding, etc.
Recommendation	State why you need help Explain what you think needs to happen Ask for advice; are there recommended actions to be taken? Agree time scale Record time, name and contact for further advice or referral if needed

Why do you communicate?

- Effective communication is important:
- To provide accurate information about the condition of the patient (mother and/or baby)
- To identify clearly what the problems are
- To provide details of any planned interventions and expected or possible outcomes
- Helps patients to make decisions and give consent for an intervention
- Helps families understand what the problem is and why investigations and treatment are needed
- Lessens distress and vulnerability
- Leads to greater job satisfaction for the healthcare provider

How do you communicate?

In case of an obstetric emergency (mother and/or baby), this often occurs unexpectedly. Many obstetric emergencies are potentially life-threatening to either the mother or the baby or to both. Therefore, the healthcare provider needs to remain calm and needs to have a clear understanding of what the problem is, what needs to be done, and, needs to be able

to communicate this. It is important to act quickly and precisely. You will need to communicate effectively to colleagues as well as explain to the patient and her family what is happening and what you are going to do. Try to remember the seven 'C's of effective communication.

Table 3.2: The seven 'C's of effective communication

■ Clear ■ Concise ■ Concrete ■ Correct	■ Coherent ■ Complete ■ Courteous

3.2: Triage and prioritisation of care

Triage means to 'sift as through a sieve' or in other words to **prioritise**.
As part of the triage process;

Assess: Provide a quick but thorough assessment of a woman and/or her baby. This usually means you need to take a history, conduct an examination and investigation.

Prioritise: Prioritise who requires what type of treatment when.
The table below outlines the steps and tasks the healthcare provider who first attends to the woman and/or baby should take:

Table 3.3: Steps and tasks during triage and prioritisation

Ask	Examine	Check	Prioritise
MOTHER			
- Why did you come? - Who came with you? - What are the problems?	- Breathing? - Conscious? - Convulsing? - Bleeding? - In pain?	- Patient records - Breathing - Pallor - Pulse - BP - Temperature - Fetal heart rate	- Emergency - In labour – no complications - In labour – high risk of complica-tions - Not in labour
NEWBORN BABY			
- Why did you bring the baby? - How old is the baby? - What are the problems?	- Any sign of life? - Breathing? - Bleeding from umbilical stump? - Breast feeding?	- Birth record - Breathing - Colour - Heart rate - Temperature - Weight - Umbilical cord	- Emergency - Routine care

For the mother

Suspect labour if:

- Abdominal pains and contractions ≥1/10 minutes
- Passage of bloody mucus from vagina
- Drainage of liquor from vagina

Immediate actions to take:

- Transfer to labour ward or labour room
- Call for immediate assessment

Suspect an emergency if:

- Unable to talk or respond to questions
- History of convulsions
- Ongoing convulsion
- Breathing with difficulty
- Bleeding from the vagina
- Foul smelling liquor or discharge
- Severe abdominal pain
- Headache and visual disturbances
- Vomiting
- Fever
- Fetal heart rate <120 or >160 beats per minute
- Rupture of membranes pre-term
- Fresh meconium in liquor

Immediate actions to take:

- Get help
- Ensure RAPID and top-to-toe assessment
- Commence management as needed e.g. insert iv cannula, start fluids, start treatment
- Pay attention to comfort and safety of the woman and her baby
- Explain to the woman what is happening and reassure her that she will be taken care of immediately
- Ask relatives to stay
- Do not leave the woman unattended and/or where she cannot be observed

For the newborn baby

Suspect an emergency if:

- Baby has problems breathing
- Umbilical cord oozing blood or foul-smelling discharge
- Change in colour of skin or mucosa (pale, blue or yellow)
- Vomiting and passing watery stools excessively
- Signs of dehydration
- Not feeding and crying excessively
- Mother reports baby has had convulsions or baby having convulsions
- Fever

Immediate actions to take:

- Get help
- Ensure RAPID and top-to-toe assessment
- Commence management as needed e.g. insert iv cannula start fluids, start treatment

Routine care can be provided for

- Mothers who have delivered a live baby and are not in any apparent danger with stable vital signs (pulse, BP, temperature, breathing)
- Mothers in labour who are not in any apparent danger with regular contractions and normal fetal heart rate 120-160 beats per minute.
- Newborn babies who are well and have no 'danger signs' with stable vital signs (pulse, temperature, breathing)

Action

- If the woman is pregnant and not in labour, provide antenatal care and arrange for follow-up antenatal care visit.
- If the woman had recently delivered, provide immediate postnatal care for the mother and arrange for follow-up postnatal care visit.

Prioritise treatment

Prioritisation of who gets what care, when, and, in what order, is important. This is done regularly in a labour ward with many patients, or, if you are the only healthcare provider caring for many patients and you have to decide who to care for first.

The aim is to do the **'most for the most'** and do this **'in the right order'**. There are generally three categories of patients that may present as an emergency.

Examples of priority are provided below:

Priority 1: A woman or a baby who requires emergency resuscitation and treatment soon or she may die.

Examples:

A woman bleeding excessively and in hypovolaemic shock

A woman with convulsions

A baby who has just been born with no apparent signs of life.

Priority 2: A woman or baby whose care may be delayed for a few hours without significant risk.

Examples:

A woman with rupture of membranes – no prolapsed cord

A baby who is low birth weight, feeding well, and, has a normal temperature.

Priority 3: A woman or baby who can sustain a significant delay

Examples:

A woman with a breech presentation who is not in labour and where the fetal heart rate is normal.

A baby born healthy and resting with the mother but who needs checks before discharge home.

[!] The management of care in the labour ward is a dynamic process and regular re-assessment and prioritisation is vital.

3.3: Referral

This is the act of referring a patient (mother or baby) for consultation, review, or further action to another healthcare provider and/or another healthcare facility.

The **right** patient must be taken at the **right** time by the **right** people to the **right** place using the **right** form of transport and receiving the **right** type of care before transfer and throughout the time of transfer.

A good referral is well planned and prepared. This can be done by following the **ACCEPT** approach:

Table 3.4: The ACCEPT approach

A	**Assess**
C	**Control**
C	**Communicate**
E	**Evaluate**
P	**Prepare**
T	**Transport**

A: Assess

Assess the situation thoroughly but quickly; what is the woman and/or baby's condition? What can be done immediately? Why is a referral needed? Where do they need to be referred to?

Assess availability of services and/or staff required in the healthcare facility you are referring to. Make a phone call where/ when possible.

Assess the transport alternatives; what is available? Who can help? Liaise with volunteers in the community if no ambulance available at the healthcare facility.

The need to accompany the woman and/or the baby. Sometimes the person who has given care to the woman until the time of referral will also accompany her during the referral but often it is someone else who takes over the care during transfer. They may not have any prior knowledge of the woman's condition so need to be fully briefed. If the woman or baby

is very ill and cannot be stabilised during transfer or may be at risk of giving birth during transfer, healthcare provider should also accompany the patient.

B: Control

The lead healthcare provider needs to take control quickly; identify and agree who is in charge, identify what needs to be done and who is going to do it. The most experienced healthcare provider needs to be involved in person or, if this is not possible, by phone. Allocate clearly explained tasks to those who are helping provide care. Make sure there is a clear 'chain of command' working as a team.

C: Communicate

It is very important that the woman and her relatives are aware and informed of what is happening.

Referral of any patient always requires the cooperation and involvement of several healthcare providers. Identify the key people involved and inform them as accurately and as early as possible.

Pass on information clearly and unambiguously (verbally and on paper if possible).

Important information to pass on is:

- Who you are
- What are the patient's relevant details
- What is the problem
- What has been done so far to address the problem
- What is needed next
- The reason for the referral

E: Evaluate

The risks of referral must be balanced against the risks of staying and continuing to provide care. What is the benefit of referring the patient to another place for care? Can care only be given by the receiving centre?

For example, a critically ill woman may need transfer because she needs:

Basic Emergency Obstetric Care (BEmOC) and is at home in the village

Needs Comprehensive Emergency Obstetric Care (CEmOC) and is in a healthcare facility which is only able to provide (BEmOC).

Once it has been established that referral is needed, it is also important to evaluate the urgency. The degree of urgency for referral and the severity of the woman and/or baby's condition will help to decide, 1) the type of transport to be used, and, 2) whether or not a healthcare provider needs to accompany the patient during transfer.

Table 3.5: Signal functions of Basic and Comprehensive Emergency Obstetric Care (EmOC)

Basic Emergency Obstetric Care (BEmOC)	Comprehensive Emergency Obstetric Care (CEmOC)
1. IV/IM antibiotics 2. IV/IM oxytocics 3. IV/IM anticonvulsants 4. Manual removal of placenta 5. Removal of retained products of conception (e.g. Manual Vacuum Aspiration (MVA)) 6. Assisted vaginal delivery (e.g. ventouse) 7. Newborn resuscitation with bag and mask	All Basic EmOC signal functions (1-7) plus: 8. Caesarean Section 9. Blood Transfusion

P: Prepare

Make sure that the woman and/or baby's condition is as stable as possible before transfer and remains so or improves during transfer. Identify the safest and shortest route. The aim is to ensure that there is no change in the level of care provided during transfer and that there is no further deterioration in the woman and/or baby's condition during transfer. It is very important to inform the receiving healthcare facility about the condition of the woman and/or the baby and when they can expect arrival. This so the accepting healthcare facility and healthcare providers are ready to receive the patient and can start care as soon as the patient arrives at the healthcare facility.

Decide what is needed and make sure that:

1. A healthcare provider is present who can receive and treat the patient
2. Relatives who can donate blood are identified
3. The baby travels with the mother
4. Essential emergency drugs and supplies needed during the transfer are available (i.e. there is no interruption in the care required by the woman or baby during transfer
5. A referral note is written clearly setting out condition of the patient and the reasons for referral.
6. Adequate resuscitation has been carried out (e.g., the airway is clear, IV line is in place before and during the transfer)
7. Supplies of drugs and fluids should be more than adequate for the whole of the journey.
8. All IV lines, catheter (if applicable) should be well secured to the patient.
9. The patient (woman and baby) should be in a secure and safe position during the transfer.
10. All written documents (such as case notes, antenatal records, handover letter) should accompany the patient.

T: Transport

As much as possible the standard of care received before transfer needs to be maintained during transfer and until the patient is received by, and handed over to, the next healthcare provider at the receiving healthcare facility.

During the journey:

11. Watch the IV infusion.
12. If the journey is long, administer all required treatment on the way
13. Keep a record of all IV fluids and medication given and the time of administration
14. Continue to monitor and record the woman and/or baby's condition including vital signs, blood loss, any change in condition etc.

Table 3.6: Examples of emergency drugs and supplies that may be needed during transfer of a patient

Emergency drugs	**Emergency supplies**	**If delivery is anticipated on the way:**
- Oxytocin	- Gloves	- Soap, towels
- Ergometrine	- Set for giving IV fluids	- Disposable delivery kit (blade, 3 ties)
- Magnesium sulphate	- IV fluids	- Clean cloths (3) for receiving, drying and wrapping the baby
- Calcium gluconate	- Sterile syringes and needles	- gloves
- Diazepam	- Urinary catheter	- Plastic bag for placenta
- Ringer's lactate	- Antiseptic solution	- Pinard stethoscope or Doptone to assess fetal heart rage
	- Container for sharps	- Resuscitation bag and mask for the baby
	- Bag for rubbish - Torch and extra battery - Gauze/ cotton wool (sterile) - Pinard stethoscope or Doptone	

On arrival at the healthcare facility to which the woman and/or baby are referred, direct contact must be made with the receiving healthcare provider who will take over care of the woman and/or the baby. All documents should be handed over and a full explanation given of the course of events. The receiving healthcare facility and healthcare provider should ensure feedback is provided back to the referring facility once the condition of the woman and/or baby is stabilised.

Although in the past the 'first delay' was considered the most important delay, there is new evidence to show that the majority of women and/or babies do access care at time of birth

and/or when complications occur but there are very significant 'third delays' at healthcare facility level. Healthcare providers can work together to reduce the 'third delay' and this will save lives.

Table 3.7: Points to remember

	Need to know and prepare for
Before Referral	■ WHAT - are the reasons for the referral? ■ WHEN - should you move the woman and/or baby? ■ HOW - will you arrange transport - will you let the receiving healthcare facility know? ■ WHO - should accompany the woman and/or baby?
During Transfer Referral	■ WHAT - will the woman or baby need during transfer? ■ HOW - long will the transfer take? Will the woman and/or baby be monitored during transfer?
On arrival	■ Who – will receive the woman or baby? ■ HOW - will the woman and/or her baby be seen as soon as possible by the right person? ■ WHAT - information does the receiving healthcare provider need?

MODULE 4: THE STRUCTURED APPROACH

4.1: Introduction

The structured approach is a way of managing seriously ill or injured patients. It prioritises their medical problems according to severity and the speed with which they need to be treated. It is logical and avoids major, immediately life-threatening medical problems being overlooked. It is used internationally.

This is the structured approach:

1. Primary survey
2. Resuscitate patient based on problems identified in the primary survey
3. Assess the foetus
4. Secondary survey
5. Treat problems identified in the secondary survey

Approaching a woman with a life-threatening condition

Prior to dealing with the life-threatening situation using the primary survey, assess (hearing and seeing) for any **DANGER** to you or your assistants or the patient (pool of blood with a risk of someone slipping, furniture or equipment causing obstruction of movement etc.). Then quickly make the area safe before proceeding.
Then assess for a **RESPONSE** from the woman with a life-threatening condition by calling her name if no response, by holding both shoulders, **SHAKE** and **SHOUT** her name (Hello, Hello Mrs Tilt!).

NOTE: If there are several women with life-threatening conditions, those that are unresponsive take priority

Primary survey

The primary survey is the ABCD approach. It identifies in turn life-threatening problems with the:

- **A**irway
- **B**reathing
- **C**irculation
- **D**isability (level of consciousness)

A is assessed and as a problem is identified it is treated	then...	**B** is assessed and as a problem is identified it is treated	then...	**C** is assessed and as a problem is identified it is treated	then...	**D** is assessed and as a problem is identified it is treated

As each problem is assessed and treated it is important to reassess to see if the treatment has been successful

Table 4.1: Assessment in the primary survey

A is assessed by:	■ "Hello, how are you, Mrs Tilt?"
	■ Look for chest movement, listen for noisy breathing, feel for air movement in and out of the mouth or nose
B is assessed by:	
	■ listen with stethoscope for air entry, crackles. ■ count the respiratory rate
C is assessed by:	■ heart rate ■ capillary refill
	■ skin temperature and colour
	■ level of brain function
	■ urine output
	■ foetal heart
	■ blood pressure
D is assessed by the AVPU method:	
	■ **A** – if the patient is alert
	■ **V** – if the patient is not alert but is responding to voice
	■ **P** – if the patient is not responding to voice but is responding to pain
	■ **U** – if the patient is unresponsive

Resuscitation then takes place, depending on the problems found in the primary survey, then assess foetal wellbeing, then treatment of problems found in the secondary survey.

Secondary survey

The secondary survey looks for problems not found in the primary survey, by taking a detailed history exploring the presenting symptoms then carrying out a detailed examination working from head to toe to identify important signs. As this is done, think of other potential problems or complications associated with the main condition. For example, in a case of pre-eclampsia, there may be liver and blood complications (HELLP-haemolysis, elevated liver enzymes and low platelets). During the lecture and breakout sessions, it is important to make the students think about causes and other potential problems in detail.

MODULE 5: RESUSCITATION

Station 5.1: Maintaining the airway and rescue breaths (skill)

Equipment List

- Airway head and model of the larynx
- Pocket mask
- Self-inflating bag and mask x 1 (e.g. Ambu® bag and mask)
- Spontaneously breathing oxygen mask
- Oropharyngeal airway
- Yankauer sucker
- Stethoscope x 1

Key teaching points

In this session, participants will learn airway skills needed when assessing poorly responsive patients and, if the patient is not breathing, the skills to deliver ventilation breaths during CPR.

The full sequence of treatment during CPR is covered in another station.

These are important skills and it is important that all candidates get a chance to demonstrate them. Use time efficiently to ensure this. It may be helpful to go through steps 1) to 3), below, with the whole group and then, if you have enough facilitators and extra sets of equipment, split into 2 or more groups to cover step 4) in the time available.

Key learning objectives

- To learn how to assess the airway
- To develop skills to open and maintain the airway
- To develop skills to deliver breaths to the patient who is not breathing

Instructions

1) Demonstrate the mechanism and usefulness of head tilt/chin lift by getting the participants to flex their heads (putting their chin on their chest) and take a deep breath. Then have them extend their heads (by lifting their chin off their chest) so that they are in the "sniffing the morning air" position and do the same, recognising how much easier the flow of air is when the neck is extended. Use the model of the larynx to show how these manoeuvres lift the tongue out of the pharynx and hence clear the airway.

2) Talk them through and demonstrate step by step the approach to the poorly responsive patient and demonstrate the airway opening manoeuvres and insertion of an oropharyngeal airway in order to open the airway in a breathing patient (outlined below).

3) Then talk them through and demonstrate how to deliver ventilation breaths via a bag-valve-mask during CPR (outlined below).

4) One-by-one observe each candidates' initial approach to the poorly responsive patient:

- Assess DANGER, check RESPONSE and call for help

- Apply “tilt” (Left Uterine Displacement)
- Assess, open & maintain airway
- Look, listen & feel for breathing
- Give oxygen if available
- Continue assessment and close monitoring

Then assess their ability to deliver ventilation breaths during CPR:

- Assess, open & maintain airway
- GOOD position
- GOOD seal
- GOOD chest rise

Initial approach to the poorly responsive patient

Shake and shout: “Hello Mrs. LUD” – **(patient is unresponsive).** The participant should call for help and make efforts to produce L**eft Uterine Displacement** (in a woman who is 20 or more weeks pregnant, with a uterus above the umbilicus). As they are the sole responder this is best achieved using a folded towel under the right hip to produce a left lateral “tilt”.

Airway

Assess (No more than 10 seconds):

Look for obstructing material e.g. secretions, vomit or blood. Gentle suctioning only if necessary, to clear material. **(Nothing seen in airway)**
Listen for airway sounds e.g. gurgling, snoring, stridor **(snoring heard)**
Feel for air movement with the hand/ear. **(a little air movement felt)**

This snoring sound suggests that the airway is partially obstructed and needs to be opened

Open:
Using **head tilt/chin lift**. Whilst one hand is tilting (extending) the head on the neck by pushing the back of the head (occiput) towards the base of the neck, the other hand can be lifting the chin towards the ceiling. Ideally, this procedure should leave the head and neck in the “sniffing the morning air” position with the mouth still open. **NB** do not place your hands behind the neck as this may cause a neck injury.

A **jaw thrust** can be used as an alternative to or in combination with a head tilt/chin lift. This is performed by placing two fingers of each hand behind the angle of the patient’s jaw on each side and pulling it forward/upward toward the ceiling. Again, this will be more effective if the mouth is simultaneously opened by the manoeuvre.

Emphasise the importance of assessing the success of each opening manoeuvre e.g. improvement of the chest and air movement and/or disappearance of snoring/gurgling.
(a combined head tilt/chin lift & jaw thrust removes the snoring, but it will re-occur when the airway is unattended)

Maintain:

In an unconscious patient, it is often necessary to maintain an open airway by using *positioning* or *airway adjuncts*.
In certain situations, it may be appropriate to place a breathing patient in the recovery position and this may help maintain the open airway.

Oropharyngeal airway adjuncts are useful but when tolerated this represents a worryingly low conscious level. An oropharyngeal airway will trigger a gag reflex in a conscious patient. They should be used only on unconscious patients. Demonstrate how to do this: inserting the airway 'upside down' at the beginning so that it pushes the tongue down and out of the way and then turning it the right way up so the tip is posterior to the base of the tongue.

Nasopharyngeal airway adjuncts, if available, are inserted into the nose and may be used on a conscious, responsive, or unconscious patient, Unlike the oral airway, the nasal airway, nasopharyngeal airways do not stimulate a gag reflex. Therefore, are better tolerated by conscious patients.

(the airway remains open with the aid of an oropharyngeal airway adjunct)

If the patient is breathing, put on oxygen (if available) at the maximum flow (12 litres/minute).

Ventilation breaths during CPR

If the patient is not breathing, then we perform CPR. After 30 good quality chest compressions (5-6cm depth and at the rate of 100-120 compressions per minute) we need to give 2 gentle ventilations. This is achieved by paying attention to:

GOOD position: maintaining an open airway

GOOD seal:

Firmly apply the mask (BagValveMask) using the thumb of each hand on the upper (nose) portion and the index finger on each side of the lower (chin) portion with the other fingers pulling the jaw upwards.

Alternatively use the thenar eminences to hold the mask on the patient's face, while lifting up the jaw with the fingers, as shown below.

GOOD chest rise: squeeze the bag with enough pressure to produce adequate chest rise.

Discussion points

Emphasise that to be able to oxygenate the patient by facemask and bag is lifesaving in itself and there is no need for the non-anaesthetist to try to intubate the patient if they are able to oxygenate in this way.

Emphasise that you must see the chest moving. If the chest isn't moving, you are not ventilating the patient

Station 5.2: Cardiopulmonary resuscitation **CPR** (skill)

Equipment List	
■ Pocket mask x 2	■ CPR torso (Little Annie®, Laerdel Medical AS) x 2
■ Self-inflating bag and mask x 2 (e.g. Ambu® bag and mask)	■ Stethoscope x 2
■ Spontaneously breathing oxygen mask x 2	■ Flipchart and pens (to write up 4Hs and 4Ts)

Key teaching points

This station covers the skills necessary to perform **good quality CPR**. Have a copy of the algorithm on display and explain that participants can refer to this if necessary, throughout this station. Briefly talk them through the algorithm pointing out that during this station they will be taught how to quickly *establish cardiac arrest* (response, airway &breathing) and how to perform CPR (chest compressions and gentle ventilations).

This includes **assess**ing, **open**ing and **maintain**ing the airway and delivering ventilation breaths. However, these airway skills are covered in more detail in another station during this session (Station 2.1). Demonstrate the performance of CPR and then quickly run through the scenario (below) several times so that each can be observed performing this key skill using the algorithm to guide them through each step. Take more time with the first scenario so that you can ensure understanding and then speed up with each repeated scenario so that each candidate can develop confidence with the sequence of the algorithm.

Key learning objectives
■ To outline the sequence of actions in the CPR algorithm
■ To practice the approach to the apparently lifeless patient, including establishing cardiac arrest.
■ To consolidate airway and rescue-breath skills
■ To learn the technique of chest compressions

Instructions

"Hello Mrs. LUD?"

Make sure they ensure a safe environment for them and the patient, they shake to ensure unresponsiveness and they shout for help. ***(There is no response.)***

AIRWAY. With ear or back of hand to nose and mouth…

ASSESS the airway. Look: *no signs of any obstructing material.* **Listen**: *no airway sounds audible*. **Feel:** *no air movement can be felt.*

OPEN the airway. Use airway opening manoeuvres of **head tilt**, **chin lift** and possibly **jaw thrust**.

MAINTAIN the airway. Use an oropharyngeal airway to keep the airway patent.

IS there any BREATHING? (This assessment should not exceed 10 seconds)
With ear to patient's nose and mouth…
Look: no chest movement
Listen: no breathing sounds
Feel: no air movement felt

CPR with LUD
If there is no response, assume there has been a cardiac arrest and very quickly get help (senior midwife, doctor) and return to patient.
Turn patient on to her back using left lateral tilt or manual lateral displacement (if help available), if she is more than 20 weeks pregnant or fundal height above umbilicus, to minimise aortocaval compression.
NB The patient must be on a firm hard surface not a soft mattress, otherwise the compressions will push their body down into the mattress rather than compressing the chest.

Ask them to explain how to deliver… **Good quality chest compressions**
GOOD position: palm of dominant hand placed on lower half of sternum. Interlock fingers with those of the other hand. Use straight arms and stand with weight over the patient.
GOOD depth: 5-6 cm depression and allow full recoil.
GOOD rate: 100-120 compressions per minute.

Ensure they… **Give 30 compressions to 2 ventilations**

To give adequate ventilations the candidate should ensure
GOOD position: maintain the head tilt, chin lift +/- jaw thrust
GOOD seal: make sure that the grip ensures minimal air leak around the sides of the mask
GOOD chest rise: a gentle rise of the chest is all that is required.
If available, high-flow oxygen should be given as soon as possible.

To protect against fatigue in the person delivering chest compressions they should be changed every 5 cycles of 30 compressions: 2 ventilations. Take this opportunity to recheck the circulation (feel carotid pulse) whilst minimising interruptions to compressions.

Note: The maximum interruption in chest compression to give two breaths should not exceed 10 seconds

Discussion points

After this practice station, lead the discussion(s):

The participants should understand that CPR is not a definitive treatment, but a temporising measure to maintain an oxygenated circulation whilst a potentially reversible cause for the cardiac arrest is identified and treated if this is possible.

1. Discuss the reversible causes and treatment of these underlying causes of cardiac arrest:

   - ■ **4Hs**: □ **H**ypoxia
     □ **H**ypovolaemia

- □ **H**ypo or hyperkalaemia (or other metabolic disorder)
- □ **H**ypothermia
- ■ **4Ts**: □ **T**hromboembolic (pulmonary embolism and amniotic fluid embolism)
  - □ **T**oxic (magnesium or drugs associated with regional or general anaesthesia)
  - □ **T**ension pneumothorax
  - □ Cardiac **T**amponade

2. Discuss when it would be appropriate to discontinue resuscitative efforts, referring to local guidelines. Consider the following:

- If the patient opens their eyes, starts moving or breathing spontaneously
- There are obvious signs of death
- The caregiver is exhausted and cannot continue the CPR efforts
- Resuscitation efforts have gone on for more than 30 minutes
- If all reversible causes have been either excluded or treated if it is possible to treat in your location

3. Discuss the possibility of performing an emergency caesarean section if aggressive CPR with a properly positioned patient is not successful after 4–5 minutes. Emphasise that the point is to try to resuscitate the mother after all else has failed by reducing the size of the uterus. This alleviates pressure on the diaphragm and increases blood flow to more vital organs. The fetus may occasionally survive but the point is to try to save the **mother.**

DO NOT PUSH THIS POINT IF IT IS NOT WELL RECEIVED

Note: Peri-mortem caesarean section is not possible and/or is not accepted practice in many resource-poor countries. At least reiterate the point that aortocaval compression by a 20-week or more foetus will hinder resuscitation.

Station 5.3: Resuscitation and care of the newborn (skill)

Equipment List	
■ Clock x 2	■ Stethoscope x 2
■ Towels x 2	■ Heat source (pretend)
■ Baby x 2	■ Identified designated area for resuscitation
■ Self-inflating bag and mask x 2 (e.g. Ambu® bag and mask)	

Key teaching points

- The sequence of steps in assessing the newborn baby
- The structured approach to identifying early warning signs of a sick newborn and providing prompt treatment

Key learning objectives
■ To recognise the newborn requiring resuscitation
■ To practice resuscitation of the newborn
■ To discuss the initial management of the newborn

Instructions

As for maternal CPR, run through the key skills and then make sure that each candidate gets the chance to practice. This can be aided by splitting into 2 or more groups if resources and facilitators are available.
Have a copy of the Helping Babies Breathe algorithm on display and encourage candidates to refer to it during this session.

Discuss how to prepare for delivery

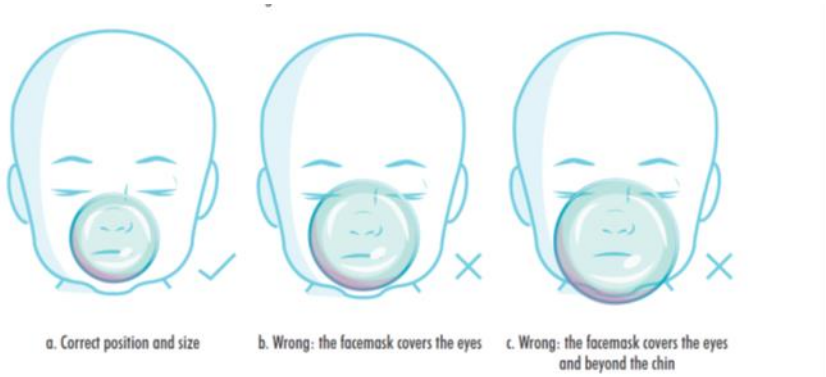
- Ensure the room is warm. Close windows and doors to prevent drafts, and switch on your radiant heater or equivalent
- Identify a skilled helper who will be readily available
- Prepare a warm, dry, flat and well-lit safe space for the baby to receive ventilation if required.
- Check that the ambubag and masks are ready, clean and in working order
- Aim to have different sized masks available (size 0 and size 1)
- Ensure that you have a suitable suction device present
- Place a clean dry cloth or towel on the mother's chest ready to dry the baby and have a second available to wrap the baby after drying
- Have a hat ready to put on the baby's head
- Wash your hands

The facilitator then demonstrates the steps taken in newborn resuscitation

Facilitator: "Imagine you are in the labour ward here and you have just been called by your colleague who has delivered a baby girl who looks lifeless."

Facilitator should demonstrate:

- Note time of birth, start the clock if using a stop clock
- Dry and warm the baby. Use the cloth placed on the mother's chest to dry the baby thoroughly, rubbing the body, head, arms and legs. Drying the back helps to stimulate breathing
- Remove the wet cloth and if the baby is crying place skin to skin with the mother, covering the baby with the dry cloth and putting on the hat. Delay cord clamping for 1 to 3 minutes
- As you dry the baby, evaluate his or her condition: Is the baby crying?
- Babies who do not cry may not be breathing. A baby not breathing is limp and does not move. The skin may be pale or blueish.
- A baby who is gasping or not breathing at all needs immediate help
- Keep the baby warm, either keep on the mother's chest or abdomen or on a warm blanket beside the mother
- Position the head with the neck slightly extended to open the airway
- If secretions or meconium are obviously blocking the airway use the bulb sucker briefly and under direct vision only, squeezing the bulb before placing in the baby's mouth and releasing the squeeze before withdrawing
- Rub the baby's back 2 or 3 times to stimulate breathing
- All of the above should take place within the first minute (The Golden Minute)
- If still not breathing or gasping is present:
- Clamp and cut the cord and take the baby quickly to the resuscitation area
- Quickly position the baby in the neutral position with the head slightly extended. It may help to place a 2 cm thick roll of cloth under the baby's shoulders to compensate for a prominent occiput. and commence bag and mask ventilation using the correct size of mask for the baby (Most term babies require a size 1 mask, whilst size 0 is more appropriate for premature or small babies) A mask that is too large will not seal well on the face and air will leak whilst a mask that is too small will not cover both the nose and mouth. An appropriately sized mask should cover the nose and mouth and sit in the grove of the chin



- It is best to stand behind the baby's head to obtain a good position for ventilation

- Demonstrate correct application of the mask, holding it in place whist maintaining an open airway. Use the thumb and forefinger to make a "C" shape and hold the mask on the face, using the middle finger to lift the chin up towards the mask. The fourth and fifth finger can be used along the jaw to lift it forwards and help maintain an open airway. Be careful to avoid compressing the trachea with these fingers. Make a tight seal by pressing lightly on the top of the mask and gently holding the chin up towards the mask. Avoid pushing the mask down onto the face as this may change the head position and block the airway.
- Squeeze the bag smoothly between the thumb and two fingers of the other hand. AS you squeeze count 1, then 2,3 as you release the bag. Ventilate at a rate of 40 breaths per minute
- **NB THE CHEST MUST MOVE** If the chest is not seen to be moving with ventilations, air is not entering the lungs
- If you don't see the chest move, reapply the mask to make a better seal at the same time as repositioning the head to open the airway. Note that if the neck is extended to far the airway will block
- Keep ventilating with good chest movement until the baby begins to breathe
- If the baby does not start to breathe, call for help
- Check the mouth for any obstructions
- Reposition and reapply the mask. If available, a neonatal oropharyngeal airway may be of help. Demonstrate how this is inserted in a baby (different from adult)
- Try squeezing the bag a bit harder to give a larger breath
- If the baby does not begin to breathe after 1 minute of ventilation with chest movement, evaluate the heart rate. Good quality ventilation should lead to improved oxygenation and a normal heart rate. In babies, a healthy, well oxygenated heart should be 100/minute or more. If there is a stethoscope available, listen over the left chest, pausing ventilations for several seconds to hear the heartbeat. Otherwise, feel for the pulse at the base of the cord, or the brachial pulse. Listen to the heart rate for just long enough to establish whether it is normal or slow, then recommence ventilations
- If the heart rate is normal >100/minute), continue ventilations until the baby is breathing
- If the heart rate is slow, make sure you have taken all the steps to improve ventilation and re-evaluate breathing and heart rate, if possible using a skilled helper
- If the baby continues to need ventilation will need advanced care. If this is not available, discuss with the parents and consider stopping ventilation after 20 minutes if the heart rate is slow or the baby does not breathe.
- If there is no heart rate at all and no breathing after giving ventilation for 10 minutes stop resuscitation, the baby is dead
- Whether resuscitation has been successful or not, always explain to the mother and her companion what has happened

Once the facilitator has demonstrated, participants should all be given the opportunity to practice, paying particular attention to ensuring good mask placement and obtaining chest movement. Split the group into two to allow more time for each participant to practice.

Discuss cleaning the equipment after use.

Station 5.4 Venous cutdown (skill)

Equipment List	
■ Scalpel no. 3 x 8 (disposable scalpels with blades if available)	■ Intravenous cannulae (e.g. Venflon™) 16-guage or 18-guage x 8
■ Blades no. 10 or 15 x 8	■ Paper towels or tissue wipes
■ Mosquito artery forceps x 8 (or curved artery forceps)	■ Disposable surgical gloves
■ Artery forceps x 8	■ Sharps box x 2
■ Multipurpose suture material or linen thread/cotton x 1 roll and needles	■ Syringe labelled 'local anaesthetic'

Key teaching points

Cutdown is a technique which can be used when venous access is urgently needed and conventional routes have failed. This should be taught as a hands-on exercise. Discuss the anatomy. Ask each participant to demonstrate the site of the long saphenous vein by palpating this on their own ankles.

The four-part process of skills teaching is suggested:

1. Demonstrate the skill without commentary.
2. Demonstrate again, with commentary
3. Ask one of the participants to talk you or another student through the skill.
4. Each student then carries out the skill with their own commentary.

During or at the end of the station, discuss potential complications.

Key learning objectives
■ To learn the indications for cutdown
■ To learn and practice venous cutdown

Instructions

Anatomical considerations

The primary site for cutdown is over the long saphenous vein, above the ankle at a point approximately 2 cm anterior and 2 cm superior to the medial malleolus.

Technique

- Apply a venous tourniquet proximal to the intended cannulation site
- Prepare the skin
- Infiltrate the area with local anaesthetic
- Make a full thickness transverse incision through the skin
- By blunt dissection, identify and display the vein

- Free the vein from its bed and elevate a 2-cm length
- Ligate the distal end, leaving the suture in place for traction
- Pass a tie around the proximal end of the vein
- Make a small transverse venotomy and gently dilate the opening with the tip of a closed haemostat
- Introduce the plastic cannula (without trocar) through the venotomy and secure it in place by tying the proximal ligature
- Attach the giving set and commence flow at the required rate
- If possible, close the incision; otherwise, apply a sterile dressing and secure giving-set tubing in place (use splint and bandage if necessary; for instance, if patient restless)

Emphasis the need to ensure that cutdown is secure.

Discuss possible complications with participants:

- Haemorrhage or haematoma
- Perforation of the posterior wall of the vein
- Nerve damage
- Phlebitis
- Venous thrombosis
- Insecure cannulae

Note: Technique may differ slightly in different settings and countries.

MODULE 6 SHOCK AND THE UNCONSCIOUS PATIENT

Station 6.1 The unconscious patient (skill)

Equipment List

- Oropharyngeal airway
- Yankauer sucker
- Spontaneously breathing oxygen mask
- Stethoscope
- Canulae of various sizes
- Syringes
- Giving set
- Intravenous fluid (Ringer lactate, physiological saline)
- Blood sample bottle
- Urinary catheter
- Blood pressure cuff
- Cushions
- Pinard's stethoscope

Key teaching points

This station is about the management of the unconscious patient, from whatever cause. One of the facilitators should play the patient. The other facilitator should give a participants the history, ask them to repeat back the details and then ask them to deal with the patient as if 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 the outcome from those for the facilitator to feedback are listed below. If the participants are failing to deliver expected treatment, guide them gently through the process. Encourage team thinking and teamwork.

Key learning objectives

- To apply the **ABCD** approach to recognise and treat reduced level of consciousness.
- To apply the secondary survey, looking for cause and other pathology.
- To treat the cause and other pathology.
- To learn how to place a patient in the recovery position and the value of this in the unconscious patient.
- To apply the **AVPU** (alert, voice, pain, unresponsive) assessment.
- To apply the **ABCD** approach to recognise and treat shock.
- To apply the secondary survey to look at the cause of shock.

Instructions

Facilitator: "The midwife on duty on the labour ward (or postnatal ward) approaches a patient who delivered normally 3 hours ago and finds that she cannot be roused. You are called to the patient. What would you do?"

Ask the participant to repeat back the details then start the role play by asking someone to volunteer to deal with this problem.

Expected actions

Participant: Shake and shout.

Facilitator: No response.

Participant: Call for help.

Facilitator: Who would you call?

Participant: Other staff especially any senior people available.

Facilitator: What would you do next?

Participant: Assess airway **(A)**; look for chest movements, listen for breath sounds, listen and feel for breathing.

Facilitator: Breathing **(B) is present** but very noisy partially obstructed sounds.

Participant: Perform head tilt and chin lift.

Facilitator: This makes breathing clearer and less noisy but as soon as chin lift is released breathing becomes noisy again.

Participant: Place oropharyngeal airway.

Facilitator: Makes breathing less noisy. How will you assess Breathing (B)?

Participant: By counting the respiratory rate and auscultating the chest

Facilitator: The respiratory rate is 30/minute and the chest sounds clear. Is this normal? What will you do?

Participant: No, a respiratory rate of 30/min is abnormal. I would apply the oxygen mask.

Facilitator: This is the right thing to do if oxygen is available.

Participant: Should say they are happy with airway and breathing at the moment (if they do not, you should ask this).

Then suggest that the patient should be put into the recovery position. Explain that this position is used for the unconscious patient, as it reduces the chance of aspiration of gastric fluid into the lungs, because unconscious patients have lost their gag reflex.

Demonstrate on the patient: put the patient's left arm up beside her head with the elbow flexed, then put her right arm across her chest, bend her right leg and then pull it over to the left, at the same time as rolling her on to her left

side. Pull her towards you rather than roll her away so that she does not risk falling off the bed.

Participant: Assess circulation **(C)** by presence of pulse, colour, assessment of level of consciousness, and blood pressure.

Facilitator: The woman's heart rate is 105 beats/minute; she feels warm and well perfused and blood pressure is 90/60 mmHg.

Participant: Get intravenous access, send bloods and attach fluids.

Facilitator: What laboratory tests you would ask for and why?

Participant: Useful tests would be full blood count, malaria slide, urine dipstix, glucose, others depending on the setting.

Facilitator: What tests are locally available? How soon would results be available? [Then move on to further assessment of the patient.] What will you do next?

Participant: Assess level of consciousness by **AVPU method**.

Facilitator: Say the patient is a 'U'.

Participant: Consider the cause of altered level of consciousness.

Facilitator: Postpartum haemorrhage may have been the cause of collapse in this patient. Her state may have also been due to a convulsion or sepsis, or hypoglycaemia.

Carry out a **secondary survey** to consider possible causes:

The participant should ask and assess:

- Has there been a recent convulsion?
- Is she known to have epilepsy or diabetes?
- Eclampsia?
- Is there any neck rigidity? Meningitis?
- Assess pupils to look for signs of cerebral bleed
- Repeat vital signs: respiratory rate, heart rate and blood pressure

The participant should carry out a head-to-toe examination.

Facilitator: The patient has a fever of over 38°C [guide participants to the diagnosis of septic shock].

Expect candidate to consider sepsis, malaria, meningitis, pneumonia, Dengue fever, tuberculosis. Ask what is the most likely cause in their setting. Why? How do they confirm the diagnosis?

Discuss the possibility of undiagnosed/untreated HIV infection: Look for wasting, oral candidiasis, herpes, Kaposi's sarcoma. If AIDS is a possibility, consider encephalitis. NB: HIV related meningitis and encephalitis is less likely now that more women are tested and treated in pregnancy, but it may still happen in some circumstances.

If there is time, discuss further treatments of underlying different causes of unconsciousness, as agreed to be most likely in the local setting by the participants.

Station 6.2: Hypovolemia (scenario)

Equipment List

- Oropharyngeal airway
- Yankauer sucker
- Spontaneously breathing oxygen mask
- Stethoscope
- Canulae of various sizes
- Syringes
- Giving set
- Intravenous fluid (Ringer's lactate, physiological saline)
- Blood sample bottle
- Urinary catheter
- Blood pressure cuff
- Cushions
- Pinard's stethoscope

Key teaching points

Explain that this station is about the management of the hypovolaemic patient, from whatever cause. One of the facilitators should play the patient. The other facilitator should give the participants the history, ask them to repeat back the details and then ask them to deal with the patient as if 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 the outcome from those for the facilitator to feedback are listed below. If the participants are failing to deliver expected treatment, guide them gently through the process. Encourage team thinking and teamwork.

Key learning objectives

- To apply the **ABCD** approach to recognise and treat shock
- To apply the secondary survey looking for the cause and other pathology
- To treat the cause of shock

Instructions

Facilitator: An 18-year-old woman (para 3), who delivered 30 minutes ago, is bleeding briskly vaginally. She is pale, breathless and agitated. Observations are heart rate 140 beats/minute, blood pressure 80/60 mmHg. Repeat back these details. You are called to the patient: what would you do?

Expected actions

Participant: Call for help.

Facilitator: Who would be available?

Participant: Any other staff, especially senior people if available

Participant: Start with an assessment of airway: "Hello how are you, Mrs Tilt?" Look for chest movements, listen for breath sounds, listen and feel for breathing. (A,)

Facilitator: What next?

Participant: I would assess breathing (B) by counting the respiratory rate and auscultating the chest

Facilitator: Breathing is clear, not noisy but very rapid and shallow; respiratory rate: 34 breaths/minute.

Participant: Happy with airway but breathing very rapid and worried that this may be a sign of a 'B' problem or a 'C' problem [if not, you – facilitator – should ask this].

Participant: Apply oxygen mask.

Facilitator: Comment that this is the right thing to do if oxygen is available.

Participant: Assess circulation by the presence of a pulse, colour, assessment of the level of consciousness and blood pressure. (C)

Facilitator: The heart rate is 130 beats/minute, the patient is cool and poorly perfused; blood pressure 80/40 mmHg. Ask why skin gets cold in hypovolaemia.

Participant: Reduced respiratory rate, increased heart rate, patient cold and shut down and hypotensive: these are signs of significant hypovolaemia and I would give intravenous fluids rapidly and find the source of bleeding and stop bleeding. A reduced blood pressure at this level signifies substantial blood loss (up to 35% of the patient's circulating volume). [If not mentioned, participants should be talked through this].

Facilitator: Stress importance of pulse and respiratory rate increase being the first important indicators of hypovolaemia and emphasise again that this happens much earlier than low blood pressure.

Participant: Get intravenous access, send bloods and attach intravenous fluids.

Facilitator: Send bloods for what? Ask what tests are locally available and how soon results would be available. Useful would be full blood count. Discuss the need to crossmatch blood. How many units?

Facilitator: Ask what the source of bleeding might be and expect:

Participant: Answers:

- cervical, vaginal or perineal tear
- atonic uterus
- retained placenta or products
- coagulopathy - for example from placental abruption or simply due to heavy blood loss

Ask participants to continue to demonstrate what they would do to **ascertain a cause** and **stop bleeding** immediately. Expect:

Participant: Check that uterus is contracted and rub up a contraction.

Facilitator: This measure is effective, and the uterus is now well contracted.

Discuss the **use of oxytocics**. Also, discuss active management of the third stage: check that all participants know what this is, how to do it and why active management of the third stage is important.

Participant: **Check placenta**.

Facilitator: Complete.

Participant: Check for perineal, vaginal and cervical trauma, emphasise the need to position the patient properly with good lighting, give analgesia as required. This will ensure speedy identification and arrest of bleeding.

Facilitator: Discuss monitoring of fluids given – how much and how quickly – stress that it is important to start fluid input-output chart. Ask participants if they have such a chart. If time permits, you can ask them to make a sample chart. Emphasise that a patient may have a combination of causes for a haemorrhage, for example, one patient may have retained products, an atonic uterus and vaginal trauma. Every cause of PPH must be checked for and treated if found.

Facilitator: Discuss the use of a catheter and the amount of urine expected per hour to indicate that the patient is no longer hypovolaemic (minimum of 25 mls).

Facilitator: Briefly discuss the **secondary survey**.

Station 6.3: Septic shock (scenario)

Equipment List

- Oropharyngeal airway
- Yankauer sucker
- Spontaneously breathing oxygen mask
- Stethoscope
- Canulae of various sizes
- Syringes
- Giving set
- Intravenous fluid (Ringer's lactate, physiological saline)
- Blood sample bottle
- Urinary catheter
- Blood pressure cuff
- Cushions
- Pinard's stethoscope

Key teaching points

Explain that this station is about managing a shocked patient where the shock is caused by sepsis. One of the facilitators should play the patient. The other facilitator should give the participants the history, ask them to repeat back the details and then ask them to deal with the patient as if 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 the outcome from those for the facilitator to feedback are listed below. If the participants are failing to deliver expected treatment, guide them gently though the process. Encourage team thinking and teamwork.

Key learning objectives

- To apply the **ABCD** approach to recognise and treat septic shock.
- To apply the secondary survey to identify the cause and other pathology.
- To treat the cause of septic shock.

Instructions

History

A 23-year-old woman, day 9 post-delivery, is admitted from home to a health centre with vaginal bleeding. She has rapid laboured breathing. She has not passed urine for 18 hours. She is very drowsy.

Repeat back these details. You are called to the patient. What would you do?

Expected actions

Participant: Call for help

Facilitator: Ask who?

Participant: Other staff, especially senior people if available.

Facilitator: What do you do?

Participant: Assess airway; "Hello, how are you Mrs Tilt." Look for chest movements, listen for breath sounds, listen and feel for breathing.

Facilitator: Breathing is clear and not noisy but very rapid and laboured; respiratory rate 30 breaths/minute.

Participant: Happy with airway but breathing is very rapid, and this may be a sign of a 'B' problem or a 'C' problem [if not, you – facilitator – should ask this].

Apply oxygen mask.

Facilitator: Comment that this is the right thing to do if oxygen is available.

Participant: Assess circulation by the presence of pulse, blood pressure and colour. **(C)**

Facilitator: Pulse 129 beats/minute, blood pressure 90/40 mmHg; patient feels hot and pulse is bounding, and she is confused and agitated.

Participant: Raised respiratory rate, increased heart rate and bounding pulse are signs of sepsis and participants should check temperature, give intravenous fluids rapidly and find the source of infection and treat. If they do not, they should be talked through this and should be told that the woman's temperature is 40ºC.

Participant: Get intravenous access and send bloods and attach intravenous fluids.

Facilitator: Send bloods for what? Ask what tests are locally available and how soon results would be available. Useful laboratory examinations are full blood count, malaria parasites. Ask if blood cultures can be performed. Urine to be examined for what? Discuss the need to crossmatch blood?

Facilitator: Ask participants to demonstrate assessment of **AVPU**. Report that the patient is responsive to voice.

Facilitator: Ask participants to carry out a **secondary survey**. Expect head-to-toe examination; ask them to demonstrate.

Carry out the **secondary survey** to decide what the source of infection might be and expect:

Participant: Answers:

- endometritis
- pelvic abscess
- peritonitis
- pyelonephritis
- breast infection
- breast abscess
- abdominal or perineal wound infection
- phlebitis
- Cellulitis

- pneumonia / tuberculosis
- tonsillitis
- malaria
- meningitis
- enteric fever
- appendicitis

Facilitator: Ask about the common causes of fever locally.

Facilitator: Ask participants to discuss what they would do to treat; expect:

Participant: Give prompt appropriate broad-spectrum antibiotics intravenously [this will be discussed in greater detail in later sepsis station].

Discussion points

Note: Mostly only limited diagnostics are available. Blood cultures are not usually available. Discuss tests that can be performed locally and what this means for the choice of treatment (expect many participants to report that only malaria parasites can be identified).
Consider the possible causes of sepsis and management using the list above.

- You need to stress the point that, in malaria risk areas, after a rise in temperature health workers tend to think mostly of malaria; they need to think of other causes too. Sepsis, especially postpartum, is still one of the five main causes of mortality.
- Need to start intravenous antibiotics as well as malaria treatment.

- Treatment will often have to be presumptive as there are no diagnostics available, certainly not usually in the first 12 hours. Even when cultures are available, a bacterial diagnosis may still never be made. Emphasise that presumptive treatment must be given rapidly, within an hour of the patient presenting. For every hour of delay, mortality increases.

- Discuss whether the midwife can start intravenous antibiotics without the authorisation of a medical officer. This should be encouraged where there is a shortage of medical officers and, if there is a protocol in place this policy 'saves lives'.

- Discuss that the patient may have bought 'fake' drugs or have used self-medication.

If there is time:

- Discuss transfer to (referral) hospital if working at BEOC (basic essential obstetric care) level.
- Discuss the increased risk of sepsis in the untreated or undertreated HIV-positive patient. Note this will also be discussed in more depth in another station.

Station 6.4: Cardiogenic shock (scenario)

Equipment List	
■ Oropharyngeal airway	■ Intravenous fluid (Ringer's lactate, physiological saline)
■ Yankauer sucker	■ Blood sample bottle
■ Spontaneously breathing oxygen mask	■ Urinary catheter
■ Stethoscope	■ Blood pressure cuff
■ Canulae of various sizes	■ Cushions
■ Syringes (with different antibiotic labels)	■ Pinard's stethoscope
■ Giving set	

Key teaching points

One of the facilitators should play the patient. A cushion can be used to simulate pregnancy. The other facilitator should give participants the history, ask them to repeat back the details and then ask them to deal with the patient as if 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 the outcome from those for the facilitator to feedback are listed below. If the participants are failing to deliver expected treatment, guide them gently though the process. Encourage team thinking and teamwork.

Key learning objectives
■ To apply the **ABCD** approach to recognise and treat heart failure
■ To apply the secondary survey looking for cause and other pathology
■ To treat the cause and other pathology

Instructions

History

A 27-year-old woman, who is about 36 weeks into her first pregnancy, has been unwell over the past 3 days and was said to have complained of labour-like pains, shortness of breath and dizziness. She suddenly became very drowsy a few hours before presentation. The nurse midwife has found a respiratory rate of 40/minute, a pulse of 140 beats/minute and blood pressure 60/? mmHg. Repeat back these details. You are called. What would you do?

Expected actions

Participant: Make a diagnosis of shock and consider the possible causes of shock (hypovolaemia, septic, possibly cardiogenic and, less likely, anaphylactic).

Participant: Call for help.

Facilitator: Ask who?

Participant: Other staff, especially senior people if available.

Facilitator: What would you do next?

Participant: Place the patient in a left lateral tilt to relieve aorto-caval compression

Participant: Start with assessment of airway; "Hello, how are you, Mrs Tilt?" Assess breathing. Look for chest movements, listen for breath sounds, listen, and feel for breathing. **(A)** Count the respiratory rate and auscultate the chest **(B)**.

Facilitator: Say that when you look at her you notice that the conjunctivae and lips are pale, her breathing is shallow but clear; respiratory rate 40 breaths/minute.

Participant: Participants should say that they are happy with the airway, but breathing is very rapid, and they are worried that this may be a sign of a 'B' problem or a 'C' problem.

Facilitator: Prompt participants to examine the chest. Chest findings are of rapid breathing and bilateral basal crepitations. A systolic heart murmur is also detected.

Participant: Apply oxygen mask.

Facilitator: Comment that this is the right thing to do if oxygen is available.

Participant: Move quickly to assess circulation by the presence of a pulse, colour, assessment of the level of consciousness, blood pressure. **(C)**

Facilitator: Tell the participants again that the conjunctivae are pale, the patient is cold and clammy, her pulse is 140 beats/minute, blood pressure is 60/?mmHg (diastolic is unrecordable) and she is very drowsy and exhausted.

Participant: Participants should say that this is a case of hypovolaemia, sepsis or heart failure possibly caused by anaemia, or with anaemia exacerbating existing heart disease. Hypovolaemia must be excluded: they must exclude a ruptured uterus or placental abruption by abdominal examination and rule out vaginal bleeding.

Facilitator: Say that the patient is having contractions but has no vaginal bleeding.

Participant: Get intravenous access and send blood and attach intravenous fluids.

Facilitator: She becomes unresponsive; what do you do?

Participant: Assess level of consciousness: **AVPU**.

Facilitator: Ask the participant to demonstrate: 'Why do we need to do that?'

Facilitator: Ask what blood tests should be done

Facilitator: Discuss the **secondary survey**, what can be done locally and how soon results would be available. Useful would be haemoglobin, full blood count, malaria parasites? others.

Results mps = negative, Hb = 5.0 g/dl

Participant: Take temperature.

Facilitator: 37°C.

The participant should carry out systematic "top to toe" secondary survey.

Facilitator: What are the risks of giving blood or fluid, especially in this patient?

Participant: Volume overload, making the heart failure worse. Preferably give packed cells but, if no packed cells available, consider hanging blood so that cells separate from plasma. The blood to be given will be concentrated with less plasma volume with less risk of overloading the patient in heart failure.

Facilitator: Discuss how people would give blood locally in such a case, including how much. Discuss the administration of furosemide in patients with cardiac failure receiving a transfusion.

Discuss how once a diagnosis of cardiogenic shock has been made, the rate of infusion must be slowed down. Giving 2 litres in the first hour is not appropriate and would be dangerous, as heart failure would worsen with the risk of increased pulmonary oedema.

Discuss the need to give adequate amounts of blood in cases of cardiogenic shock secondary to anaemia) but slowly.

Ask if anyone has experienced such a case and what was the haemoglobin level.

Explain that it is not uncommon to find haemoglobin less than 5 g/dl, which had not been detected antenatally. This is often chronic anaemia, so the woman 'copes' generally but may decompensate when heavy work (exercise) of labour and delivery is added.

Station 6.5: Pulmonary embolism (scenario)

Equipment List

- Oropharyngeal airway
- Yankauer sucker
- Spontaneously breathing oxygen mask
- Stethoscope
- Canulae of various sizes
- Syringes
- Giving set
- Intravenous fluid (Ringers lactate, normal saline)
- Blood sample bottle
- Urinary catheter
- ECG stickers
- Blood pressure cuff
- Anticoagulation labels
- Cushion/wedge

Key teaching points

One of the facilitators should play the patient. The other facilitator should give the participants the history, ask them to repeat back the details and then ask them to deal with the patient as if 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 the outcome from those for the facilitator to feedback are listed below. If the participants are failing to deliver expected treatment, guide them gently though the process. Encourage team thinking and teamwork.

Key learning objectives

- To apply the **ABCD** approach and to recognise pulmonary embolism as the cause of shock
- To understand how to further confirm the diagnosis of pulmonary embolism
- To apply the secondary survey to identify other pathology and the cause of pulmonary embolism
- To treat pulmonary embolism

Instructions

History

A 36-year-old woman (gravida 5, para 5) had a caesarean section three days ago. She weighs 90kg. You are called by the midwife, who says that the patient has acute chest pain, has complained of breathlessness, and collapsed after she went to the toilet. Her respiration rate is 35 breaths/minute, her pulse130 beats/minute and her blood pressure 80/30mmHg. Repeat back these details. What would you do?

Expected actions

Participant: Make a diagnosis of shock.

Participant: Call for help.

Facilitator: Ask who?

Participant: Other staff especially any senior people if available.

Participant: Assess airway: "Hello, how are you, Mrs Tilt?" **(A)**

Facilitator: She speaks to you (A) and says she can't breathe. Say that as she can speak the airway must be open. Ask what next?

Participant: Look for chest movements, auscultate for breath sounds, and count the respiratory rate**(B)**

Facilitator: Say that her breathing is rapid at 35 breaths/minute.

Participant: Participants should say that they are happy with the airway but breathing is very rapid and they are worried that this may be a sign of a 'B' problem or a 'C' problem.

Facilitator: Prompt the participants to examine the chest. Normal chest findings, except for rapid breathing and a pleural rub over the right lower lobe.

Participant: Apply oxygen mask.

Facilitator: Comment that this is the right thing to do if oxygen is available.

Participant: Move quickly to assess circulation by the presence of a pulse, colour, assessment of the level of consciousness, blood pressure. **(C)**

Facilitator: Tell the participants again that the pulse is 130 beats/minute, blood pressure 80/30 mmHg; patient very short of breath and exhausted

Participant: Participant should say that hypovolaemia, sepsis or pulmonary embolism should be excluded. Hypovolaemia must be excluded. Check for vaginal bleeding

Facilitator: Say that the woman has no vaginal bleeding.

Participant: Get intravenous access and send bloods and attach intravenous fluids.

Facilitator: Send bloods for what? Useful would be blood gas, haemoglobin and blood glucose.

Participant: Take temperature.

Facilitator: Temperature is 36.5°C.

Facilitator: What other tests would you perform to help diagnose a pulmonary embolism?

Participant : ECG, chest X-ray, ventilation-perfusion scan if available.

Participants should then say that they will start the patient on anticoagulation before sending for tests.

Facilitator: What treatment?

Participant: Intravenous heparin, with a plan to convert to oral warfarin.

Discussion points

1. Lead a further discussion on risk factors for deep venous thrombosis/pulmonary embolism.
2. Discuss any other signs that may be present, e.g. signs of Deep Venous Thrombosis (not always present)
3. Discuss the need to exclude other pathology as a cause of pulmonary embolism.
4. Explain that breast feeding is possible with heparin or warfarin therapy.

MODULE 7: PRE-ECLAMPSIA AND ECLAMPSIA

Station 7.1: Recognition (workshop)

Equipment List

- Oropharyngeal airway
- Yankauer sucker
- Spontaneously breathing oxygen mask
- Stethoscope
- Canulae of various sizes
- Syringes
- Giving set
- Intravenous fluid (Ringer's lactate, normal saline)
- Blood sample bottle
- Urinary catheter and bag
- Blood pressure cuff
- Cushions
- Patella hammer
- Pinard's stethoscope
- Urine dipsticks
- Sterile universal container
- Syringes labelled: magnesium sulphate, calcium gluconate, labetolol, hydralazine
- Containers labelled methyldopa, nifedipine

Methodology and approach

The purpose of this station is to discuss the presentation of pre-eclampsia and severe pre-eclampsia or imminent eclampsia. It is suggested that one of the facilitators acts as the patient, who is attending antenatal clinic at the facility but feels that she is not unwell and should not be admitted as she has other children at home to care for.

The other facilitator should give participants the case history and findings, ask them to repeat back the details and then ask them to manage the patient as if in real life.

The expected actions of the participant and the outcome from those for the facilitator to feedback are listed below. If the participants fail to deliver expected treatment, guide them gently though the process. Other members of the group can act as assistants.

Encourage teamwork. Point out that there is equipment available on the adjacent table for them to use. Although this is a very serious and important subject, it has been found that this scenario is an opportunity to introduce some fun into learning as the 'patient' is continually trying to deny symptoms and is ready to go back home.

Key learning objectives
■ To be able to recognize a case of severe pre-eclampsia ■ To practice the skills of conveying the seriousness of severe pre-eclampsia to a woman otherwise asymptomatic

Instructions

Case History

This patient (Use a local name) is aged 28 years (gravida 6, para 5) who is 36/40 weeks pregnant and has presented to the antenatal clinic for routine antenatal care. The midwife from the antenatal clinic reports that her blood pressure is 148/96 mmHg, proteinuria 2+.

Ask the participants to ask the patient specific questions about her symptoms. Questions should specifically include:

- Do you have a headache?
- Do you suffer from blurred vision?
- Do you notice light flashes?
- Do you have any abdominal pain?

The patient complains of headache, blurred vision and this morning had some epigastric pain.

Ask the participants to carry out a physical examination. Ensure this is a complete examination.

On examination, you find the patient to have a BP of 165/115, hyperreflexia with clonus. The fetal heart rate is 120 beats/minute and regular. What would you do?

Expected actions

***Participant**:* *Give initial explanation to patient about her condition.*

Facilitator: Expect the participants to agree that this is a clear case of severe pre-eclampsia. The seriousness of her condition should be put into context but in a supportive and undramatic way. Explain that delivery of fetus and placenta are an essential component of the treatment, but that this must be done in a controlled and unrushed fashion. Blood pressure must be treated, and something must be given to prevent worsening of her condition (magnesium sulphate to prevent fits). Explain that it might be necessary to give some drugs before delivery that will help the baby's lungs once born (corticosteriods usually for pregnancies less than 24 and 34 weeks). (Please note that different countries or settings will use a different cut-off. For example, 28-34/36 weeks.) Also, unless the patient has had an ultrasound scan early in pregnancy, precise gestational age may not be known.

Note: The WHO has recommended that there is no benefit for corticosteroids for fetal lung maturity after 34 completed weeks (WHO, 2017)

Corticosteroids

1. Two doses of betamethasone 12mg IM 12 hours apart

OR

2. Four doses of dexamethasone 6mg IM in 24 hours or two doses of 12 mg orally 12 hours apart

***Participant**:* *Take a detailed case history.*

[Expect] How long has she felt unwell? When did headache, blurred vision and epigastric pain start? Does she feel breathless? Has she had any vaginal bleeding? Does she still feel her baby move? Ask about her gestational age (expect a vague answer). Ask if patient has already had medication or has self-medicated?

Facilitator: What would you do next?

***Participant**:* *Examine further.*

Facilitator: Ask participant to demonstrate.

Say that you find that blood pressure is 180/115 mmHg; there is hyperreflexia and more than three beats of clonus.

***Participant**:* *Send bloods for further investigations.*

Facilitator: Ask which blood tests can be performed.

Expect haemoglobin or urea & electrolytes (usually cannot be done but, if possible, to full blood count then platelet count important). Discuss possible results briefly. Discuss if possible, to test for urea, creatinine, liver enzymes (ALT) and/or urinary PCR (protein creatinine ratio).

***Participant**:* *Describe to patient reasons for staying in hospital and proposed course of action/monitoring/delivery.*

Facilitator: Expect as above.

Facilitator 2 to come up with every possible reason not to stay and question in detail what will be done to her and why. This will enable the participant with the help of a team to provide a full and detailed set of answers outlining further management and reasons for admission or referral straight away.

Ask <u>all</u> participants to practise deep tendon reflexes and assessment of clonus: magnesium sulphate can be administered in BEmONC setting and it is important to be able to monitor patients on this anticonvulsant via the testing of reflexes, (as well as the respiratory rate, conscious level and urine output).

Discussion points

1. Briefly discuss different levels in the health system at which you might find this patient. How would they arrange transfer if needed? How would staff expect to receive patient when transferred?
2. What if a diagnosis of severe pre-eclampsia without symptoms but a viable fetus at GA 24-34 weeks? What would you do at the various levels of care?
3.
    a. Administer Corticosteroids.
    N.B. Although for maximum benefit there should be a gap of 24 hours between the final dose and delivery, it is important not to wait if the patient's condition warrants earlier delivery.
    b. Treat hypertension. Commence Magnesium Sulphate. Once Magnesium Sulphate has been commenced there is a commitment to continue until either 24 hours after delivery or 24 hours after the final post-partum convulsion in the event of eclampsia. Magnesium Sulphate is not intended for long term use, but when delivery is likely to occur soon.
    c. Expectant management provided no maternal danger signs (severe headaches, visual changes, abdominal pains), fetal distress and hypertension is controlled. Adequate monitoring of mother and baby should be available.
    d. In the absence of c above, transfer mother after starting a and b, to a facility where adequate capacity to monitor the mother and baby (including creatinine, liver transaminases and platelets), care for pre-term babies, provide caesarean section and blood transfusion if required.
4. Discuss if and when participants would use prophylactic magnesium sulphate in severe pre-eclampsia (even before a fit happens).

Note: During the discussions, explore the current local guidelines and practice, then discuss in light of current evidence.

Station 7.2: Management of a fit in a health facility able to provide Basic Emergency Obstetric Care (BEmONC) (scenario)

Equipment List

- Oropharyngeal airway
- Yankauer sucker
- Spontaneously breathing oxygen mask
- Stethoscope
- Canulae of various sizes
- Syringes
- Giving set
- Intravenous fluid (Ringer's lactate, normal saline)
- Laminated copies of Eclampsia treatment monitoring chart x 4
- Blood sample bottle
- Urinary catheter and bag
- Blood pressure cuff
- Cushions
- Patella hammer
- Pinard's stethoscope
- Urine dipsticks
- Sterile universal container
- Syringes labelled: magnesium sulphate, calcium gluconate, labetolol, hydralazine
- Containers labelled methyldopa, nifedipine

Methodology and approach

One of the facilitators should play the patient. Cushions can be used to simulate pregnancy. The other facilitator should give participants the case history, ask them to repeat back the details and then ask them to manage the patient as if 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 participant and the outcome from those for the facilitator to feedback are listed below. The response to be given by the facilitator to the participant's action is shown. If the participants fail to deliver expected treatment, guide them gently though the process. Other members of the group can act as assistants.

Emphasise that blood pressure and fluid balance management is covered in another station.

Key learning objectives

- To apply the **ABCD** approach to the management of a woman who presents with eclampsia
- To recognise the importance of clinical monitoring of patients on magnesium sulphate
- To consider timing of delivery, the need to transfer and the arrangements for transfer

Instructions

Case History
You are in a BEmOC facility with a woman (primigravida) who is 40 weeks' pregnant who suddenly has a fit. Repeat back these details. You are called. What would you do?

Expected actions

Participant: Suspect eclamptic fit but bear in mind other causes of fit:
- epilepsy
- cerebral malaria
- meningitis
- other intracranial pathology
- diabetes

Call for help

Facilitator: Ask who? And what would you do in the meantime?

Participant: Senior staff or colleagues as available.

Assess **airway**: "Hello, how are you Mrs Tilt?" then assess **breathing**: look for chest movements, listen for breath sounds and feel for breathing.

Facilitator: Breathing is shallow and clear; respiratory rate 28 breaths/minute.

Participant: Participants should say that they are happy with the airway but breathing is very rapid.

Apply oxygen mask.

Facilitator: Comment that this is the right thing to do if oxygen is available. What next

Participant: Assess **circulation** by presence of pulse, colour, blood pressure and assessment of level of consciousness, then put patient in recovery position ensuring left lateral tilt.

Facilitator: Pulse 100 beats/minute, blood pressure 170/95mmHg.

Participant: Get intravenous access and attach intravenous fluids.

Facilitator: Discuss laboratory tests possible in BEmOC facility (usually very limited). Urine dipsticks would be useful.

Ask what should be done next.

Please note that regimen most commonly used is presented here: see notes for facilitators at end of section.

Participant: Give magnesium sulphate intravenously and intramuscularly.

Loading dose:
- IV 4g (as 20% solution) made up to 20ml by adding 8mls of 50% $MgSO_4$ to 12 mls of water for injection or saline slowly over
  10–15 minutes
  AND/OR

- IM 5g to each buttock with 1ml 2% lignocaine (I.M. dose can be given alone if I.V. access not possible)

And start

- Maintenance dose of magnesium sulphate:

- Continue 5g IM with 1ml 2% lignocaine every 4 hours.
  OR
- IV 1g/hour in continuous drip (only safe if infusion pump is available)

Facilitator: Emphasise that if intravenous access cannot be secured then the intramuscular component of the loading dose should still be given. This information should be clearly explained as part of the referral or handover.

Participant: May say that in local setting, IV maintenance can only be used if an infusion pump is available.

Facilitator: What will you do if she has another fit?

Participant: Recurring fit give additional 1-2g IV (lower dose, 1g, if weight less than 70kg).

Facilitator: How long will you continue magnesium sulphate for?

Participant: For at least 24 hours after delivery (if no fits after delivery) or after the final fit if postnatal.

Facilitator: Discuss what vials and percentage concentration of magnesium sulphate is available locally.

Facilitator: how will you monitor this patient and why? After the participants response, discuss the use of the LIVKAN eclampsia monitoring chart.

Participant: **Do not give more magnesium sulphate if**:

- absent knee jerk, or

- urinary output is less than 100ml/4 hours, or

- respiratory rate less than 16 breaths/minute (local guidelines vary on this limit, some state 12 breaths per minute)

- If urine output is <100 mls delay the next dose of Magnesium until 100 mls has been passed. (Magnesium Sulphate is excreted in the urine and will be retained in cases of oliguria, so giving more may lead to toxicity).

(antidote: 10ml 10% calcium gluconate given over 10 minutes IV)

Magnesium sulphate can be safely administered in a BEmONC facility. It is important to monitor patients by checking reflexes. Demonstrate landmarks for knee jerk on a volunteer/facilitator. Practise deep tendon reflexes.

Ensure that all participants can reproduce (verbally or written) the magnesium sulphate protocol that they use. This may be an opportunity to also ask the group to 'design' a wall chart.

Discuss: if you cannot give magnesium because it is unavailable or there is demonstrated toxicity, give diazepam 10 mg rectally or intravenously slowly and a further 10 mg intravenously slowly if convulsions recur. Remember that this may cause respiratory depression and you may need to give rescue breaths until this effect wears off. Diazepam can cause the baby to be floppy when born. Note that diazepam is also sometimes given rectally.

Facilitator: Ask what should happen next.

***Participant**: Assess whether vaginal delivery is likely to proceed quickly or whether need to transfer for caesarean section*

Facilitator: Say if there is an unfavourable cervix, caesarean is likely to be the better option.

Discuss transfer: when to transfer, where to transfer, whose responsibility, whether the woman is accompanied, what to take with her, how to manage further fits on journey, etc. Use the opportunity to discuss the urgency of the case, how long will transfer take in participants' local setting, etc.

Fact box

It is useful to have the background information to hand as different regimens are used all over the world.

Magpie trial

Between 1998 and 2001, more than 10,000 women were recruited into the Magpie trial at 175 hospitals in 33 countries. Eligible if they had pre-eclampsia, defined as: blood pressure ≥ 140/90 mmHg, proteinuria 1^{+} during pregnancy, in labour or up to 24 hours postpartum.

Cochrane review

Risk of eclampsia reduced in women given magnesium sulphate compared with placebo (relative risk 0.41, 95% confidence interval 0.29–0.58).

Risk of placental abruption reduced in women given magnesium sulphate (relative risk 0.64, 95% confidence interval 0.50–0.83).

No increased risk in stillbirth or neonatal death.

Most common regimen used is 4 g loading dose IV slowly over 10–15 minutes followed by:

- 1g IV hourly for 24 hours (Zuspan)
- 10g IM immediately at time of loading dose (4g IV) (Pritchard)

Followed by 5g every 4 hours for 24 hours.

An alternative regimen also sometimes used is:

- 6g loading dose IV (instead of 4g) slowly over 10–15 minutes
- 2g/hour IV maintenance dose (instead of 1g/hour)

Maintenance dose was continued 24 hours after start of treatment or until 24 hours after delivery or until 12 hours after delivery depending on the trial.

Adverse effects: with lower dosage (4 g loading and 1g/hour IV or 10g then 5g 4-hourly IM) adverse effects noted in 25% of women, mainly hot flushes. Most data regarding adverse effects and safety are using this dosage.

Use of higher doses cannot really be supported by data with regard to efficacy and safety.

Note: IM administration of magnesium sulphate is very painful. Give together with lignocaine.

Reference:

L. Duley, A. M. Gülmezoglu, D. J. Henderson-Smart, and D. Chou, “Magnesium sulphate and other anticonvulsants for women with pre-eclampsia,” *The Cochrane database of systematic reviews*, no. 11, pp. CD000025, 2010. Available at: http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000025.pub2/abstract;jsessionid=DEA48730692F4E123EC74210F80F6A95.f02t03

The Cochrane Library [www.thecochranelibrary.com] **or** Hofmeyr GJ, Neilson JP, Alfirevic Z, Crowther CA, Duley L, Gulmezoglu M, *et al*. *Pregnancy and Childbirth: A Cochrane Pocketbook*. Chichester: John Wiley & Sons; 2008 (ISBN 978-0-470-51845-8).

Station 7.3: Management of a fit in a Comprehensive Emergency Obstetric Care (CEmONC) facility (scenario)

Equipment List

- Oropharyngeal airway
- Yankauer sucker
- Spontaneously breathing oxygen mask
- Stethoscope
- Canulae of various sizes
- Syringes
- Giving set
- Intravenous fluid (Ringer's lactate, normal saline)
- Blood sample bottle
- Laminated copies of Eclampsia treatment monitoring chart x 4
- Urinary catheter and bag
- Blood pressure cuff
- Cushions
- Patella hammer
- Pinard stethoscope
- Urine dipsticks
- Sterile universal container
- Syringes labelled: magnesium sulphate, calcium gluconate, labetol, hydralazine
- Containers labelled methyldopa, nifedipine

Methodology and approach

One of the facilitators should play the patient. Cushions are provided to simulate pregnancy. The other facilitator should give participants the case history, ask them to repeat back the details and then ask them to manage the patient as if 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 participant and the outcome from those for the facilitator to feedback are listed below. If the participants fail to deliver expected treatment, guide them gently though the process. Other members of the group can act as assistants. Encourage team work.

Please note that the dose and routes of administration of magnesium sulphate may vary from country to country and even between hospitals and clinics. The participant should be expected to know what is done in their own institution and to describe that regimen.

Participants should be made aware of the correct dosage for intramuscular and intravenous administration if they do not have this knowledge.

Treatment of hypertension and fluid management in a woman with eclampsia are covered in **Station 4.4**.

For facilitator notes on the use of magnesium sulphate, please refer to **Station 4.2**.

Key learning objectives
■ To apply the **ABCD** approach to assess a patient with an eclamptic fit.
■ To know the dose and method of administration of magnesium sulphate.
■ To be able to develop a management plan
■ To consider timing and method of delivery
■ To understand and apply a monitoring schedule for a patient who has eclampsia
■ To practice deep tendon reflexes.

Instructions

Case History

You are in a CEmONC facility. A 26-year-old primigravida woman at 36 weeks gestation, who is on the antenatal ward with a diagnosis of pre-eclampsia, complains of abdominal pains then suddenly has a fit. Repeat back these details. You are called. What would you do?

Expected actions

Participant: Suspect eclamptic fit but bear in mind other causes of fit.

Facilitator: Ask participant to list other causes.

Participant: Answers:
- epileptic fit
- eclamptic fit
- cerebral malaria
- meningitis
- other intracranial pathology
- diabetes

Facilitator: What do you do?

Participant: Call for help and do a left lateral tilt

Participant:

Assessment of **airway and breathing**; "Hello, how are you Mrs Tilt?". Look for chest movements, listen for breath sounds, listen and feel for breathing.

Facilitator: **Breathing** is shallow, respiratory rate 28 breaths/minute.

Participant: Participants should say that they are happy with the airway but breathing is very rapid. Apply oxygen mask.

Facilitator: Comment this is the right thing to do if oxygen is available.

Participant: Assess **circulation** by presence of pulse, colour, assessment of level of consciousness and blood pressure.

Facilitator: Pulse 110 beats/minute, blood pressure 170/120 mmHg.

Participant: Get intravenous access, send bloods and attach intravenous fluids.

Facilitator: Send bloods for what? Useful tests would be full blood count (platelets), urea, creatinine, liver function tests, if available. Discuss what tests can be performed locally and how long before results are available.

Participant: Give magnesium sulphate intravenously and intramuscularly.

Immediate dose:
Most common regimens are:

- 4g loading dose IV slowly over 10–15 minutes,

Immediately followed by:

- 1g IV hourly for 24 hours (If infusion pump available. If not, it is unsafe to give Magnesium by I.V. infusion)
  OR
- 10g IM immediately at time of loading dose
- followed by 5g every 4 hours for 24 hours
  OR
- 6g loading dose IV instead of 4g slowly over 10–15 minutes
- 2g/hour IV maintenance dose instead of 1g/hour IV (rarely used regime)

Maintenance dose continued 24 hours after start of treatment or until 24 hours after delivery or until 12 hours after delivery or until after the last fit if it occurs postnatally.

Ensure that the patient is in the recovery position if level of consciousness is not alert.

Facilitator: What are the adverse effects of giving magnesium sulphate?

Participant: With lower dosage (4g loading and 1g/hour IV or 10g then 5g 4-hourly IM), adverse effects noted in 25% of women, mainly hot flushes.

Facilitator: What do you do if fit recurs?

Participant: Give additional 1-2g IV (lower dose, 1g, if weight less than 70kg).

Note:

1. Some health care providers may give diazepam for a recurrent fit.
2. In some settings, intravenous diazepam is still given and not magnesium sulphate. Explain that Magnesium Sulphate is now considered the drug of choice because of the results of trials demonstrating improved outcomes and reduced deaths.

Facilitator: When do you stop magnesium sulphate? After the participants response, discuss the use of the LIVKAN eclampsia monitoring chart (note that this may have been discussed in detail with the group at the previous station)

Participant: Do not give magnesium sulphate if any of the following are present:

- absent knee jerk (knee jerks easy to elicit in eclampsia and pre-eclamptic toxaemia, so if you are not able to elicit they are very likely absent)
- urinary output is less than 100 ml/4 hours

- respiratory rate less than 16 breaths/minute (or according to local guidelines)

Facilitator: What should be done for this patient?

Participant: In this case, the baby must be delivered once the patient is stable, delivery is recommended by 12 hours at the latest following an eclamptic convulsion.

Facilitator: How would you decide on mode of delivery?

Participant: Expected to say will assess patient with regard to obstetric examination, fetal condition, vaginal examination to assess cervix and descent of head (if cephalic)

Facilitator: Stress the need for treatment of hypertension (covered in another station). Try to deliver within 12 hours. Explain the need to stabilise the mother before CS or induction of labour.

Stress the need to continue magnesium for 24 hours after delivery or 24 hours after the last fit, whichever is the most recent event.

Stress the importance of a member of staff staying with the patient to ensure the airway remains open.

Discussion points

- Explain that the antidote to magnesium sulphate toxicity is 10 ml 10% calcium gluconate given slowly (over 10 minutes) intravenously.
- Consider the timing of delivery of the baby. Assess the risks to mother, pregnancy and cervix and decide whether vaginal delivery or caesarean section is indicated. A vaginal delivery is advised if there is no maternal risk, no obstetric contraindication and the cervix is favourable. Caesarean section is advised if there are repeated fits, maternal risk, foetal distress, or an unfavourable cervix.
- Can a midwife give magnesium sulphate immediately when there is no doctor? Do they have to have authorisation first? Midwives should be able to give intravenous and intramuscular magnesium sulphate immediately without waiting for authorisation.
- If you cannot give magnesium because it is unavailable or there is toxicity give diazepam 10 mg rectally or intravenously slowly. Remember that this may cause respiratory depression in the neonate or mother and you may need to give rescue breaths until this effect wears off. Intravenous diazepam is also painful, so diluting it with saline or water for injection is advisable. If the mother has had diazepam, the baby can be floppy and lack tone when it is born.
- Discuss the need for good monitoring charts: blood pressure, pulse, reflexes, urine output, urine protein, fluid intake.
- It is very important to stress the need for careful monitoring and use of an appropriate chart, with regular observations, in a high-dependency area where available. Note that such a high-dependency area will often simply be in an identified corner of the labour ward.

- Discuss the importance of fluid restriction. Remember the blood vessels become “leaky” in severe pre-eclampsia and if fluids are not restricted there is a risk of cerebral or pulmonary oedema.
- Discuss the importance of a full head-to-toe examination, looking for other organ/system involvement.
- Discuss the most common subsequent complications
    - Pulmonary oedema
    - Untreated hypertension and cerebrovascular accident
    - HELLP syndrome
    - D&C

Station 7.4: Control of blood pressure and fluid balance (workshop)

Equipment List
■ Flipchart and pens or blackboard and chalk ■ Normal saline 500mls infusion x1 ■ Any dextrose infusion 500mls x1 ■ Syringes labelled: labetol, hydralazine ■ Containers labelled methyldopa, nifedipine

Methodology and approach

This is a closed discussion; the discussion takes place with the facilitator as the focus and retaining the direction of the discussion.

It is important to emphasise the need for antihypertensive treatment, the consequences of uncontrolled blood pressure and the avoidance of precipitous falls in blood pressure.

During this station, knowledge of drugs and doses is acquired. It is important to emphasise the need for controlled fluid input and meticulous fluid balance. This discussion is restricted to the management of hypertension during labour, delivery and the postpartum period and does not cover hypertension in the antenatal period. Ensure all participants are involved.

Key learning objectives
■ To discuss appropriate drug treatment for hypertension associated with pre-eclampsia and eclampsia. ■ To learn how to monitor fluid balance in a patient with pre-eclampsia or eclampsia. ■ To be able to recognize the signs and symptoms of: – Pulmonary oedema – Cerebrovascular accident – HELLP syndrome

Instructions

Start with the question: Why is it important to treat hypertension?

Discussion points

Antihypertensive treatment

1. Start antihypertensive treatment if diastolic is greater than 110 mmHg or systolic greater than 170 mmHg.

Uncontrolled blood pressure can cause raised intracranial pressure, intracranial haemorrhage and heart failure.

Discuss use of antihypertensive drugs including:

- **hydralazine**
  5 mg intravenously over 3–4 minutes. If intravenous not possible give intramuscularly. If diastolic remains above 90 mmHg, repeat dose at 30-minute intervals until diastolic blood pressure is less than 90 mmHg. Do not give more than 20 mg in total. Discuss use of hydralazine in an intravenous drip: dosage, protocol.
- **labetalol**
  10 mg intravenously. If response is inadequate after 10 minutes, give 20 mg intravenously. Increase dose to 40 mg and then 80 mg if satisfactory response not obtained 10 minutes after each dose. Maximum dose: 300mg. Cautious use; contraindications: asthma and bradycardia. Do not use concurrently with calcium channel blockers such as nifedipine.
- **nifedipine**
  5 mg orally. If response is inadequate after 5 minutes, give additional 5 mg. Can cause headaches; patient may already have headache from pre-eclampsia. Sublingual nifedipine is no longer recommended due to the risk of a precipitous decline in BP and consequent fetal distress.

2. What is a 'satisfactory response' and what are the dangers of a sudden precipitous drop in BP?

3. Which antihypertensives are available locally and are there protocols/guidelines in place for use?

Monitoring a patient with pre-eclampsia/eclampsia

4. Get participants working to design a monitoring chart for a woman with eclampsia or severe pre-eclampsia and discuss what will be monitored and how often.

Causes of death in women with pre-eclampsia or eclampsia

Answers should be:

- Convulsion with prolonged hypoxia
- High blood pressure may cause cardiovascular accident
- Cerebral oedema
- Respiratory problems: pulmonary oedema, aspiration, airway obstruction
- Haemorrhage: placental abruption, disseminated intravascular coagulation
- Liver problems: rupture, HELLP
- Renal failure
- Venous thrombo-embolism
- Magnesium sulphate toxicity (this can be avoided by adherence to the treatment guidelines and protocol)

Fact box Antihypertensive drugs

Hydralazine	Intravenous treatment: • Administer 5 mg IV, slowly. • Repeat every fifteen minutes until the blood pressure goal has been achieved. • Repeat hourly as needed or give 12.5 mg IM every two hours as needed.
Labetalol	Oral treatment: • Administer 200 mg. • Repeat dose after one hour until the treatment goal is achieved. • The maximum dose is 1200 mg in 24 hours. Intravenous treatment: • Administer 10 mg IV. • If response is inadequate after 10 minutes, administer 20 mg IV. • The dose can be doubled to 40 mg and then 80 mg with 10-minute intervals between each increased dose until blood pressure is lowered below threshold. • The maximum total dose is 300 mg; then switch to oral treatment. Note: Women with congestive heart failure, hypovolaemic shock or predisposition to bronchospasm (asthma) should not receive labetalol.
Nifedipine immediate-release capsule	Oral treatment: • Administer 5–10 mg orally. • Repeat dose after 30 minutes if response is inadequate until optimal blood pressure is reached. • The maximum total dose is 30 mg in the acute treatment setting
Alpha methyldopa	Oral treatment: • Administer 750 mg orally. • Repeat dose after three hours until the treatment goal is achieved. • The maximum dose is 3 g in 24 hours.

Fact box **Fluid balance**

Uncontrolled fluid balance can cause fluid overload, with consequent raised intracranial pressure, cerebral and pulmonary oedema.

- Catheterise and keep fluid balance input–output chart. Fluid input should not exceed output by more than 1 litre in 24 hours. Limit fluid input a maximum of 80 mls per hour, and less if urine output is low. A regime of 40 mls per hour plus previous hour's urine output is recommended. Remember in most cases oliguria is due to the disease and giving extra fluid will not solve this but rather risks causing pulmonary and cerebral oedema.
- Emphasise that the patient should be kept 'on restricted amounts of fluid' to avoid cerebral oedema and respiratory failure. If you have access to laboratories then take daily urea and electrolyte measurements. It is not necessary to fluid load.
- In the immediate post-delivery period, there will often be a degree of oliguria. Natural diuresis usually occurs around 36–48 hours following delivery. There is a risk of iatrogenic fluid load so careful fluid balance is required. The total fluid that should be given is 80ml/hour.
- Urine output should be recorded hourly and it is not necessary to be aggressive in maintaining urine output at this stage.

Note:

- Intravenous fluids will **not** cause hypertension.
- Intravenous normal saline or Ringer's lactate will **not** cause hypertension.
- 2 ml/minute is almost 1 litre in 8 hours or 20 drops/minute. Even this is too much!

Using a treatment monitoring chart

- Hourly monitoring and documentation
- Vital signs and medications
- Summary of treatment guidelines
- Discharge summary
- Can be used to audit care

LIVKAN Eclampsia/Severe pre-eclampsia treatment monitoring chart

Name:_____**Gravida:**_____**Para**_____

___

Date: _____ **Hospital No.:**_____

___Age:_____

Hours		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Time																									
FHR (/min)																									
Blood pressure (mmHg) and pulse (/min.)	**250**																								
	240																								
	230																								
	220																								
	210																								
	200																								
	190																								
	180																								
	170																								
	160																								
	150																								
	140																								
	130																								
	120																								
	110																								
	100																								
	90																								
	80																								
	70																								
	60																								
Hydralazine																									
Nifedipine																									
Labetolol																									
Number of fits (convulsions)	**10**																								
	9																								
	8																								
	7																								
	6																								
	5																								
	4																								
	3																								
	2																								
	1																								
	0																								
Level of consciousness	**A**																								
	V																								
	P																								
	U																								
Urine proteinuria	**4+**																								
	3+																								
	2+																								
	1+																								
Input (mls)																									
Output (mls)																									
Respiratory rate																									
Deep tendon reflex																									
MgSO4 dose																									
MgSO4 route																									
Antidote Ca gluconate																									

Deep Tendon Reflex: A: absent, B: Brisk, D: Diminished:

PLEASE DETERMINE URINE OUTPUT, DEEP TENDON REFLEX AND RESPIRATORY RATE PRIOR TO THE NEXT DOSE OF MAGNESIUM SULPHATE

Magnesium Sulphate Regimen

Treatment

1. Loading dose:

   a. 4grams I.V SLOWLY OVER 15 minutes (8mls of 50% MgS04 +12mls of water for injection or normal saline

AND (If unable to give IV, give IM loading dose only)

   b. 10grams: I.M 5gm in each buttock (10mls of 50% MgS04 + 1ml of 2% Xylocaine in the same syringe, into each buttock)

2. Maintenance dose:

   a. I.M MgSO4 5gm 4 hourly (alternating buttock)

   OR

   b. 10 gram MgS04 in 1000mls of Normal saline or Ringers lactate at rate of 100mls per hour (1gram)

Duration of treatment

- 24 hours after last fit/convulsion
- 24 hours after delivery

Treatment of recurrent fits

1-2 grams of MgSO4 I.V slowly (Please make up to 20% solution before use)

Blood pressure control

Hydrallazine: Administer IV hydrallazine 5mg slowly over 10 minutes if BP is greater or equal to 160/110mmHg. Repeat 5mg every 20mins up to a maximum of 20mg, if diastolic BP still equal to or greater than 110mmHg.

Nifedipine: BP >160/110 mm Hg: 10 mg PO initial; repeat dose may be administered in 30 min prn

Labetolol: BP >160/110 mm Hg: 20 mg IV bolus; subsequent doses of 40 mg followed by 80 mg IV may be administered at 10- to 20-min intervals to achieve BP control; may also be administered as continuous infusion 1 mg/kg/h

Monitoring of MgSO4

Do not administer MgSO4 if:

- Deep tendon reflexes is diminished or absent
- Respiratory rate is less than 15/min
- Urine output is less than 25/hour

Delivery

- Aim for delivery within 12hours of admission
- **Caesarean section**: Fetal distress, patient with unfavorable cervix, vaginal delivery not possible
- **Vaginal delivery:** No fetal distress, No cephalopelvic disproportion, cervix is favourable

Intravenous fluid therapy

USE

- Normal saline or Ringers lactate: 1ml/kg/hr or 80mls/hr

AVOID

- 5% Dextrose and Dextrose saline infusion

Antidote to MgSO4

1gram (10mls) of 10% Calcium gluconate IV slowly (over 10 minutes)

Patient discharge summary notes completed on / /201

Number of convulsions before admission:_____

Date of Admission_____

Date of Delivery_____

Maternal Outcome (Alive/Dead)_____

Fetal Outcome (Alive/Dead)_____

Date of Discharge or Death (Please specify)_____

Mode of Delivery: (SVD ☐ C/S ☐ Vacuum ☐ others please specify_____

Complications on Admission: _____

_____

Complications on Discharge:_____

MODULE 8: OBSTETRIC HAEMORRHAGE

Station 8.1: Volume replacement (workshop)

Equipment List

- Flipchart/white boards and pens or blackboard and chalk
- Bath towels x 4 (or any local material used during labour to mop/clean up blood
- Swabs of various sizes
- A sanitary pad
- Incontinence pads
- 3 kidney dishes
- Laminates with Blu-tac® saying 'not much to show' and 'going to die'
- Plastic water bottles, 0.5-litre x 10
- 3 litres clear or red washing up liquid
- Red food dye
- Instant coffee granules
- Bucket or large bowl

Key teaching points

This is a session for demonstration and discussion. It is very important to emphasise the importance of recognition of hypovolaemia, the levels at which observed losses should be corrected and how this should be done

Key learning objectives

- To be able to estimate blood loss correctly
- To be able to correlate blood loss with clinical signs
- To appreciate the severity of various volumes of blood loss
- To learn the principles of fluid and blood replacement for women with hypovolaemia

Emphasise that a fall in blood pressures is a LATE sign.

For a patient who has lost 1.5 litres things do not look too bad clinically so it is very easy to underestimate the amount of blood lost. The clinical picture can be deceiving unless you are aware of how much blood has been lost. This will now be demonstrated. Ask participants if they have ever been a blood donor and then ask those who have if they noticed any change after giving 500 mls of blood. Usually, they won't have noticed anything.

Fact Box **Recognition of Hypovolaemia**

Circulating volume lost	Signs
Up to 500 ml (1 bottle)	No symptoms or signs
1.5 litres (3 bottles)	Increase in pulse and respiratory rate, cold, pale
2 litres (4 bottles)	Increase in pulse and respiratory rate, only now fall in blood pressure, cold, clammy, agitated
Over 2 litres (>4 bottles)	Rapid pulse and respiratory rate, low blood pressure, cold, clammy, confused, agitated, aggressive or drowsy

Method of demonstrating

In advance of the session:

Make up fake blood in the bucket by mixing 3 litres of washing up liquid (or water if washing up liquid not available) with enough red food die and coffee granules to give the appearance of blood.

Make a display out of swabs and pads soaked with different amounts of fake blood, varying from 50 mls to 1 litre. Also, fill a kidney dish with 400 mls of the fake blood. Keep a record of how much blood is in each specimen. Leave the residual in the bucket as part of the display.

Label each specimen with a letter and ask participants to note down how much they fluid they think is in each sample. Then ask each of them, in turn, to say how much they think is in each sample. You will notice quite a wide variation. Usually, the greater the volume, the wider the variation in opinion.

Use this exercise to emphasise how bad we tend to be at estimating blood loss, especially large losses. Point out that in real life the situation may be further confounded by the fact that patients may have bled at home before arrival and also that loss can be partly or completely concealed within the uterus and abdomen. We, therefore, need to use the patient's vital signs to help us interpret how much blood has been lost, especially in major haemorrhages.

Fill ten half-litre bottles with water. Pour three (1.5 litres) onto the towel and pass the towel round and ask participants to guess how much liquid is contained in the towel afterwards, point out that it does not feel soaking wet but the patient has lost 1.5 litres (25-30% of blood volume): at this level, her blood pressure has not dropped, so it is easy (because towel does not feel soaked) to fail to recognise she has lost 25-30% of blood volume unless close attention is paid to her pulse and respiratory rate. Discuss how changes in vital signs will develop sooner if the patient has been anaemic to start with.

Demonstrate how, from that point, things go on to deteriorate rapidly by lining bottles up in groups of three, then two, then five. Under the group of three, put the laminate 'not much to show' and under the next two put 'going to die'. Emphasise that blood loss is a dynamic process, and that loss can increase quite rapidly. At term, the blood flow to the uterus is 700 mls/minute, and normal term blood volume is around 6 litres.

Draw the following sets of observations on a flip chart and ask participants to estimate blood loss in each case:

Patient 1	Observations
Respiratory rate	28/minute
Pulse	110/minute
BP	115/75
Conscious level	Alert

Answer: between 1500 mls-2000 mls

Patient 2	Observations
Respiratory rate	38/minute
Pulse	160/minute
BP	65/30
Conscious level	Responds to pain

Answer: >2500 mls

Patient 3	Observations
Respiratory rate	20/minute
Pulse	80/minute
BP	120/80
Conscious level	Alert

Answer: < 700 mls

Patient 4	Observations
Respiratory rate	35/minute
Pulse	120/minute
BP	90/60
Conscious level	Alert

Answer: About 2000 mls.

Explain that patients 1 and 3 are not shocked, so it is likely that they have each lost less than 2000 mls as BP tends not to fall until the loss is greater than 2000 mls unless the patient is anaemic.

Intravenous fluids

Intravenous fluids should normally be given when losses amount to 700 ml; that is, 15% of circulating blood volume, at which level subtle or no signs of hypovolaemia will be apparent.

In the presence of hypovolaemia and the absence of pre-eclampsia or heart failure (anaemia) intravenous fluids can be infused rapidly to keep pace with losses and until you are sure the patient is no longer bleeding, or until blood for transfusion becomes available. It is generally best to limit rapid infusion of fluid to 3 litres of clear fluid before giving blood to avoid fluid overload and pulmonary oedema, but this must be balanced against the patient's vital signs and the timing of availability of the blood for transfusion.

Crystalloids should be given initially and infused rapidly.

Blood

If available, **blood should be given when maternal losses exceed 2 litres**; that is after 33% of circulating blood volume has been lost.

Blood should be warmed, even in hot countries, by holding it against your own body (or using a blood warmer).

The rate of giving blood depends on how much the patient has lost and whether she is still bleeding (you must identify the reason for bleeding and stop it).

Stress that, if blood is not available, it is very important to continue with fluid resuscitation to maintain BP at more than 50 systolic. If the systolic BP is <50 mm Hg then the tissues cannot be perfused with oxygen. Adequate fluid resuscitation can be life-saving.

Recap

- 1.5 litres lost and no longer bleeding – needs IV – give fluids reasonable quickly
- 2 litres lost and no longer bleeding – needs IV and run fast, and prepare for blood transfusion
- If still bleeding run fast, according to signs and symptoms (see below)
- Monitor respiratory rate, heart rate, blood pressure and other clinical signs for adequacy of replacement

The need for blood should be balanced against the hazards of giving blood, the most important of which are infections (HIV and Hepatitis B and C) and transfusion reactions. If losses exceed 2 litres and the patient is not given blood, she is very likely to die. Remember that haemorrhage is the most common cause of maternal death. A blood transfusion might prevent this.

Note: Participants may recall an experience locally where, in women with anaemia, symptoms occur earlier with relatively less blood volume loss.

Discussion points

- Often too little blood given too late
- Fluid resuscitation in a patient with severe pre-eclampsia who is bleeding
- Sizes of canulae

- Refer back to points in station 4.1: How is blood given? With furosemide? With antimalarials (in absence of packed cells, fresh frozen plasma, etc.)?
- Discuss whether there is access to fresh frozen, dried or freeze-dried plasma.

Station 8.2: Postpartum haemorrhage: atonic uterus (workshop)

Equipment List

- Flipchart/white boards and pens or blackboard and chalk
- Rusch balloon (Foley catheter with a condom to improvise balloon tamponade)
- Pictures/posters of bimanual compression, aortic compression and B-Lynch suture
- Post-partum fabric uterus and placenta

Key teaching points

This is a closed discussion: the discussion takes place with the facilitator guiding the discussion. It is important to emphasise the factors predisposing to atonic uterus. During this station knowledge of oxytocic drugs, their dosages and method of administration is acquired by the participants. They must also acquire knowledge of compression and tamponade techniques.

Key learning objectives

- To recognise the signs and symptoms of uterine atony.
- To discuss the prevention of postpartum haemorrhage (PPH).
- To discuss the various drugs used in the management of uterine atony.
- To acquire knowledge of compression and tamponade techniques.

Instructions

Facilitator: How do we define PPH?

Participant: Bleeding from the lower genital tract of 500 ml and above after delivery. If within the first 24 hours it is primary PPH and if after 24 hours but within 6 weeks, it is secondary.

Facilitator: What are the problems with this definition?

Participant: Answers:

- □ difficulty in estimating blood loss
- □ in some women, blood loss of less than 500ml may result in a significant physiological change such as increased pulse and later on low blood pressure, which threatens the woman's life; for example, women with severe anaemia presenting in labour.

Facilitator: What are the causes of PPH?

Participant: 4T's, Tone, tissue, tears, thrombin

Facilitator: What is the most common cause of PPH?

Participant: Answer: atonic uterus

Facilitator: How can we recognise uterine atony?

Participant: Responses:
- □ Uterus fails to contract after delivery.
- □ The uterus is soft, boggy and poorly contracted.
- □ If the uterus is not palpable at all in the abdomen, consider uterine inversion.

Facilitator: Can we predict women who are at risk of PPH?

Participant: In some cases but in most cases not predicted.

Facilitator: Briefly discuss why and give suitable examples

Facilitator: What conditions or factors may increase the risk of PPH? Invite participants to record these on flipchart/blackboard.

Participant: Responds:
- □ antepartum haemorrhage
- □ prolonged labour
- □ distended uterus; large baby, polyhydramnios, multiple pregnancy, grand multiparity, fibroid uterus
- □ retained products of conception
- □ beware of a full bladder

Facilitator: How can we prevent PPH?

Participant: Labour:
- □ Avoid prolonged labour by using the partograph
- □ active management of third stage of labour, which is:
  - oxytocic after delivery
  - controlled cord traction when signs of placental separation
- □ institute early breastfeeding when appropriate

Facilitator: What is the management of PPH with an atonic uterus?

Participant: Responds:
- □ empty the bladder
- □ Encourage breast feeding
- □ check for placental completeness
- □ give oxytocic drug
- □ massage uterus

Discuss the various oxytocic drugs available, their use and dosages, methods of administration, and so on.

Note: Late cord clamping (performed after 1 to 3 minutes after birth) is recommended for all births while initiating simultaneous essential newborn care.

It may be helpful to ask participants to compile a table of the oxytocic drugs available to them and then discuss how these are used in their own setting. Compare their table with the fact box below.

Fact Box **Oxytocic Drugs**

Drug	Dose	Further doses	Maximum dose	Cautions
Oxytocin	IM; 10 units IV: 5 units slowly	IV; infuse in crystalloid at 10 units/hour (30-40 IU/l500 mls)	Avoid >3 litres of fluid contain oxytocin	IV bolus
Ergometrine/ methylergometrine	IM (0.5mgms) or IV; 0.2 mg	Repeat iv dose after 15 minutes and if necessary every 4 hours	Total 1.0 mg	Hypertension, pre-eclampsia, heart disease
Prostaglandin F_2 (Carboprost®)	IM; 0.25 mg	Repeat dose ever 15 minutes	Total 2.0 mg (8 doses)	Asthma, do not give IV
Prostaglandin E_1 Analogue (misoprostol)	Per rectal or sublingual; 600-800 micrograms			Adverse effects include vomiting, pyrexia and diarrhoea. These are more common with the sublingual route.

Facilitator: If bleeding continues despite above treatments, what can be done next?

Participant: Responds:

- □ Bimanual compression (ask participants to explain how this is done)
- □ Aortic compression.
- □ Examine for perineal tears and cervical tears (how, where?).
- □ Patient may need examination under anaesthesia with:
  - – removal of placenta (remnants)
  - – repair of cervical and perineal tears
  - – packing of the uterus
  - – balloon tamponade (Condom catheter or other, e.g. Rusch balloon).
- □ Patient may require laparotomy with:
  - – compression suture of the uterus (B-Lynch)
  - – subtotal hysterectomy.

NB: Bear in mind consumption coagulopathy with large losses. Clotting factors are lost along with red blood cells. The best treatment is fresh whole blood or fresh frozen plasma if available. It is harder to stop blood loss in the presence of a coagulopathy.

Notes

Prostaglandin analogues, such as Carboprost, are unlikely to be available in many resource-poor countries. If available, Prostaglandin F_2 may also be given I.M.

Misoprostol is not yet licensed for use in the treatment of postpartum haemorrhage in all countries – Please refer to WHO and FIGO guidelines. FIGO recommendations state that a single dose of 600micrograms orally can be given for the prevention of PPH in settings where oxytocin is not available. Trials are ongoing to assess effectiveness for PPH and whether could be second-line therapy in women who have contra-indications to ergometrine.

Tranexamic acid (1 gram IV slowly) should be given in cases of major PPH and has been shown to be very effective in saving lives when given within 3 hours following birth. The dose may be repeated within 30 minutes if the loss has not settled or if bleeding recommences within 24 hours.

Demonstrate how to make a condom catheter balloon. Tie a condom over the end of a Foley catheter below the holes. Have an IV infusion bag attached to a giving set with fluid run through. Attach the giving set to the Foley catheter (to where urine normally drains out from) and run fluid in until condom contains approximately 500 mls fluid. Explain that in cases of atonic uterus a balloon may be filled to approximately 800-900 mls in order to apply sufficient tamponade pressure to the placental bed to stop the bleeding.

References

1. Woman Trial Collaborators (2017) Effect of early tranexamic acid administration on mortality, hysterectomy and other morbidities in women with post-partum haemorrhage (WOMAN): an international, randomized, double-blind, placebo-controlled trial. **Lancet** 389:2105-16
2. World Health Organization (2012): WHO recommendations for the prevention and treatment of postpartum haemorrhage

Station 8.3: Placental abruption (scenario)

Equipment List	
■ Oropharyngeal airway	■ Intravenous fluid (Ringer's lactate, physiological saline)
■ Yankauer sucker	■ Blood sample bottles
■ Spontaneously breathing oxygen mask	■ Urinary catheter
■ Stethoscope	■ Blood pressure cuff
■ Cannulae of various sizes	■ Pinard stethoscope
■ Syringes	■ Cushions
■ Giving set	

Key teaching points

One of the facilitators should play the patient. Cushions are provided to simulate pregnancy. The other facilitator should give participants the history, ask them to repeat back the details and then ask them to deal with the patient as if in real life. Point out to the participants that there is equipment available on an adjacent table. The expected actions of the participants are listed below. The responses to be given by the facilitator to the participants' actions are shown. If the participants fail to deliver expected treatment, guide them gently through the process. Other members of the group can act as assistants. Remember to encourage teamwork.

Key learning objectives
■ To recognise and diagnose placenta abruption.
■ To practice resuscitation and management of a woman with placental abruption.
■ To be aware that postpartum haemorrhage may follow placental abruption.

Instructions

History

A 22-year-old multiparous woman who is 36/40 weeks pregnant is admitted bleeding from the vagina. She is very pale and drowsy. She is complaining of severe constant abdominal pain. Repeat back these details. You are called. What would you do?

Expected actions

Participant: Call for help.

Facilitator: Ask who?

Participant: Senior people available.

Participant: Assess **airway**; "Hello, how are you, Mrs Tilt?" Look for chest movements, listen for breath sounds, listen and feel for breathing.

Facilitator: Breathing shallow and clear, respiratory rate 30 breaths/minute.

Participant: Participants should say that they are happy with airway but the **breathing** is very rapid.

Apply oxygen mask.

Facilitator: Comment that this is the right thing to do if oxygen is available.

Participant: Assess **circulation** by presence of pulse, colour, assessment of level of consciousness and blood pressure.

Facilitator: Pulse 120 beats/minute, blood pressure 85/65 mmHg.

Participant: Get intravenous access: insert two large cannulae and send bloods and attach intravenous fluids.

Facilitator: Send bloods for what? Which IV fluids are available/useful?

Facilitator: What do you want to do next?

Participant: Secondary survey to find the cause for the problem, palpate abdomen.

Facilitator: The uterus is rigid and feels hard.

Participant: Suspect placental abruption and major concealed haemorrhage.

Facilitator: [Lead participant to this conclusion if necessary.]

Facilitator: What will you do now?

Participant: Vaginal examination.

Facilitator: is the cervix is 6cm dilated with an absent foetal heartbeat beats/minute.

Participant: Decision to wait and deliver vaginally.

Facilitator: Conversation to the effect that labour often proceeds quickly. Then say that, unfortunately, a stillborn baby was delivered after two hours and the mother immediately bleeds 1.5 litres of blood with clots and continues to 'trickle'.

Participant: Assess **ABCD** again.

Facilitator: Respiratory rate 28/minute, Pulse 120 beats/minute, blood pressure 80/60mmHg and uterus atonic.

Participant: Rub up a contraction. Give an oxytocic.

Facilitator: Ask participants which one and how much.

Participant: Transfuse whole (fresh blood is preferable) as soon as possible, if available.

Facilitator: Uterus contracts down and bleeding stops.

Discuss point that this patient may develop disseminated intravascular coagulation.

Will need to monitor patient intensively for at least 24 hours – fluid input/output, bleeding, etc.?

Discussion points

- It is very important to recognise placental abruption as soon as possible. This is very much a clinical diagnosis. Check placenta for retroplacental clot after delivery – this confirms abruption. (Any retro-placental clot is blood that has already been lost from the maternal circulation at the time of the abruption)
- The problem of incorrectly thinking that the baby is alive because raised maternal pulse (tachycardia) is auscultated in the abdomen and confused for the fetal heartbeat.
- Discuss whether stillbirth can be avoided in cases of abruption:
  - In CEmOC – Would caesarean section be performed by participants?
  - In BEmOC – Caesarean section not possible – could anything have been done?

Station 8.4: Placenta praevia (scenario)

Equipment List

- Oropharyngeal airway
- Yankauer sucker
- Spontaneously breathing oxygen mask
- Stethoscope
- Cannulae of various sizes
- Syringes
- Giving set
- Intravenous fluid (5% dextrose, Ringers lactate, physiological saline)
- Blood sample bottles
- Urinary catheter
- Blood pressure cuff
- Pinard's stethoscope
- Cushions

Key teaching points

One of the facilitators should play the patient. Cushions are provided to simulate pregnancy. The other facilitator should give participants the history, ask them to repeat back the details and then ask them to deal with the patient as if 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 are listed below. The response to be given by the facilitator to the participants' actions is shown. If the participants fail to deliver expected treatment, guide them gently though the process. Other members of the group can act as assistants. Encourage teamwork.

Key learning objectives

- To recognise and diagnose placenta praevia.
- To practise resuscitation and management of a woman with placenta praevia.

Instructions

History

A 25-year-old woman in her second pregnancy arrives at your CEOC with a history of intermittent bleeding over the last couple of days. She is about 36 weeks of gestation. She starts to bleed profusely vaginally. She suddenly collapses. Repeat back the details. You are called. What would you do?

Expected actions

Participant: Call for help.

Facilitator: Ask who?

Participant: Senior people available.

Participant: Assess **airway**: "Hello, how are you, Mrs Tilt?" Look for chest movements, listen for breath sounds, listen and feel for breathing.

Facilitator: Breathing is shallow and clear, respiratory rate 35 breaths/minute.

Participant: Participants should say that they are happy with the airway but **breathing** is very rapid.

Apply oxygen mask.

Facilitator: Comment that this is the right thing to do if oxygen is available.

Participant: Move quickly to assess **circulation** by the presence of a pulse, colour, assessment of the level of consciousness and blood pressure.

Facilitator: Pulse 130 beats/minute, blood pressure 80/60 mmHg, the patient responds to pain.

Participant: Get intravenous access: insert two large cannulae and send bloods and attach intravenous fluids.

Facilitator: Send bloods for what?

Participant: A full blood count. Need to crossmatch blood urgently, at least 2 units.

Participant: Site two large bore cannulae, give fluids immediately.

Facilitator: What type of fluids available? How fast would participants run fluids?

Palpate abdomen

Facilitator: Uterus is soft and not tender. What is the most likely diagnosis?

Participant: Placenta praevia

Facilitator: What other findings on examination may lead you to this diagnosis?

Participant: Expected answers:

- □ If cephalic, head may be free and mobile
- □ Maybe a malpresentation: breech, transverse lie, oblique lie
- □ Foetal heart rate may be Tachycardic (>160/minute)

Facilitator: How can the diagnosis be confirmed?

Participant: Ultrasound scan.

NB if a portable scan is not available it is likely to cause a dangerous delay by sending a patient for a scan in another part of the hospital.

Facilitator: Discuss examination in theatre: speculum but not vaginal examination unless ready to proceed to caesarean section. Note that the practice of examination under anaesthesia is no longer recommended.

What is it important **not** to do?

Participant: Do not perform a digital vaginal examination if praevia strongly suspected (may only consider it in an operating theatre under controlled conditions if no other option for diagnosis available).

Facilitator: Lead the discussion surrounding delivery: when would participants deliver the baby?

Participant: In the current scenario, delivery should be immediate, as the woman is bleeding profusely. The bleeding is not stopping and the patient is already

haemo-dynamically compromised. She needs a caesarean section. Failure to act promptly will result in maternal death.

Facilitator: Remember that young, fit women who are showing alteration to vital signs have already lost a lot of blood. If hypotensive it is likely that more than 2 litres have been lost. The woman may also have pre-existing anaemia.

Have a brief general discussion about gestation and balancing the survival of a preterm infant versus the mother's condition. In this situation, the mother's condition is the main concern. Blood is usually in limited supply in resource-poor settings; discuss when to give blood to this patient and what type of blood product.

Discussion points

- Warning signs of minor bleeding before a larger bleed is common in a case of placenta praevia.
- Developing disseminated intravascular coagulation (DIC): bedside clotting test, early signs of DIC.
- The speed of delivery, type of anaesthesia.
- Discuss the availability and use of ultrasound scan: what does the placenta look like on ultrasound scan? What is the practice locally?
- Recognition of anterior placenta at caesarean (large anterior veins: techniques to deal with this will be covered at the surgical skills caesarean section station with doctors/those who perform a caesarean section in that country
- Discuss the risk of haemorrhage at CS from the placental site. (Discuss measures to stop this type of bleeding in Surgical skills module). It is often helpful to insert a condom catheter balloon into the uterus uninflated prior to uterine closure. The tail of the catheter is fed down through the cervix. After closure, if still bleeding the balloon can be inflated.

Station 8.5: Surgical Knots Breakout Session

Equipment List	
■ 8 pieces of surgical tie training equipment or sponge prepared with string/suture. ■ 8 stitch scissors ■ 8 Needle holders	■ Posters on Square knot, Surgeon's knot and instrument tie ■ Video

Key teaching points

- Explain the choice of suture material and size for different procedures (fact box)
- Show video and comment on safe instrument handling and different types of knots demonstrated in the video
- Demonstrate one-handed square knot, surgeon's knot and instrument tie. Emphasize on the importance of locking.
- Guide participants in practising surgical knots.

Key learning points

At the end of this session participants should be able to:

- Discuss the advantages of making appropriate surgical knots (Appropriate surgical knots means less material and lower risk of complications such as infection, haemorrhage.)
- Understand the importance of occluding dead space
- Chose the appropriate type and size of suture material for different obstetric surgical procedures. (Encourage them to influence the ordering/purchasing section in their facilities).
- Practice different types of knots with confidence.

Instructions

General principles:

- The final knot should be as small as possible to avoid tissue reaction and as tight as possible to avoid slipping
- While tying the knot, friction between the strands must be avoided as this can harm strand integrity (especially with catgut)
- It is important to maintain traction on the strand on one end after the first knot is tied to prevent it from loosening.
- Tension on the final knot should be as horizontally as possible. This can be achieved by pulling the two ends of the suture in two opposite directions.

Common Suture Material type and use				
Suture type and features			**Preferred Use**	**Preferred size**
Natural	absorbable	Chromic Catgut	Visceral repair	3/0, 2/0, 0
			Fascia and muscles	0, 1
		Plain Catgut	Blood vessel ligatures	1/0, 0
			Perineal tear/Episiotomy	0, 1, 2
	Non-absorbable	Silk*	ligaments	0, 1
			Skin closure	0, 1
			Blood vessel ligatures	1/0, 0
Synthetic	absorbable	Vicryl (Polyglactin 910)	ligatures	2/0
			Visceral repair	2/0
		Dexon (Polycaprolate)	ligaments	0, 1, 2
	Non-absorbable	Monofilament/Nylon Prolene	Skin closure	0, 1, 2
			ligaments	0, 1, 2
			Nerves repair	3/0, 2/0
			Tendon repair	1, 2

*may cause tissue reaction, it is usually braided increasing the risk for infection.

One-Handed Square Knot

Hold one end of the suture extended over your left index finger. The other end is held between thumb and index finger of the right hand. (Figure 1)

Figure 1

Bring the right strand over the left strand on the left index finger. (Figure 2)

Figure 2

Pass distant phalanx of left index finger under left strand and pull the strand through the loop of the right strand and apply tension in the horizontal plane with the left hand drawn towards and the right hand away from you. (Figures 3 & 4)

Figure 3

Figure 4

Loop the left end of the suture around three fingers of the left hand with the distal end held between the thumb and index finger. (Figure 5)

Figure 5

Bring the right strand of the suture towards you to cross over the left index finger and the left strand. (Figure 6)

Figure 6

Grasp the left strand between the left index and middle finger and pull it through the loop of the right strand. Apply horizontal tension as for the first half hitch. (Figures 7 & 8)

Figure 7

Figure 8

Surgeon's knot

Place the left strand of the suture over your extended left index finger and hold it in the palm of your left hand. Hold the right strand between thumb and index finger of your right hand. (Figure 9)


Figure 9

Cross the right strand over the left strand by moving your right hand away from your body. Pinch your left thumb and index finger to form a loop in the left strand over your left index finger. (Figure 10)


Figure 10

Turn your left hand inward by pronation and slip the loop of the left strand onto your left thumb. Grasp the right strand between thumb and index finger. (Figures 11 & 12)

Figure 11

Figure 12

Slid the loop onto the thumb of the left hand. Draw the right strand to the left with your right hand and grasp it again between left thumb and index finger. (
Figures 13 & 14)

Figure 13

Figure 14

Pull the right strand through the loop forming a double loop. Apply horizontal tension. (Figures 15 & 16)

Figure 15

Figure 16

Grasp the right strand between your left thumb and index finger with the thumb swung under the left strand. (Figure 17)

Figure 17

Release the right strand and re-grasp the right strand with your left hand by putting your left index finger beneath the loop and the left strand. (Figure 18)

Figure 18

Rotate the right strand beneath the left strand by supinating your pinched left thumb and index finger to draw the right strand through the loop. Re-grasp the right strand with your right hand and apply horizontal tension. (Figures 19 & 20)

Figure 19

Figure 20

All pictures and descriptions are taken from Ethicon Knot tying Manual and have been used with the permission of the publisher.

Reference list

Ethicon Knot Tying Manual. http://www.plastic-reconstructive-surgeons.com/Education/Knot_Tying_Manual.pdf

MODULE 9: OBSTRUCTED LABOUR

Using WHO partograph

Exercise 1: workshop (Station 6.1)

Starting a partograph:

- Case 1 – no partograph completed, focus is on making a diagnosis and support in labour
- Case 2 – normal labour

Exercise 2: workshop (Station 6.2)

Partograph and management:

- Case 3 – primary dysfunctional labour
- Case 4 – secondary arrest of labour

Exercise 3: workshop (Station 6.3)

Partograph and management:

- Case 5 – Discussion

Exercise 4: scenario (Station 6.4)

- Case 6 – ruptured uterus (requires about 15 minutes)

Ideally, the cases should be written with time progression in advance on flipcharts with a mechanism for progressive revelation of the findings. Ensure that the new group has completed the last case and is happy for the facilitator to proceed to the next case. If they are not, you should repeat that case.

Station 9.1 Using the partograph – Normal labour (workshop)

Equipment List	
■ Laminated partographs	■ Photocopied partographs
■ Felt pens	■ Pencils
■ Wipes	■ Rubbers

Key teaching points

This is an exercise in completing the partograph. Partographs are provided. Relate details of the labour (examples will be given) and ask the participants to record these details on to the partograph. Check the partographs and open the discussion as to how the findings prompt action at appropriate points throughout each case.

Key learning objectives

- To learn when to start a partograph
- To practise using the partograph
- To learn how to interpret the partograph in normal labour
- To describe and discuss supportive care during labour

Instructions

Describe the various parts of the modified WHO partograph.

Discuss these using the partograph.

Accept that some countries will use their own version of the partograph and may start it at for example, 3 cm and not 4 cm. This is, of course, acceptable. Wherever possible, endeavour to use the country's preferred partograph. However, the basic principles remain the same.

Key features of the modified WHO partograph:

- No latent phase
- Plot starts from cervical dilatation 4 cm
- Fetal heart rate between 100 beats/minute and 180 beats/minute

Using the partograph

The WHO partograph has been modified to make it simpler and easier to use. The latent phase has been removed and plotting on the partograph begins in the active phase when the cervix is 4cm dilated.

Note that the partograph should be enlarged to full size before use.

Record the following information on the partograph.

[The information should be summarised on a flipchart before the station begins and left for participants to view at all times.]

Patient information: Fill out name, gravida, parity, hospital number, date and time of admission and time of ruptured membranes.

Fetal heart rate: Record every half-hour

Amniotic fluid: Record the colour of amniotic fluid at every vaginal examination:

I: membranes intact
C: membranes ruptured, clear fluid
M: meconium-stained fluid
B: bloodstained fluid

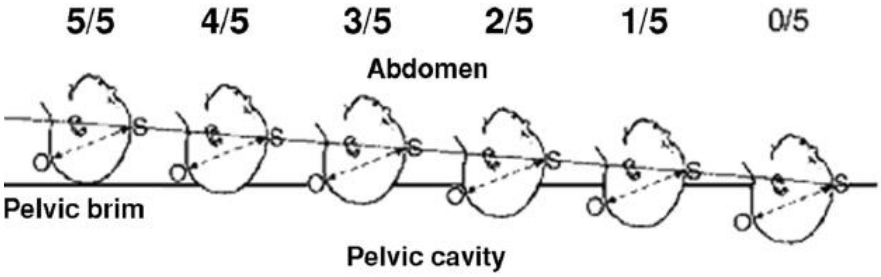
Moulding: **1**: sutures apposed
2: sutures overlapped but reducible
3: sutures overlapped and not reducible

Cervical dilatation: Assessed at every vaginal examination and marked with a cross (X). Begin plotting on the partograph at 4 cm (some countries use 3 cm) on the alert line

Alert line: A line starts at 4 cm of cervical dilatation to the point of expected full dilatation at the rate of 1 cm/hour

Action line: Parallel and 4 hours to the right of the alert line

Descent assessed by abdominal palpation: Refers to the part of the head (divided into five parts) palpable above the symphysis pubis; recorded as a circle (O) at every vaginal examination. At 0/5, the synciput (S) is at the level of the symphysis pubis. Note that although new WHO partograph does not explicitly state this, descent of head and position also assessed at vaginal examination and noted.



Hours: Refers to the time elapsed since onset of active phase of labour (observed or extrapolated)

Time: Record actual time

Contractions: Chart every half-hour; palpate the number of contractions in 10 minutes and their duration in seconds:

Less than 20 seconds: 

Between 20 and 40 seconds: 

More than 40 seconds: 

Oxytocin: Record the amount of oxytocin/volume intravenous fluids in drops/ minute every 30 minutes when used

Drugs given: Record any additional drugs given

Pulse: Record every 30 minutes and mark with a dot (•)

Blood pressure: Record every 4 hours and mark with arrows

Temperature: Record every 2 hours

Protein, acetone and volume: Record every time urine is passed.

Case 1 – Lower abdominal pain

Mrs KA is a 20-year-old primigravida who presented to the labour ward at 9am with history of lower abdominal pains at 38 weeks. She had no history of drainage of liquor this was later confirmed on examination. Her blood pressure was 120/80 mmHg, pulse 90 beats/minute and temperature 37.1°C. Abdominal examination revealed two contractions in 10 minutes, lasting less than 20 seconds. The lie was longitudinal and presentation cephalic the head was 5/5 palpable per abdomen. Fetal heart rate was 140 beats/minute. Vaginal examination showed that the cervix was 2 cm dilated.

The aim of this exercise is to see if participants know when to start the partograph and how to complete a normal partograph.

Question: What action will you take?

Response: Expect participants to say that she is not in labour. Do not start partograph, as not in labour. Give analgesia if needed, observe and discharge home, if possible, with suitable advice.

Question: Why is it important to provide supportive care during labour?

Response: Supportive care during labour ensures respectful care is available and that medical staff provide or facilitate the availability of psychological and physical support care that is important for the prevention/management of anxiety, pain and facilitates labour progress.

Question: What is supportive care during labour?

Response (Participants should give examples under each of the following, the expected response is in the text box below)

- Where possible ensure that the woman has a companion of her choice and the same health care provider throughout labour and childbirth
- Ensure good communication and support by staff

— Maintain cleanliness of the woman and her environment Ensure mobility

SUPPORTIVE CARE IN LABOUR

Ensure that the woman has a companion of her choice and, where possible, the same health care provider throughout labour and childbirth:

— Encourage the woman to have support from a person of her choice throughout labour and childbirth.
— Supportive companionship can enable a woman to face fear and pain, while reducing loneliness and distress, and can promote positive physiologic birth outcomes.
— Where possible, encourage companions to take an active role in her care. - Encourage the companion to give support to the woman during labour and childbirth (e.g. by rubbing her back, wiping her brow with a wet cloth, helping her move about).
— Arrange seating for the companion next to the woman.
— During the second stage, position the companion at the top of the bed to allow the companion to focus on caring for the woman's emotional needs.

Ensure good communication and support by staff:

— Explain all procedures, seek permission and discuss findings with the woman. Provide a supportive, encouraging atmosphere for birth that is respectful of the woman's wishes.
— Ensure privacy and confidentiality.

Maintain cleanliness of the woman and her environment:

— Encourage the woman to wash herself or bathe or shower at the onset of labour.
— Wash the vulval and perineal areas before each examination.
— Wash your hands with soap before and after each examination.
— Ensure the cleanliness of the labouring and birthing area(s).
— Clean up all spills immediately.

Ensure mobility:

— Encourage the woman to move about freely, especially to be in an upright position.
— Support the woman's choice of position during labour and birth

Case 2 – Starting a partograph

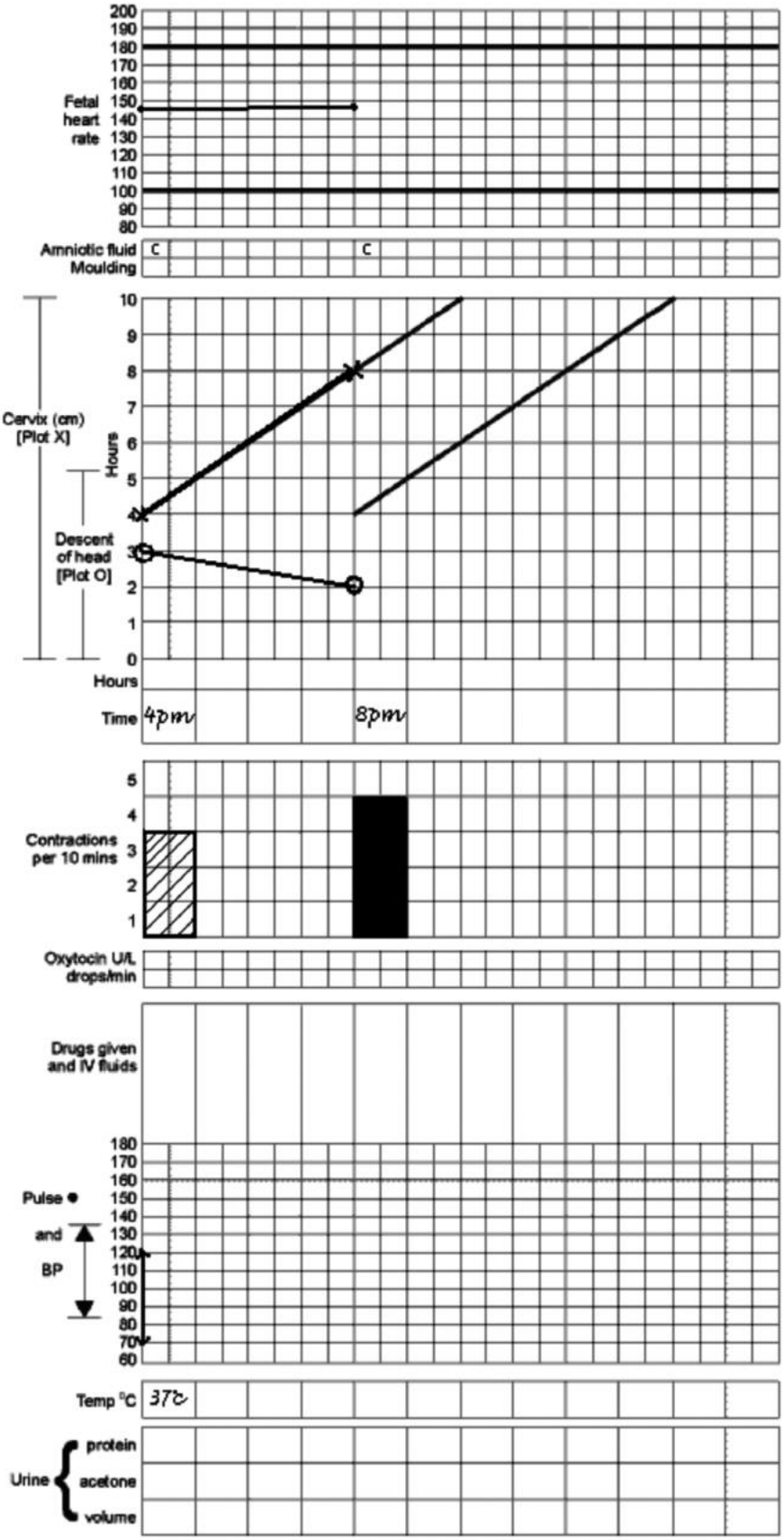
Mrs AD is an 18-year-old woman (para 2+0), who presented to the labour ward at 4pm with 2 hours' history of lower abdominal pains. She is 38 weeks pregnant. She had a 1-hour history of spontaneous drainage of liquor. Her blood pressure was 120/70 mmHg, pulse 88 beats/minute and temperature 37°C. Abdominal examination revealed three contractions in 10 minutes, lasting 35 seconds each. The lie was longitudinal and presentation cephalic the head was 3/5 palpable per abdomen. Fetal heart rate was 144 beats/minute. Vaginal examination showed that the cervix was 4 cm dilated.

Question: What action will you take?

Response: Expect participants to say that she is in labour and to start partograph. Allow participants to enter data and correct where necessary.

Name Mrs. AD Gravida 3 Para 2 Hospital number 1234

Date of admission 06.08.08 Time of admission 4pm Ruptured membranes 1 hours



Further information

At 8 p.m:

- Fetal heart rate: 146 beats/minute
- Liquor clear
- Cervix: 8 cm dilated
- Head: 2/5 palpable and there is no caput or moulding
- Contractions: 4 in 10 minutes, lasting 45 seconds each

Question: Ask participants to enter data on to partograph.

Any action required?

Response: Expect participants to say that she is making good progress so continue observation and anticipate delivery.

Station 9.2: Using the partograph – Dysfunctional labour and secondary arrest (workshop)

Equipment List	
■ Laminated partographs	■ Photocopied partographs
■ Felt pens	■ Pencils
■ Wipes	■ Rubbers

Key teaching points

This is an exercise in completing the partograph using examples of abnormal labour. Laminated partographs and felt pens are provided. Relate details of the labour (examples will be given) and ask the participant to record these details on to the partograph. Check the partographs and open the discussion as to how these prompt action at appropriate points throughout each case.

Key learning objectives
■ To learn to use the partograph (recap)
■ To practise using the partograph in abnormal labour
■ To learn how to interpret the partograph in abnormal labour

Instructions

Briefly recap use of the partograph: use flipchart with key points, as in Station 6.1.

Case 3

Mrs DG is a 19-year-old primigravida who presented in spontaneous labour and was 5 cm dilated on admission. Fetal heart rate 140 beats/minute. Temperature 37.3°C, blood pressure 130/70mmHg, pulse 80 beats/minute. Membranes intact on admission. Longitudinal lie. Cephalic presentation. Mrs DG has been on the labour ward for 10 hours.

The following table summarises her progress:

	Cervix	Contractions	FHR	Liquor	Head	Moulding	Caput
Admission 6am	5 cm	3 in 10 minutes, 40 seconds	140 bpm	Intact membranes	4/5	0	0
10am	5 cm	2 in 10 minutes, 20 seconds	146 bpm	Artificial rupture of membranes: clear	3/5	0	0
12pm (noon)	8 cm	3 in 10 minutes, 40 seconds	140 bpm	Clear	2/5	0	+
4pm	9 cm	2 in 10 minutes, 20 seconds	144 bpm	Clear	2/5	0	+

The purpose of this station on how to use the partograph is to focus on dysfunctional labour related to poor contractions: continued suboptimal progress in labour – distinguishing it from the more abrupt arrest of labour (Case 4).

Ask the participants to plot the information on a partograph.

After each plot (6am, 10am, 12pm and 2pm) ask the participants when next examination should be. Discuss after how often vaginal examination should be repeated (different answers possible).

Question: Comment on the partograph. What actions are required?

Response: Augment labour with oxytocin infusion. Consider analgesia.

Question: What is available locally? What is actually given for pain relief in labour? Briefly comment on when further review should take place after oxytocin started.

Information: Patient was admitted in labour.
Labour not progressing well-cervical dilatation, to the right of alert line.
No signs of obstruction or fetal distress.

Note: in some settings, there will be debate about whether labour should be augmented.

Case 4: Secondary arrest

Mrs HA is admitted in labour in her fourth pregnancy. She had been in labour at home for 6 hours before admission and her membranes ruptured about 4 hours before admission. On admission, she was 4 cm dilated. The fetal heart rate was normal and she had no risk factors. Contractions are three in 10 minutes, lasting about 30 seconds each.

	Cervix	Contractions	FHR	Liquor	Head	Moulding	Caput
Admission 10am	4 cm	3 in 10 minutes, 30 seconds	150 bpm	Spontaneous rupture, clear	3/5	+	+
2pm	6 cm	4 in 10 minutes, 40 seconds	156 bpm	Bloodstained	3/5	+ +	+ +
4pm	6 cm	4 in 10 minutes, 45 seconds	164 bpm	Meconium-stained	3/5	+ + +	+ +

The purpose of this exercise is to recognise the pattern of normal labour being halted in the late first stage of labour and to consider the causes.

Discuss when participants would perform next vaginal examination, then give the information for 2pm.

Ask the participants to plot the information on a partograph.

Comment on the partograph:

- What is your explanation for the arrest in labour?

- What other information would you like to know and why?
- What actions are required:
  - in a BEOC facility more than 2 hours away?
  - in a CEOC facility less than 2 hours away?
  - in a CEOC facility?
- Discuss what participants would or should do in their local setting(s).

This is a case of secondary arrest of cervical dilatation and descent of presenting part with caput and moulding.

Suspect obstructed labour.

Arrest of labour is unlikely to be caused by inefficient contractions, so oxytocin should not be considered and actually could be harmful (rupturing uterus).

Assess:

- Size of fetus
- Presence of moulding
- Amount of head palpable abdominally
- Application of presenting part to cervix
- Station

Look for other signs of cephalopelvic disproportion:

- Cervix poorly applied to presenting part
- Oedematous cervix
- Ballooning of lower uterine segment
- Formation of retraction band (Bandl's ring)
- Maternal and fetal distress
- Ketonuria

Diagnose obstructed labour; note fetal distress and ketonuria.

Discussion points

- This means there is an urgent need to perform caesarean section. Patient may need transfer to a place where caesarean section and blood transfusion services are available: CEmOC facility.
- If time allows, summarise the two cases on the partographs and discuss again, recapping the differences.
- Discuss the difference between obstructed labour and prolonged labour.

Station 9.3: Using the partograph – Failure to progress (workshop)

Equipment List	
■ Laminated partographs	■ Photocopied partographs
■ Felt pens	■ Pencils
■ Wipes	■ Rubbers

Key teaching points

- To practise using the partograph
- To use partograph to make clinical decisions

Actions

Briefly recap, using flipchart with key points as in station 9.1.

Case 5

Mrs SA is a 24-year-old woman (gravida 4, para 3^{+1}) admitted in active labour at term at 10am.

	Cervix	Contractions	FHR	Liquor	Head	Moulding	Caput
Admission 10am	4 cm	3 in 10 minutes, 30 seconds	140 bpm	Spontaneous rupture 2 hours ago, clear	3/5	0	0
2pm	8 cm	3 in 10 minutes, 40 seconds	156 bpm	clear	3/5	+	+
4pm	9 cm	4 in 10 minutes, 40 seconds	120 bpm	clear	1/5	+ +	+ +

Maternal vital signs: blood pressure 130/70 mmHg, pulse 86 beats/minutes, temperature 37°C.

Question: You are called. What would you do?

Response: Get participants to put this information on to a partograph.

Expected responses

- Examine patient to confirm findings
- Start partograph
- Encourage support from a birth companion
- Respect privacy
- Ensure good communication by staff
- Support breathing and relaxation with contractions
- Encourage mobility
- Encourage hydration and nutrition
- Encourage bladder emptying
- Examine after 4 hours

Ask participants to put this information on the partograph and ask what they will do. Is any other information needed?

Check position of fetus. Discuss malposition. Note that rotation in mid-pelvis is physiological.

Occipito-posterior position is frequently associated with prolonged labour of secondary arrest.

Occipito-anterior position identified may lead you to consider that arrest is due to increased fetal size/small pelvis.

Recognise risk of uterine rupture with oxytocin as contractions are good.

Discussion points

- Contractions good? Would use oxytocin or not? Discuss risk of uterine rupture. Use of oxytocin augmentation is very inadvisable in multigravida women because the cause is not usually that of poor contractions. The uterus becomes more sensitive to oxytocin following a completed first labour and therefore the cause is much more likely disproportion due to a malpresentation or position or a much larger fetus.
- Discuss what action is needed if contractions not good.

Station 9.4: Rupture of the uterus (scenario)

Equipment List	
■ Oropharyngeal airway	■ Intravenous fluid (5% dextrose, Ringers lactate, physiological saline)
■ Yankauer sucker	■ Blood sample bottles
■ Spontaneously breathing oxygen mask	■ Urinary catheter
■ Stethoscope	■ Blood pressure cuff
■ Canulae	■ Pinard stethoscope
■ Syringes	■ Cushions
■ Giving set	

Key teaching points

One of the facilitators should play the patient. Cushions are provided to simulate pregnancy. The other facilitator should give participants the history, ask them to repeat back the details and then ask them to deal with the patient as if in real life. Point out that there is equipment available on an adjacent table for them to use. The expected actions of the participants are listed below. The response to be given by the facilitator to the participant's action is given. If the participants fail to deliver expected treatment, guide them gently though the process. Other members of the group can act as assistants. Encourage teamwork.

Key learning objectives
■ To apply the **ABCD** approach to recognising and treating a case of ruptured uterus, from resuscitation to transfer (BEmOC to CEmOC).

Instructions

History

Mrs A is in her third pregnancy, which has been uncomplicated. She is normally fit and well. She says that she has been in labour for 24 hours. When labour started, she went to a traditional birth attendant, where she received traditional medicine to hasten delivery. The patient is calm, but says she feels tired and light headed.

Expected actions

Participant: Call for help.

Facilitator: Ask who?

Participant: Other staff, including senior people if available.

Ensure the patient is placed in left lateral tilt.

Perform brief assessment of airway: "Hello, how are you Mrs Tilt?" look for chest movements, listen for breath sounds, listen and feel for breathing.

Facilitator: Respiratory rate 28/minute, ensure oxygen is given if available. Breath sounds normal.

Participant: Move quickly to assess circulation by presence of pulse, colour, assessment of level of consciousness and blood pressure.

Facilitator: Pulse 130 beats/minute, blood pressure 80/60 mmHg.

Participant: Get intravenous access, send bloods and attach intravenous fluids.

Facilitator: Send bloods for what? Why?

Participant: Palpate abdomen.

Facilitator: On abdominal examination, there are no uterine contractions, fetus is in oblique position and the fetal heart cannot be heard. There is some fresh blood loss from the vagina. Fetal parts are more easy to palpate than usual.

Participant: Suspect major concealed haemorrhage due to ruptured uterus.

Facilitator: Lead participants to this conclusion if necessary.

Participant: Conduct a vaginal examination.

Facilitator: On vaginal examination, the cervix is dilated at 6 cm, the presenting part is high and there is some light vaginal bleeding. Blood loss estimated at 500–600ml. The woman suddenly says she feels very unwell, becomes very agitated and starts to haemorrhage profusely (facilitator who is patient pretends to go into hypovolaemic shock).

Ensure that participants again go through **ABCD** and manage condition appropriately. Pay attention to the need for blood transfusion.

Participant: Should indicate that there is a need to perform a laparotomy urgently.

Discussion points

Discuss mode of transfer if this patient is at a BEmOC. What is needed, monitoring of patient en-route, need to alert CEmOC facility, etc.

MODULE 10: INFECTIONS AND SEPSIS

Station 10.1: Sepsis in pregnancy (scenario)

Equipment List	
■ Spontaneously breathing oxygen mask	■ Ringer's lactate, normal saline
■ Stethoscope	■ Blood sample bottles
■ Canulae of various sizes	■ Blood pressure cuff
■ Syringes	■ Cushions
■ Giving set	■ Thermometer
	■ Pinard's stethoscope

Methodology and approach

One of the facilitators should play the patient. Cushions are provided to simulate pregnancy. The other facilitator should give participants the case history, ask them to repeat back the details and then ask them to manage the patient as if in real life. Point out that there is equipment available on an adjacent table for the participants' use. The expected actions of the participants are listed below. The response to be given by the facilitator to the participant's action is given. If the participants fail to deliver expected treatment, guide them gently through the process. Other members of the group can act as assistants. Encourage teamwork.

Key learning objectives
■ To be able to recognise pregnancy-related infections or sepsis
■ To be able to conduct a full examination to identify the likely cause of infection or sepsis and other pathology
■ To make a treatment plan and manage care in a woman who presents with pregnancy-related sepsis

Instructions

Case History

Mrs K is in her seventh pregnancy, which has been uncomplicated until now. She is 34 weeks pregnant. She is normally fit and well. She says she has felt very unwell for 3 days now and feels she has a fever.

Repeat back these details. You are called to the patient. What would you do?

Expected actions

Participant: **Ensure the patient is lying with a left lateral tilt**

Participant: *Assess **airway**: "Hello, how are you, Mrs K?" Look for chest movements, listen for breath sounds, listen and feel for breathing.*

Facilitator: Breathing is clear and not noisy. What would you do next?

Participant: I would assess Breathing (B) by counting the respiratory rate and auscultating the chest

Facilitator: There is good air entry but **breathing** is very rapid and laboured; respiratory rate 30 breaths/minute.

Participant: *Participant should say that they are happy with the airway but breathing is very rapid and they are worried that the respiratory rate is high [if they do not offer this, you should ask the question].*

Participant: *I will apply oxygen mask.*

Facilitator: Comment that this is the right thing to do if oxygen is available.

Participant: *Participants should say that respiratory rate, heart rate and bounding pulse are signs of sepsis and they would check the temperature.*

Facilitator: If participants do not respond as above, guide them through these checks. Tell them that the mother's temperature is 39.5°C.

Participant: *Assess **circulation** by the presence of a pulse, colour, assessment of the level of consciousness and blood pressure.*

Facilitator: Pulse 125 beats/minute, blood pressure 100/60 mmHg; patient feels hot and pulse is bounding and she seems slightly confused.

Participant: *Listen to fetal heart*

Facilitator: The rate is 160/minute. This may be due to the maternal pyrexia. Make the point that fetal heart rate should be monitored closely.

Ask the participant to summarise case findings to their point. After this has been done, ask "What would you do next?".

Participant: *Get intravenous access and send bloods and urine for laboratory tests and commence intravenous fluids. Give intravenous fluids rapidly and tepid sponge. Give an anti-pyretic drug, e.g paracetamol 1 gm orally*

Facilitator: Send bloods and urine for which tests? How soon will the results be available? What tests are available locally? Ask participants what they think is the most likely diagnosis and differential diagnoses – expect or prompt them to draw the conclusion that the patient has a fever because of infection.

Facilitator: What would you do next?

Participant: *Carry out a head-to-toe examination to try and identify the cause of infection*

Facilitator: What are the possible causes of sepsis in pregnancy?

Participant: *Answers:*

- □ *pyelonephritis*
- □ *malaria*
- □ *chorioamnionitis*
- □ *typhoid or non-typhoid salmonellosis*
- □ *chest infection (pneumonia, tuberculosis, pneumocystis)*
- □ *other: appendicitis, meningitis, tonsillitis, cellulitis etc.*

Facilitator: Emphasise the need for head-to-toe examination. Ask participants to demonstrate a head-to-toe examination on the patient.

During demonstration of head-to-toe examination, the 'patient' is discovered to have loin tenderness. What would you do now?

Participant: *Commence treatment straight away:*

1. *Supportive treatment of fever:*
   - □ *tepid sponging*
   - □ *paracetamol 6 hourly*

2. *Commence broad spectrum intravenous antibiotics, aim to give within the first hour after the patient presents:*
   - □ *cephalosporin such as Ceftriaxone or a combination of antibiotics depending on local protocol*
   - □ *once fever-free for 48-72 hours, you can cautiously consider oral antibiotics to complete over a course of 10–14 days.*

3. Continue to monitor the fetal heart rate hourly until within normal range. If normality not restored, consider delivery

Facilitator: What would you do if no clear cause of fever was identified during the examination?

Participant: *Commence intravenous antibiotics anyway without fail.*

Facilitator: Would you also commence treatment for malaria?

Discussion points

- Discuss what is done in participants' local situation when a patient presents with fever at 34 weeks.
- 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 'patient'.
- Choose one of the conditions mentioned as occurring locally and/or one that occurs less frequently e.g. meningitis, appendicitis.
- In cases of recurrent pyelonephritis, consider prophylaxis with antibiotics during pregnancy.
- Cultures cannot usually be taken but urine microscopy can usually be performed. Discuss what laboratory tests are available.
- Note that pyelonephritis is a clinical diagnosis (loin tenderness, high fever) and does not need laboratory tests if they are not available.
- 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). Need to consider specifically other causes of fever in pregnancy, including chorioamnionitis, pyelonephritis.
- Need for the midwife to be authorised to start intravenous antibiotics even if the medical officer is not present.
- If there is time, discuss the differential diagnosis of fever in women who are HIV-positive and are pregnant (this is also covered in another scenario).

Fact box **WHO Malaria treatment guidelines**

Malaria chemoprophylaxis in pregnancy

In malaria-endemic areas, provide intermittent preventive treatment with sulphadoxine-pyrimethamine (SP) to all women in the second trimester (SP-IPTp) as part of ANC. A minimum of 3 doses at least 1 month apart is recommended.

Treating uncomplicated malaria

- If the malaria species is not known with certainty, treat as for uncomplicated p.falciparum malaria
- Treat all pregnant women with uncomplicated P.Falciparum malaria during the first trimester of pregnancy with 7 days of quinine and clindamycin
- Treat women on their first trimester who have chloroquine-resistant P.Vivax malaria with quinine.
- Treat pregnant women in second or third trimesters with artemisinin-based combination therapies (ACT) for 3 days

Treating severe malaria

Treat with intravenous or intramuscular artesunate for at least 24 hours. Once the patient can tolerate orally and is no longer vomiting, complete the 3-day treatment with oral ACT.

Station 10.2: Sepsis after delivery (puerperal sepsis) (scenario)

Equipment List	
■ Spontaneously breathing oxygen mask	■ Giving set
■ Stethoscope	■ Intravenous fluids (Ringer's lactate, normal saline)
■ Canulae of various sizes	■ Blood sample bottles
■ Syringes	■ Blood pressure cuff
■ Speculum	■ Thermometer
■ Light source	

Teaching points

One of the facilitators should play the patient. The other facilitator should give participants the case history, ask them to repeat back the details and then ask them to manage the patient as if in real life. Point out to the participants that there is equipment available on an adjacent table to use as needed. The expected actions of the participants are listed below. The response to be given by the facilitator to the participants' actions is given. If the participants fail to deliver the expected treatment, guide them gently through the process. Other members of the group can act as assistants. Encourage teamwork.

Key learning objectives
■ To be able to recognise puerperal sepsis
■ To be able to conduct a full examination to identify the likely cause of puerperal sepsis and other pathology
■ To make a treatment plan and start treatment in a woman with puerperal sepsis

Instructions

Case history

Mrs Y delivered 10 days ago. She has been unwell for a week. She has spent 1 day getting to the hospital and on arrival, she is noted to have rigors.

Repeat back these details. You are called to the patient. What would you do?

Expected actions

Participant: *Assess **airway**: "Hello, how are you, Mrs Y?" Look for chest movements, listen for breath sounds, listen and feel for breathing.*

Facilitator: Breathing is clear and not noisy What would you do next?

Participant: Assess breathing by counting the respiratory rate and auscultating the chest

Facilitator: There is good air entry but very rapid and laboured; respiratory rate 30 breaths/minute. The patient is noted to be having frequent rigours.

Participant: *Participants should say that they are happy with the airway but **breathing** is very rapid and they are worried that the respiratory rate is high [if they do not mention this, the facilitator should ask the question].*
Apply oxygen mask.

Facilitator: Comment that this is the right thing to do if oxygen is available.

***Participant**: Assess **circulation** by the presence of a pulse, colour, assessment of the level of consciousness and blood pressure.*

Facilitator: Pulse is 120 beats/minute, blood pressure 110/50 mmHg. The patient feels hot, her pulse is bounding, and she is very drowsy.

***Participant**: Participants should say that respiratory rate, heart rate and bounding pulse are signs of sepsis and they would check her temperature.*

Facilitator: Participants are told that the woman's temperature is 39°C. What would you do next?

***Participant**: Get intravenous access, send bloods and start intravenous fluids.*

Facilitator: Send bloods for what? What is locally available? How soon would test results be available? What would you do next?

***Participant**: Participants should say that they need to take a full case history and conduct a full head-to-toe examination.*

Facilitator: Patient is very unwell; she had a normal delivery at the health centre but now has lower abdominal pain and 'smelly blood'. What would you do next?

***Participant**: Conduct a head-to-toe examination*

Facilitator: Emphasise the need for a full and systematic general and obstetric examination, guided by the symptoms and history.

Ask the participant to demonstrate a full head-to-toe examination. This should include a speculum examination

***Participant:** Demonstrates head-to-toe examination and explains how and why they would conduct a speculum examination.*

Facilitator: On examination, the uterus is clearly palpable, soft and tender. Speculum examination shows a bloody discharge from the cervix.

Ask participant what they think the diagnosis is – expect or prompt them to draw the conclusion that the patient has a fever because of an ascending infection. Ask what the ascending infection might be and discuss the treatment of each suggestion. Give various combinations of symptoms and signs to match the possible differential diagnoses.

***Participant**: Possibilities:*

- □ *Most serious: endometritis – antibiotics to be given include either clindamycin and gentamycin (WHO recommendations for endometritis) 0r if clindamycin is not available then give ampicillin, gentamicin and metronidazole. MVA or D and C should be considered using a large blunt curette to exclude retained placenta and/or membranes, especially if the patient is bleeding. Continue antibiotics for 5-7 days*
- □ *Peritonitis: intravenous ampicillin, gentamicin, metronidazole and discuss if and when laparotomy should be performed.*
- □ *Mastitis: oral cloxacillin or erythromicin; support, cold compresses, paracetamol.*
- □ *Breast abscess: oral cloxacillin or erythromycin; drain abscess, packs, cold compresses, paracetamol.*
- □ *Abdominal or perineal wound infection: debride, intravenous Ampicillin, metronidazole if superficial, if involving muscle intravenous penicillin, gentamicin, metronidazole.*
- □ *Consider HIV-related infections, especially in sub-Saharan Africa.*

Discussion points

1. Availability of antibiotics locally and protocols for intravenous treatment of postpartum sepsis of unknown origin.
2. Who can give IV antibiotics: nurse/midwife? For how many days? Is only the medical officer or doctor able to prescribe?
3. Implications for the delay in treatment and policy of allowing nurse/midwife to commence intravenous antibiotics at any time then seek advice from a medical officer.

Notes

Please read through Station 7.1 to ensure minimal overlap. Station 7.2 provides an opportunity to discuss:

- Puerperal sepsis:
  - how can this be prevented, or the risk reduced?
  - how can this be detected or diagnosed early?
  - are there sufficient checks in place before a woman is discharged after a normal hospital delivery?
- Fever/sepsis after caesarean:
  - prevention: are prophylactic antibiotics used? How? Which ones?
  - are postoperative checks done?
- Fever postpartum and post-caesarean section in a woman who is HIV-positive and without viral load suppression.

Station 10.3: Sepsis after termination of pregnancy (scenario)

Equipment List	
■ Spontaneously breathing oxygen mask	■ Giving set
■ Stethoscope	■ Intravenous fluids (Ringer's lactate, normal saline)
■ Canulae of various sizes	■ Blood sample bottles
■ Syringes	■ Blood pressure cuff
■ Speculum	■ Thermometer
■ Light source	

Methodology and approach

This scenario should begin with a short discussion about whether termination of pregnancy is legal and how much legal/illegal practice takes place. Emphasise that the patient should receive competent, respectful care regardless of whether she may or may not have sought an illegal procedure. One of the facilitators should then play the patient. The other facilitator should give participants the case history, ask them to repeat back the details and then ask them to manage the patient as if in real life. Point out to them that there is equipment available for participants' use on an adjacent table to use as needed. The expected actions of the participants are listed below. The response to be given by the facilitator to the participant's action is given. If the participants fail to deliver expected treatment, guide them gently through the process. Other members of the group can act as assistants. Encourage teamwork.

Key learning objectives

- To be able to recognise sepsis after termination of pregnancy
- To make a treatment plan and start treatment in a woman who presents with sepsis after termination of pregnancy

Instructions

Case history

Miss P has been unwell for a week. She says her last menstrual period was about 10 weeks ago. She has been bleeding on and off for the last one week and has an offensive vaginal discharge. She also complains of lower abdominal pain and fever.

Repeat back these details. You are called to the patient. What would you do?

Expected actions

Participant: *Assess **airway**: "Hello, how are you, Miss P?"*
Facilitator: No need for tilt here: ask why?
Participant: *Look for chest movements, listen for breath sounds, listen/feel for **breathing**.*
Facilitator: Breathing is clear and not noisy. What would you do next?
Participant: Check breathing by counting the respiratory rate and auscultating the chest

Facilitator: There is good air entry but breathing is very rapid and laboured; respiratory rate 30 breaths/minute.

Participant: *Participants should say that they are happy with the airway but breathing is very rapid and they are worried that the respiratory rate is high [if not, you should ask this].*
Apply oxygen mask

Facilitator: Comment that this is the right thing to do if oxygen is available.

Participant: *Assess **circulation** by the presence of a pulse, colour, assessment of the level of consciousness and blood pressure.*

Facilitator: The pulse is 132 beats/minute, blood pressure is 95/55 mmHg, the patient feels hot and her pulse is bounding; she is very confused and pale.

Participant: *Participant should say that respiratory rate, heart rate and bounding pulse are signs of sepsis and that they would check the temperature.*

Facilitator: Miss P's temperature is 39°C.

Participant: *Get intravenous access and send bloods and commence intravenous fluids.*

Facilitator: Send bloods for what? Discuss what tests can be performed locally – you are likely to find that very little is possible.

Participant: *Haemoglobin, malaria parasite screen, and microscopy of urine are probably the only tests available.*

Facilitator: Haemoglobin is very useful. The patient's Hb = 4.5 g/dl
What next?

Participant: *Conduct a head-to-toe examination including speculum examination and vaginal examination if indicated.*

Facilitator: Please demonstrate head-to-toe examination and explain how and why you would conduct a speculum examination.

Participant: *Demonstrates full examination*

Facilitator: You find herb-like leaves or debris in the vagina, cervical os open, smelly bloody discharge.
Ask the participants what they think the diagnosis is – expect or prompt them to draw the conclusion that the patient has a fever because of some infection. Ask what the infection might be and discuss the treatment.

Participant: *Give paracetamol and start sponging, fan. Patient has a low haemoglobin and will require a blood transfusion. Give intravenous antibiotics before cautious uterine evacuation (ampicillin, gentamicin, metronidazole).*

Facilitator: Emphasise that there is a higher risk of perforation if uterus is infected. However, if there are infected retained products the patient is unlikely to improve until the uterus is evacuated.

Discussion points

1. The difficulty of performing the evacuation of retained products of conception in cases of sepsis after incomplete abortion or termination of pregnancy:
   - increased risk of perforation, need for good contraction with an oxytocic but in case of sepsis, the uterus may not contract well until any retained products have been removed. There is also a lower response to oxytocin due to less developed oxytocin receptors in the first trimester.
   - use MVA preferably

- need for adequate anaesthesia.

2. Possible immediate complications: pelvic abscess, bowel perforation, peritonitis.
3. Long-term complications: infertility
4. Termination of pregnancy is illegal is some countries but there is a need for good post-termination care and a sympathetic approach to any woman who presents with complications after a termination of pregnancy (legal or illegal) or with complications because of an incomplete miscarriage.
5. What is done locally by way of post-abortion care?
6. Are there issues with regard to reporting of unsafe (or illegal) termination of pregnancy cases to the police? How is confidentiality respected in those circumstances?

Station 10.4: Septic shock (scenario)

Equipment List	
■ Oropharyngeal airway ■ Yankauer sucker ■ Spontaneously breathing oxygen mask ■ Stethoscope ■ Canulae of various sizes ■ Syringes ■ Intravenous giving set	■ Intravenous fluids (Ringer's lactate, normal saline) ■ Blood sample bottles ■ Urinary catheter ■ Blood pressure cuff ■ Thermometer ■ Pinard's stethoscope ■ Cushion

Methodology and approach

One of the facilitators should play the patient. A cushion may be used to simulate the pregnancy. The other facilitator should give participants the case history, ask them to repeat back the details and then ask them to manage the patient as if in real life. It should be pointed out to them that there is equipment available on an adjacent table for participants' use. The expected actions of the participant are listed below. The response to be given by the facilitator to the participant's action is given. If the participants fail to deliver expected treatment, guide them gently through the process. Other members of the group can act as assistants. Encourage teamwork.

Key learning objectives
■ To be able to recognize severe sepsis ■ To apply the **ABCD** approach in a woman who presents with septic shock ■ To be able to conduct a full head-to-toe examination to identify the likely cause of septic shock and other pathology ■ To be able to develop a management plan and begin treatment in a woman who presents with septic shock

Instructions

Case history

A young woman is brought unconscious to the hospital. Her guardian says that she was well until 2 days ago when she complained of headache and fever. Six hours ago she started talking irrationally and about 2 hours ago she became unconscious. She is breathing rapidly, is febrile and unconscious. She appears to be around 30 weeks pregnant.

Repeat back these details. You are called to the patient. What would you do?

Expected actions

Participant: I will put the patient into the left lateral tilt to avoid aortocaval compression

***Participant**: Call for senior help. Assess **airway**: "Hello, how are you, Mrs Tilt?" Look for chest movements, listen for breath sounds, listen and feel for breathing.*

Facilitator: She is unresponsive; her **breathing** is clear and not noisy. What would you do next?

Participant: Assess breathing by counting the respiratory rate and auscultating the chest

Facilitator: there is good air entry but breathing is very rapid and laboured RR 35 / minute

***Participant**: Participants should say that they are happy with the airway but breathing is very rapid and they are worried that the respiratory rate is high.*
Apply oxygen mask.

Facilitator: Comment that this is the right thing to do if oxygen is available.

***Participant**: Assess **circulation** by the presence of a pulse, colour, blood pressure, assessment of the level of consciousness (**AVPU**) and fetal heart rate.*

Facilitator: Pulse is 140 beats/minute, blood pressure is 80/40 mmHg; the patient feels hot and her pulse is bounding; she is very confused and pale. Consciousness level **P**. The fetal heart rate is absent.

***Participant**: Participants should say that respiratory rate, heart rate and bounding pulse are signs of sepsis and that they would check her temperature.*

Facilitator: Tell them that the patient's temperature is 40°C.

***Participant**: Get intravenous access and send blood and attach intravenous fluids. As the patient is in shock IV fluids need to be given fast, the first litre in 15 minutes and the second in 30 minutes.*

Facilitator: Send bloods for what? The patient is pale and might need blood transfusion; you need to check haemoglobin. What other laboratory tests would be useful? What is available?

***Participant**: Should discuss which laboratory tests can be requested, why and when they are expected to get results back from the laboratory.*

Facilitator: What else should you do?

Participant: Commence broad-spectrum intravenous antibiotics and give antipyretics.

Facilitator: Discuss modes of administration, e.g. rectal paracetamol if unconscious. Also, discuss placing the patient in full recovery position after assessment to avoid aspiration as unconscious.

Facilitator: Please demonstrate the head-to-toe examination you would conduct explaining what you are looking for.

***Participant**: To conduct a full head-to-toe clinical examination including obstetric examination.*

Facilitator: Discuss different scenarios:
1st scenario – abdominal pain (chorioamnionitis) with rupture of membranes and intrauterine death.
2nd scenario – peritonitis with typhoid perforation.
3rd scenario – cerebral malaria, discuss differential diagnoses.
4th scenario – pneumonia

Discussion points

- Infection and fever itself can cause preterm labour.

- Appendicitis in pregnancy is difficult to diagnose; pain comes and goes; the patient can develop an appendicular abscess, pus in the abdomen and severe sepsis. Discuss how to assess whether peritonitis is present (tender abdomen, signs of peritonitis).
- Malaria and typhoid fever may be difficult to distinguish clinically; if the malarial parasite screen is positive and the patient reacts to intravenous anti-malarial drugs, this suggests malaria.
- When and how should the patient be delivered?
- Discuss definition of septic shock, i.e. sepsis with persisting low BP after fluid replacement

References

1. Tarning J 2016: Treatment of Malaria in Pregnancy *N Engl J Med* 374:981-982
2. World Health Association 2015; Guidelines for the treatment of malaria-3rd edition
3. Burlinson C et al 2018: Sepsis in pregnancy and the puerperium. *Int J of Obstetric Anaesthesia* 36, pp 96-107

Fact box **Essential elements of care after termination of pregnancy**

	Prevent unwanted pregnancies and unsafe termination of pregnancy
Community and service provide partnerships	Mobilise resources to help women receive appropriate and timely care for complications from termination of pregnancy
	Ensure that health services reflect and meet community expectations and needs
Counselling	Identify and respond to women's emotional and physical health needs and other concerns.
Treatment	Treat incomplete and unsafe termination of pregnancy and potentially life-threatening complications
Contraceptive and family planning services	Help women prevent an unwanted pregnancy or practice birth spacing
Reproductive and other health services	Preferably provide onsite or via referrals to other accessible facilities in providers' networks.

MODULE 11: ASSISTED VAGINAL DELIVERY

Station 11.1: Vacuum extraction (workshop)

Equipment List

- Pelvic models x 1
- Fetal models x 1
- Vacuum extractor (Omnicup/Procup/reusable Kiwi cup) x 2
- 'Lucy and Lucy's Mum' birthing simulator trainer (Clinical innovations Europe Ltd)-(optional)*
- Syringes for local anaesthesia
- Foley catheter
- Pinard's stethoscope
- Drapes
- Ultrasound gel (or other water-based gel) for lubrication

*If available can be used to practice determination of fetal position

Key teaching points

This is a workshop/skills station concentrating on indications for vacuum extraction, prerequisites for use of vacuum delivery equipment, including preparation of the patient and equipment, contraindications to use of the instrument. The next two stations will involve practising application in different positions and delivery, while the last station will cover when to stop and complications. An alternative station on outlet forceps delivery is provided in the Annex.

Key learning objectives

- To review the indications and prerequisites for the use of the vacuum extractor
- To review the contraindications to the use of the vacuum extractor
- To practice preparation of the equipment
- To discuss when to abandon the procedure

Instructions

1. **Key learning objective 1: Indications and prerequisites of the use of the vacuum extractor**

Emphasise the need for correct assessment (not forgetting the abdominal assessment) before starting the vacuum delivery. Discuss the concept of position, how to identify and record position (a diagram on a flip chart may be useful).

Question: What are the indications for the use of the vacuum extractor?

Answers: Shortening of the second stage of labour, when the pregnancy is at term (36 weeks or more) and the presentation is cephalic,
This may include;
- Prolonged second stage (> 1 hour)
- Maternal exhaustion
- Maternal heart disease

- Severe anaemia
- Fetal distress at full cervical dilatation
- Severe pre-eclampsia and eclampsia
- Cord prolapse at full cervical dilatation

Question: What are the prerequisites for the use of the vacuum extractor?

Answers: The pre-requisites include the following

There must be a clear indication for its use.

— The fetal presentation must be vertex.
— The position of the fetal head must be known with certainty. Where there is moulding, discuss that it is helpful to feel up underneath the pubic symphysis in difficult cases. If the position is lateral then a fetal ear will be felt, or if posterior the bridge of the nose and the eyes are felt.
— The fetal head should be no more than 1/5 palpable abdominally. The urinary bladder must be empty. In and out catheterisation is recommended for all assisted vaginal deliveries only if the woman is unable to void. If there is a Foley catheter in place, its bulb must be deflated. The fetal membranes must be ruptured.
— Vacuum extraction should be carried out at full cervical dilatation. Traction is applied during maternal contractions, preferably supported by maternal expulsive efforts. AVD can be done to an unconscious mother e.g. with eclampsia provided that pre-requites are met.
—

2. **Key learning objective 2: Contraindicators to the use of vacuum extractor**

Question: What are the contraindications to the use of a vacuum extractor?

Answers: There are in fact very few contra-indications;

- There should not be any signs or symptoms of significant **cephalo-pelvic disproportion.** Discuss what these might be. They include; more than 1/5th of the head still palpable abdominally or above station zero, severe caput and moulding.
- Vacuum extraction before full cervical dilation may be hazardous for the mother and fetus and should not be attempted.

For consideration are the following which are in some settings considered contra-indications:

- Fetal prematurity less than 36 completed weeks.
- Non- cephalic presentation (face, brow, breech).
- Fetus diagnosed with bleeding disorders
- Cephalohematoma formation has been described with vacuum extraction following fetal blood sampling (FBS). However, FBS is very rarely performed in low-resource settings

3. Key learning objective 3: Preparation and use of the vacuum equipment

Demonstrate the parts of the equipment, checking that it is functioning properly before use and how to operate the equipment. Briefly discuss the care of the instrument. Emphasis should be placed on the type of equipment available to participants in their practice.

Station 11.2: Vacuum extraction (skill)

Equipment List	
■ Vacuum extractor (Omnicup/Procup/reusable Kiwi cup) x 2 ■ 'Lucy and Lucy's Mum' birthing simulator trainer (Clinical innovations Europe Ltd)	■ Syringes for local anaesthesia ■ Foley catheter ■ Pinard's stethoscope ■ Drapes ■ Ultrasound gel (or other water-based gel for lubrication)

Key teaching points

Station 8.1 covered recognition of need for instrumental delivery, when not to try, preparation of the patient and identification of the position.

This station should cover:

- cup selection
- cup application positions on skull (flexing and deflexing median and paramedian application) parameters of fetal skull on flexing
  identifying the flexion point and application of cup in occipito-anterior positions (DOA, ROA, LOA)
- the technique of creating suction and pulling

The next station (Station 8.3) will cover cup application in occipito-lateral and posterior positions. The last station (Station 8.4) will cover when to abandon, signs of progress and warning signs when to proceed to caesarean section and complications. It is important to properly lubricate Lucy and mum, using water-based gel before demonstration and practice.

Key learning objectives
■ To practice the determination of the flexion point and application of the cup of a vacuum extractor in occipito-anterior positions ■ To learn to identify when and how to apply traction.

Instructions

Demonstrate the procedure and then allow all participants to practice as many times as possible under the supervision.

Key learning objective 1: Determination of flexion pint and cup application
Procedure

- Assess abdominally
- Assess position of fetal head by feeling suture lines and fontanelles
- Discuss local anaesthetic injection to the perineum even if an episiotomy is not anticipated. This will reduce the pain caused by rapid perineal stretching and enable the patient to co-operate with pushing more.

- Apply the centre of the cup over the flexion point – 3 cm in front of the posterior fontanelle along the sagital suture
- Prepare for episiotomy if indicated
- Create a vacuum
- Check application of cup and ensure that there is no trapped soft tissue before and after creating the vacuum. If any maternal vaginal tissue is trapped, release the vacuum, clear the tissue, and recommence. Always check for trapped tissue before applying traction to avoid vaginal tearing.
- Start traction in line and perpendicular to the cup, ask the mother to push, when she has a contraction
- During traction, using your other hand, have one finger on the fetal head and your thumb on the cup in order to detect any slippage of the cup. If the cup starts to slip, stop pulling immediately and re-apply.
- Between contractions, stop pulling, monitor fetal heart rate and check that vacuum is maintained at the right pressure (0.8Kpa or 600mmHg)
- As the head crowns, remove your fingers from the head and cup and guard the perineum or alternatively ask an assistant to guard the periniuem as the head reaches the pelvis floor and distends the periniuem. This may reduce the need for an episiotomy.

Discussion point

- Discuss factors associated with higher failure rates
  Maternal body index of more than 30
  estimated fatal weight over 4000g or clinically big baby
  Incorrect cup placement
  Mid-cavity delivery

Station 11.3: Vacuum extraction (skill)

Equipment List	
■ 'Lucy and Lucy's Mum' birthing simulator trainer (Clinical innovations Europe Ltd) Pelvic models and fetal doll ■ Vacuum extractor (Omnicup/Procup/reusable Kiwi cup) x 2	■ Syringes for local anaesthesia ■ Foley catheter ■ Pinard stethoscope ■ Drapes ■ Ultrasound gel (or other water soluable gel) for lubrication

Key teaching points

Stations 8.1 and 8.2 covered recognition of need for instrumental delivery, when not to try, indications and preparation of patient, determination of the flexion point, application of cup, position on fetal scalp, technique of cup application and traction, and delivery of the baby.

In this station, discuss:

- practice cup application and vacuum extraction with a baby in the occipito-posterior position.

Key learning objectives
■ To practice using the vacuum extractor (occipito-posterior position) ■ To know when to abandon the procedure

This station should cover:

- cup selection, in particular, understanding the need for a posterior cup or omnicup for delivering in the occipito-posterior position
- cup application positions on skull (flexing and deflexing median and paramedian application) parameters of fetal skull on flexing
- identifying the flexion point and application of cup in occipito-posterior positions (DOP, ROP, LOP)
- technique of creating suction and pulling

Instrumental delivery using forceps is covered as an alternative station (Annex) for outlet deliveries. It is important to properly lubricate Lucy and mum, using water-based gel before demonstration and practice.

Key learning objectives
■ To practice the determination of the flexion point and application of the cup of a vacuum extractor in occipito-posterior and occipito-transverse positions. ■ To learn to identify when and how to apply traction.

It is helpful to have an unlabelled chart of different head positions on the flip chart and ask the participants to identify the positions

Instructions

Demonstrate the procedure and then allow all participants to practise as many times as possible under the supervision.

Key learning objective 1: Determination of flexion pint and cup application
Procedure

- Assess abdominally
- Assess position of fetal head by feeling suture lines and fontanelles. If difficult, feel up under the pubic symphysis to identify a landmark such as an ear or the bridge of the nose.
- Hold the fetal head in an OT or OP position and ask all participants to perform a vaginal examination and decide on the position. Once everyone has done this ask them to say what they think the position is. If they get it wrong show them on the model what the position was and let them examine again.
- Apply local anaesthetic to the perineum.
- Apply the cup on the flexion point – 3 cm in front of the posterior fontanelle along the sagittal suture
- Prepare for episiotomy if indicated
- Create a vacuum
- Check application of cup and ensure that there is no trapped soft tissue both before and after creating the vacuum. If tissue is trapped, release the vacuum, remove the tissue and recommence
- Start traction in line and perpendicular to the cup, ask the mother to push, when she has a contraction
- Using your free hand, keep one finger on the fetal scalp and one on the cup to detect any slippage during traction
- Between contractions, stop pulling, monitor fetal heart rate and check that vacuum is at the right pressure (0.8Kpa or 600mmHg)
- As the head crowns remove your fingers from the cup and guard the perineum or ask an assistant to do this as the head reaches the pelvis floor and distends the perineum. This may help prevent tearing and reduce the need for an episiotomy.
- NB as a facilitator, you will need to rotate the fetal head as you push it down through the pelvis. This mimics the actual mechanism where the head tends to rotate as it crowns in real life. It is usual for rotation to occur as the head reaches the wider diameter of the pelvic outlet and it is often delivered in the occipio-anterior position even if the position was originally OT or OP.

Discussion point

- Discuss factors associated with higher failure rates
  Maternal body index of more than 30
  estimated fatal weight over 4000g or clinically big baby
  Incorrect cup placement
  Mid-cavity delivery
- extraction

References

1. Royal College of Obstetrics and Gynaecology Assisted Vaginal Birth. Green-top Guideline No. 26
2. Handbook of Vacuum Delivery in Obstetric Practice 3rd Edition by Aldo Vacca

Station 11.4: (Workshop)

Equipment List	
■ Vacuum extractor (Omnicup/Procup/reusable Kiwi cup) x 2 ■ 'Lucy and Lucy's Mum' birthing simulator trainer (Clinical innovations Europe Ltd)	■ Syringes for local anaesthesia ■ Foley catheter ■ Pinard's stethoscope ■ Drapes ■ Ultrasound or other water-based lubricating gel

Key learning points

The first 3 stations covered recognition of need for instrumental delivery, when not to try, indications and preparation of patient, determination of the flexion point, application of cup, position on fetal scalp, technique of cup application and traction, and delivery of the baby.

Key learning objectives
■ To review when to abandon the procedure ■ To discuss the complications associated with vacuum delivery

In this station, discuss:

- When to abandon the procedure
- Signs of progress
- Warning signs
- Need to proceed to caesarean section
- Complications of a vacuum delivery

In addition, practice cup application and vacuum extraction with a baby in the occipito-posterior position.

Instructions

Ensure that all participants are competent in the use of the vacuum extractor on the models and that they:

- Know when to abandon vacuum extraction
- Know the warning signs
- Can decide when to proceed to caesarean section
- Know the risk of shoulder dystocia
- Know the complications of vacuum extraction

1. Key learning objective 1: When to abandon the procedure

Question: When do we abandon the procedure?

Answers: When there is evidence of progressive decent with moderate traction during each contraction, if delivery is not imminent following three contractions of a correctly applied instrument and If the procedure has lasted up to 15 minutes without imminent delivery of the baby.

If significant descent has not occurred with traction throughout three contractions, stop the procedure and deliver the baby by caesarean section. (If the head is crowning but not delivered by the third pull, one more pull is allowable)

If the cup detaches twice, cease the procedure and complete the delivery by caesarean section.

NB If caesarean section is required it is important that the fetal head is pushed back up by an assistant who continues to apply upward pressure to the fetal head from within the vagina until the uterus is opened and the surgeon reaches their hand down underneath the fetal head.

Emphasise proper assessment: descent of the presenting part via abdominal palpation, position of the fetal head.

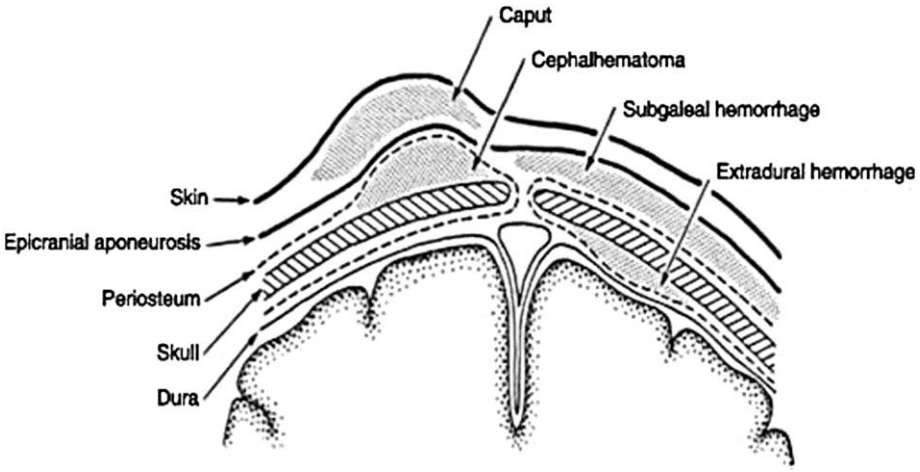
NB Sequential deliveries (use of forceps after using vacuum) is associated with a 3-fold increased risk of intracranial haemorrhage.

2. Key learning objective 2: Complications associated with vacuum delivery

Question: What are the neonatal complications associated with vacuum delivery

Answers

- Clinically insignificant newborn injuries are more common than clinically significant injuries
- Cosmetic injuries effects of vacuum delivery include, scalp swelling or chignon, cup discolouration and brusing. Scalp swelling is non-gravity dependent, crosses suture lines and will resolve within a few days. Scalp discoloration and bruising will also resolve/heal within a few days. Reassure the mother.
- Clinically non-significant injuries include: retinal haemorrhages, blisters, superficial scalp abrations, cephalohematoma (non-gravity dependent and does not cross suture lines), subcutaneous haematoma and mild jaundice.
- Clinically significant injuries: Extensive or deep scalp lacerations, subgaleal (subaponeuric) haemorrhage (gravity dependent swelling that crosses suture lines), intracrianial haemorrhage and skull fracture.



Discussion: Importance of informed consent, good documentation, neonatal resuscitation and getting a second opinion if there are concerns about complications

Question: What are the maternal complications associated with vacuum delivery

- Injury to maternal tissue is possible, vaginal wall or cervix. It is important to check that there is no tissue between the cup and the fetal head after achieving maximum pressure (600mmHg) before pulling.
- Vacuum extraction is less likely to be associated with significant maternal perineal and vaginal trauma compared to forceps.

Assisted vaginal delivery optional module:

Forceps delivery (skill)

Note:
In many countries, vacuum extraction is preferred, and it is more important to spend adequate time on this procedure. Where it is agreed that the forceps should be covered, this module can be used to replace module 8.4 and contents of 8.4 covered in 8.1

Equipment List	
■ Pelvic model	■ Syringes for local anaesthesia
■ Baby model	■ Catheter
■ Forceps (for 'lift out')	■ Pinard stethoscope

Key learning objectives
■ To learn the indications for assisted vaginal delivery using forceps
■ To practise using the forceps (for 'lift out')

Note: In general, especially for nurse-midwives and non-specialised medical staff, it is thought that vacuum extraction is safer to use. However, in specific situations, knowing how to use forceps can be very useful.

Instructions

Indications for use
Indications for which forceps may be preferred instead of vacuum extraction may include:
- after coming head of a breech
- delivery at caesarean section
- births where mother is HIV positive and viral load is unknown or the mother has not had long enough ART treatment to reduce the viral load

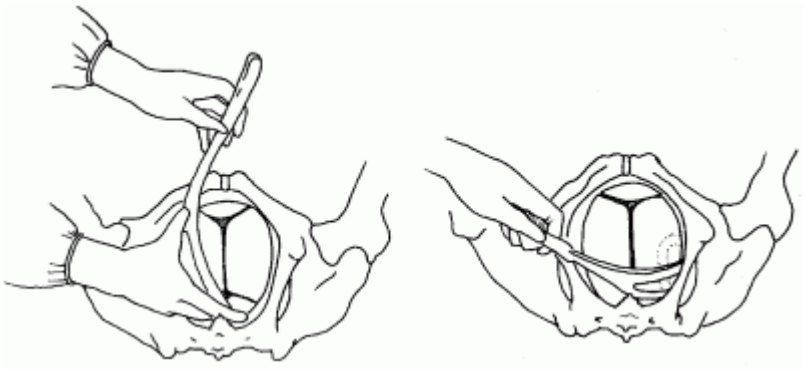
Conditions necessary
Face (mento-anterior only) or vertex presentation, cervix fully dilated, fetal head is at the pelvic floor (4-5 cm below the ischial spines) or 0/5 above symphysis pubis.

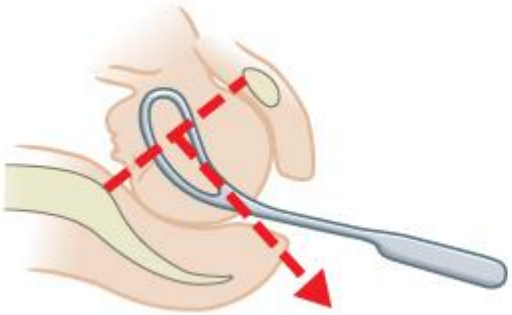
Pre-procedure actions
- Obtain informed consent before the procedure.
- Clean hands,
- drape, clean vulva, catheterize (in –out catheter) only if the women is unable to void,
- administer pudendal block.
- Always check forceps, align them on the table to ensure they are a matching pair and lubricate well.

Note: Routine antibiotic prophylaxis is not recommended for women undergoing forceps-assisted birth.

Procedure

- Perform a bi-manual examination to determine position and descent of fetal head
- Only apply forceps if occipito-anterior (otherwise consider a manual rotation to occipito-anterior)
- Insert two fingers of right hand to vagina and slide in left blade starting with the handle in the line of the ileo-inguinal ligament
- Repeat on other side, depress handles (and lock forceps)
- A biparietal, bimalar application is the only safe application
- Recheck the position of the fetal head before applying traction
- Apply traction inferiorly and posteriorly during contractions for a maximum of three contractions. If there is no descent discontinue, and perform caesarean with manual disempaction of the fetal head vaginally
- Check fetal heart rate and application of forceps
- Perform episiotomy once the perineum is distended and vaginal delivery is inevitable
- Pay attention to active management of the third stage





Post-procedure:

- Inspect the lower gentital tract for any injuries
- Repair episiotomy or any tears under good lighting and analgesia
- Dispose of waste, wash hands and write up procedure
- Inform the mother of what has happened

MODULE 12: COMMON OBSTETRIC EMERGENCIES

Station 12.1: Breech delivery (skill)

Equipment List	
■ Pelvic model x 2	■ Obstetric forceps x 2
■ Breech doll x 2	■ Green drapes x 2

Key teaching points

Briefly describe breech delivery. Then one facilitator should demonstrate breech delivery, emphasising the passive and active components. Using the four-part process wherever possible (see Section 1: Being a good facilitator – Teaching a skill) ensure that all participants practise performing a breech delivery.

Key learning objectives
■ To recognise the conditions necessary for vaginal breech delivery.
■ To learn how to perform a breech delivery.

Instructions

Teach the skill, emphasising the following points:
Aim to complete delivery within 5 minutes of the buttocks delivering to reduce the risk of hypoxia

- A breech may be diagnosed at abdominal examination or on vaginal examination during labour.
- For vaginal delivery to be possible:
  - the breech must be frank or complete (flexed or extended)
  - pelvis must be clinically adequate
  - fetus must not be too large (estimated weight <3.5 kg)
  - must not have had previous caesarean section for cephalopelvic distortion (note that there is limited evidence that clinical pelvimetry is useful)
  - mother must be informed and must agree to aim for vaginal breech delivery
- Allow delivery to proceed until fetal buttocks visible
- 'Hands off the breech'.
- As perineum distends decide whether episiotomy necessary and perform after infiltrating with local anaesthesia.
- Allow buttocks to deliver until back and then shoulder blades are seen.
- If the legs do not deliver:
  - delivery one leg at a time

- □ push from behind knee to flex and abduct the leg
- □ grasp ankle and deliver foot and leg

- Cover body with a drape to avoid your hands slipping with manoeuvres.
- Do not interfere as long as delivery is progressing
- Do not squeeze the abdomen, as this may result in visceral injury
- Ask mother to push with contractions until the shoulder blades appear
- Allow arms to disengage spontaneously one by one
- If arm does not deliver spontaneously, place one or two fingers in the elbow and bend the arm bringing hand down over face.
- If arms stretched above the head or the shoulder is impacted above the pubic symphysis, use Lovset's manoeuvre: (demonstrate this on yourself):
- Gently take hold of buttocks by placing thumbs on the sacrum and the index fingers on the iliac crests but do not pull.
  - □ hold newborn by hips and turn a quarter of a circle so that the fetal back becomes lateral
  - □ Deliver the anterior arm under pubic arch by running your finger over the fetal shoulder down to the elbow, and sweep the arm across the face and chest
  - □ Deliver the second arm by turning back half a circle, keeping the back uppermost as you turn, and repeat the process.
  - □ If first rotation does not result in sufficient descent, repeat the process.
- If body cannot be turned in this way to deliver anterior arm then the posterior arm, try to rotate to the lateral position, then:
  - □ hold and lift newborn by ankles
  - □ move newborn's chest towards mother's inner leg to deliver posterior shoulder
  - □ deliver the arm and the hand
  - □ lay newborn down by the ankles to deliver anterior shoulder
  - □ deliver arm and hand.
- Deliver head by Mauriceau-Smellie-Veit manoeuvre:
  - □ hold newborn's body over your hand and arm
  - □ place first and second fingers on newborn's cheek bones

  use other hand to grasp newborn's shoulder by placing your first and third fingers over the fetal shoulders and use your second finger on the occiput to aid flexion of the fetal head as it descends through the pelvis. Sweep the fetal head through the curve of the maternal pelvis
  - □ raise the newborn, still astride the arm until the mouth and nose are free.
- If the head is stuck:
  - □ Ensure cervix is fully dilated. (If the fetal head is trapped by a non-fully dilated cervix, the cervix will need to be divided. Apply two clamps at 12 o'clock and carefully divide between the clamps with scissors. The cervix should be repaired after the delivery is complete).

- □ apply firm supra-pubic pressure to push head through pelvis
- □ use forceps:
  - have assistant hold baby while applying forceps
  - wrap and hold baby up to the horizontal. Do not over extend as this may cause damage to the fetal neck.
  - place left blade of forceps, working underneath the baby's body
  - place right blade, lock handles and deliver head

  NB: An episiotomy is often necessary when using forceps. Note that in many countries, obstetric forceps are not used in any circumstances.

Station 12.2: Shoulder dystocia (skill)

Equipment List	
■ Pelvic model x 2 ■ Fetal model x 2	■ Flipchart and pens or blackboard and chalk

Key teaching points

Briefly describe then demonstrate what to do in case of shoulder dystocia. Using the four-part process as much as possible (see Section 1: Being a good facilitator – Teaching skills) ensure that all participants practise how to manage shoulder dystocia.

Key learning objectives
■ To learn how to recognise a case of shoulder dystocia ■ To practise management of shoulder dystocia

Instructions

Teach the skill, using the following information:

Signs

- Unable to deliver shoulders
- Fetal head delivered but remains tightly applied to the vulva
- Chin retracts and depresses the perineum (turtle sign)
- Failure of restitution following delivery of the head
- Gentle traction on the head during the next contraction fails to deliver the shoulder

Manoeuvres

- Call for help.
- Explain the problem to the mother and tell her what needs to be done. Explain that it is very important that she does not push
- Lie the patient flat with her buttocks at the edge of the bed
- McRobert's position: bring knees as far as possible up to the chest then abduct and rotate legs outwards. Two assistants must hold the maternal legs in this position. The mother cannot maintain this position herself. Apply gentle axial traction for up to 30 seconds
- Maintain the legs in McRobert's position throughout all subsequent manoeuvres (apart from putting the mother into the all fours position)
- Apply suprapubic pressure using the heel of the hands in a lateral and downwards direction from the side of the fetal back. Note that this is often not well done; ensure that participants understand and are able to do this well. The aim is to rotate the fetal shoulder into the oblique position, aiding its transition under the symphysis pubis.
- Apply gentle axial traction to the fetal head for up to 30 seconds but avoid tugging, twisting and stretching the neck. If constant supra-pubic pressure is ineffective try rocking pressure for up to a further 30 seconds.

- If external manoeuvres fail, move on to internal procedures. There is no evidence as to whether it is better to try to reach for the posterior arm first or undertake internal rotational manoeuvres. An episiotomy may be necessary to facilitate internal manoeuvres. Note that this will not relieve the obstruction, which is at the level of the pelvic bones, but may make entry of the operator's fingers easier and minimize trauma to the vagina and perineum.
- To internally rotate, enter posteriorly as there is no room anteriorly. Run one or two fingers up from the posterior entry point until you reach the back of the anterior shoulder. Also apply one or two fingers of your other hand to the front of the posterior shoulder and try to rotate the fetal shoulders into the wider oblique diameter of the pelvis. If this fails, try to rotate in the opposite direction. If rotation into the oblique diameter is successful but you still can't deliver the baby by applying gentle traction try to rotate through a full 180 degrees and then apply gentle traction. Alternatively, try to deliver posterior shoulder first by grasping the hand (if the arm is flexed the hand should be reachable posteriorly). Once the posterior arm is delivered this will provide room for the anterior shoulder to move under the pelvis.
- If the posterior arm is not flexed it is more difficult but try to reach the antecubital fossa and apply pressure to flex the elbow. This may bring the posterior hand to within reach.
- If all else fails, or if you are on your own, rotate the mother onto all fours. This allows for easier posterior access.
- Consider:
- Placing a catheter sling under the posterior axilla to apply traction
    - fracturing the clavicle

Notes

In cases where one is initially unsuccessful, it is good practice to simply stay calm and to go through all the steps once more.

Discussion points

- Definition of shoulder dystocia: fetal head delivered but shoulders stuck behind symphysis pubis.
- Risk factors: usually not predictable.

Station 12.3: Cord prolapse (discussion)

Equipment List	
■ Pelvic model x 1	■ Intravenous fluids (Ringer's lactate, physiological saline)
■ Fetal model with cord	■ Pinard's stethoscope
■ Foley urinary catheter	
■ Intravenous giving set	

Key teaching points

This should be a discussion and skills practice, using the model to demonstrate. Invite a participant to be the lead or involve the group in general. Allow participants to clarify issues. Highlight good practice and the urgency of the situation. Encourage team thinking and teamwork.

Key learning objectives
■ To learn the difference between cord presentation and cord prolapse
■ To appreciate the need for urgent action
■ To discuss the management of cord prolapse

Instructions

Diagnosis

A cord presentation occurs when the cord is felt below the presenting part with membranes still intact

A cord prolapse is diagnosed when the umbilical cord is felt at the vulva following rupture of the membranes or is felt within the vagina on vaginal examination to be coming down below the presenting part.

Actions

- ■ Look at or gently feel the cord to check whether there are pulsations – if the cord is pulsating, the fetus is alive.
- ■ Determine the lie and the presenting part; the baby may be in transverse lie and, if so, the mother requires a caesarean section urgently.
- ■ Perform a vaginal examination to determine the status of the labour: cervical dilation and level of the presenting part.

If first stage:

- ■ Stop presenting part pressing on cord:
  - □ Place the mother in the knee-elbow position or lying on her side with her buttocks elevated by a pillow
  - □ Manually displace the presenting part
  - □ If there is a need to transfer the mother prior to delivery, catheterize, empty the bladder then fill the bladder with 500 ml saline and clamp the catheter. Do not forget

to remove the clamp before reflecting the bladder perineum and opening the uterus at time of caesarean section.

- Refer to CEOC centre for caesarean section.
- Consider whether it is possible to give salbutamol 0.5 mg intravenously over 2 minutes, or another tocolytic if available.

If second stage and the fetal head is less than 2/5 palpable in the maternal abdomen (NB Cord prolapse would be unusual if the fetal head was well enough descended for an assisted vaginal delivery to be possible):

- Expedite delivery with episiotomy as required and vacuum extraction or forceps.
- If the baby is breech, perform a breech extraction (you are likely to need to perform Lovset's procedure and apply forceps to aftercoming head if required).
- Prepare to resuscitate the newborn.

If the cord is not pulsating, the fetus is dead. Deliver in the manner safest for the mother. In cases of transverse lie with ruptured membranes delivery is most likely to be by caesarean section.

Station 12.4: Twin delivery (skill)

Equipment List	
■ Pelvic model x 2	■ Fetal model x 2

Key teaching points

Briefly describe twin delivery then demonstrate how to perform a twin delivery, emphasising diagnosis, active components and management of possible complications. After a repeat demonstration, invite a participant or participants to demonstrate. Then split the group into two and each facilitator take their group through the process again.

Key learning objectives
■ To learn the steps involved in managing a twin delivery
■ To learn how to manage complications that may be associated with a twin delivery

Instructions

Diagnosis
Can be discovered at abdominal palpation, (more than two fetal poles identified and two fetal heart beats auscultated) by ultrasound scan or upon abdominal or vaginal examination after delivery of the first baby.

Actions

- Start intravenous infusion and prepare oxytocin infusion for augmentation of contractions which may be needed after first twin is delivered (see below).
- Check presentation:
  - if vertex, allow labour to progress as for single vertex
  - if breech, apply guidelines for single breech (but beware if first twin is breech and the second cephalic there is a risk of interlocked twins and if this cannot be excluded a caesarean is safer)
  - if transverse lie deliver by caesarean section
- With delivery of first baby, leave a clamp on the maternal end of the cord of the first twin and do not attempt to deliver the placenta until the second baby is delivered.
- Immediately after first baby delivered perform vaginal examination to determine:
  - whether cord has prolapsed
  - whether membranes are intact
  - presentation of second fetus
- Palpate abdomen to determine lie of second fetus.

If necessary, perform external version to establish a longitudinal lie. whether breech or cephalic. Rotate the baby in whichever direction it is easiest.

- Check fetal heart rate.

For vertex lie:

- If the membranes are intact, carry out controlled rupture of the membranes only after the fetal head has descended into the pelvis.
- Check fetal heart rate between contractions
- Augment contractions if necessary.
- Ideally the second twin should be delivered within 30 -60 minutes after the first twin in order to minimise risks of fetal distress and placental separation. If spontaneous delivery does not occur within 1 hours, or if fetal distress at any point, deliver by caesarean section. NB with a second twin it is acceptable to apply a vacuum cup at a higher level in the pelvis than usual, although the fetal head should still be engaged in the maternal pelvis.

For breech:

- If contractions are inadequate, augment the labour by escalating an oxytocin infusion at a rapid but controlled rate to produce good contractions (three contractions in 10 minutes, each lasting more than 40 seconds).
- If membranes are intact and breech has descended, rupture membranes and deliver as for breech delivery.
- If external cephalic version is not possible and the fetal membranes remain intact, attempt internal podalic version. Feel for a fetal foot (identify by palpating a heel) and grasp the heel firmly between the knuckles of your first and second fingers. Draw the fetal leg down into the vagina as far as possible before rupturing the fetal membranes and continue as a breech extraction.
- Check fetal heart rate between contractions.
- If vaginal delivery is not possible, deliver by caesarean section.

Discussion points

- Delivery of placentas, active management of third stage and aftercare of mother.
- Anticipated complications of twin delivery, such as increased risk of postpartum haemorrhage.
- Experience of participants. Did anyone have to perform a caesarean section for a retained twin recently? Could this have been avoided?

Station 12.5: Uterine inversion (workshop)

Equipment List
■ Flipchart and pens or blackboard and chalk
■ Retained placenta models x 2 (knitted/felt placenta models)
■ Pelvic model x1

Key teaching points

Start the station with a demonstration of uterine inversion using the retained placenta model. After the demonstration, discuss with the participants the incidence, risk factors, prevention, recognition and management of uterine inversion. It is important to leave more time for participants to discuss management. Make the station very much a discussion with the focus on prevention, recognition, and management.

Key learning objectives
■ To learn how uterine inversion can be prevented
■ To learn how uterine inversion can be recognised
■ To learn the management of uterine inversion

Instructions

Demonstrate, using the retained-placenta model and pelvis, how a uterus is said to be inverted if it turns inside-out during delivery of the placenta.

Incidence
1/2000–1/6400 deliveries
Risk factors
This condition may be difficult to predict but associated risk factors include:

- mismanagement of third stage of labour (premature traction of the cord and fundal pressure before separation of the placenta or failure to guard the uterus in the abdomen during placental delivery); this risk increases when the delivery is conducted by an unskilled birth attendant
- uterine atony
- short cord
- precipitate labour
- placenta praevia
- morbidly adherent placenta which is implanted at the uterine fundus
- uterine abnormalities, including uterine tumours
- connective-tissue disorders (Marfan syndrome, Ehlers–Danhos syndrome).

It is important to note that, in up to 50% of the cases, no risk factors are identified.

Prevention
Active management of the third stage of labour was associated with a four-fold decrease in the incidence of acute uterine inversion. This involves applying controlled cord traction after separation of the placenta.

Recognition

Early recognition and prompt treatment reduce morbidity and mortality.

Signs and symptoms include:

- mild or severe lower abdominal pain
- haemorrhage occurs in 94% of cases
- sudden cardiovascular collapse/shock that is out of proportion to the blood loss, and with bradycardia due to vagal stimulation
- uterine fundus not felt on abdominal palpation, the abdomen may feel hollow
- abdominal tenderness
- placenta may or may not be in place
- pelvic examination shows a mass in the vagina or outside the introitus **or**
- polypoidal red mass in the vagina or externally with the placenta attached

Management
- Call for help and resuscitate using the **ABC** approach
- Insert at least one but preferably two wide-bore canulae
- Collect blood for full blood count, coagulation studies and crossmatch
- Start fluid replacement immediately
- Continuously monitor blood pressure, pulse, respiratory rate and urine output
- If the woman is in severe pain, give analgesia (such as pethidine 1 mg/kg intramuscularly or intravenously slowly or morphine 0.1 mg/kg intramuscularly)
- Attempt to reposition the uterus; the earlier the repositioning, the more likely the success
- If necrosis is suspected, perform laparotomy. This may require referral to a tertiary care centre

Reposition the uterus using one of the following methods/techniques:

- Non-surgical methods:
  - manual correction/replacement
  - hydrostatic correction/replacement
  - medical approach

- Surgical methods:
  - Huntingdon's procedure
  - Haultain's technique

Manual correction

Manual correction can be performed with or without general anaesthesia. If it is performed without general anaesthesia, give pethidine intravenously. If necessary, use general anaesthesia. Halothane is recommended as it relaxes the uterus.

Wearing high-level disinfected or sterile gloves, grasp the inverted uterus and push it through the cervix in the direction of the umbilicus to its normal anatomic position, using the other hand to stabilise the uterus once in situ. If the placenta is still attached, manually remove it only *after* completed repositioning, to avoid shock and torrential bleeding.

Hydrostatic correction (O'Sullivan's technique)

If the manual method fails, the hydrostatic correction method should be used next:[2]

- Uterine rupture must be excluded before performing this procedure. The procedure is best carried out in the operating theatre with the patient in lithotomy position with a marked head-down tilt.
- Infuse warm saline into the posterior fornix of the vagina (via a jug or giving set) while the orifice is blocked by an assistant (a rubber glove filled with water may help to seal the vagina). NB: With a good head-down tilt it is not always necessary to block the introitus
- The posterior fornix will stretch out as it is filled with water. This relieves the cervical constriction and results in correction of the inversion.
- Alternatively, the posterior fornix can be filled with warm saline using an intravenous giving set attached to a silicone ventouse cup inserted in the vagina. This technique has the advantage that it produces a better seal

Medical approach

In the presence of a constriction ring, reduction of uterine inversion can be very difficult. Tocolytic drugs have a role in relaxing the uterus before manual or hydrostatic replacement of the inverted uterus. Examples of such drugs are:

- magnesium sulphate 2–4g infused intravenously over 5 minutes
- ritodrine 0.15 mg intravenous bolus
- terbutaline 0.25 mg subcutaneously or intravenously
- nitroglycerine 100–200mg intravenously

The manual replacement and use of tocolytics may fail and a general anaesthetic may be required to achieve uterine replacement. General anaesthetic drugs provide pain relief and uterine relaxation. An example that is widely available in resource-poor settings is halothane but it is important to note that its use may be complicated by severe hypotension.

Surgery

Surgery is indicated if all other attempts have failed.

- Huntingdon's procedure: at laparotomy, Allis forceps are placed within the dimple of the inverted uterus and gentle upward traction is exerted on the clamps, with a further placement of forceps on the advancing fundus. If necessary, an assistant should perform manual correction vaginally as the surgeon is applying traction abdominally.
- Haultain's technique: a longitudinal incision is made on the cervical ring posteriorly (note: anterior incision can injure the bladder) and this facilitates repositioning by Huntingdon's technique. The hysterotomy site is repaired after the replacement has been completed.

Post-procedure care

Once replacement is successful, the uterus should be held in place for a few minutes and uterotonics (ergometrine, Syntometrine® [Alliance], oxytocin or misoprostol) administered to promote contraction of the uterus and to prevent reinversion.

- Infuse oxytocin 30 units in 500ml intravenous fluids (physiological saline or Ringer's lactate) at 10 drops/minute. If there is bleeding, increase to 60 drops/minute.
- Give a single dose of prophylactic antibiotics: ampicillin 2g plus metronidazole 500mg intravenously.
- If there are signs of infection (fever, foul-smelling vaginal discharge), give triple antibiotic therapy until fever-free for 48 hours:
  - ampicillin 2g intravenously every 6 hours
  - + gentamicin 5mg/kg intravenously every 24 hours
  - + metronidazole 500mg intravenously every 8 hours.
- Give appropriate analgesic drugs

References

1. Mehra U, Ostapowicz F. Acute puerperal inversion of the uterus in a primpara. *Obstet Gynecol* 1976;47:30S–32S.

2. Managing complications in pregnancy and childbirth: a guide for midwives and doctors – 2nd ed. Geneva: World Health Organization; 2017. Licence: CC BY-NC-SA 3.0 IGO.

MODULE 13: SURGICAL SKILLS STATIONS

Station 10.1: Manual vacuum aspiration and retained products of conception (skill)

Equipment List	
■ Karman syringes and cannulae	
■ Zoe® gynaecological simulator or pelvic model	■ Cusco vaginal speculum or Auvard vaginal speculum
■ Vulsellum or tenaculum	■ Sponge holding forceps or ovum forceps

Key teaching points

Give a brief description of the procedure of manual vacuum aspiration, indications for the procedure and post-abortion care. Then demonstrate the procedure on a pelvic model. Give participants the opportunity to practise.

Key learning objectives
■ To describe post-abortion care
■ To practise use of the Karman's syringe for manual vacuum aspiration

Instructions

Preparation

- Counsel and support woman
- Give paracetamol or intramuscular pentazocine 30mg or an analgesic that is locally available preferably 30 minutes before the procedure.
- Check equipment – note for molar pregnancy have three syringes ready
- Get woman to empty bladder and wash perineum
- Wash hands and put on gloves

Procedure

- Check size and position of uterus.
- Insert speculum and remove any tissue from vagina and external os.
- Clean the vagina and cervix with a swab soaked with antiseptic solution
- Check cervix for tears (may be seen in cases of unsafe instrumental termination of pregnancy).
- Using vulsellum or tenaculum, hold the cervix.
- Select appropriate-sized cannula and insert it using 'no touch' technique.
- Attach manual vacuum aspiration syringe: release valve on syringe to transfer the vacuum to the uterine cavity.

- Evacuate contents, rotating and moving cannula gently.
- Signs that indicate evacuation is complete include observing pink froth without any tissues, a gritty sensation and the grip of the cervix on the cannula becomes tight. The woman may feel cramps as the empty uterus contracts.
- Remove cannula then vulsellum/tenaculum then speculum.
- Perform bimanual examination to check size and firmness of uterus.
- Check products and if no products of conception think carefully whether this could be an ectopic pregnancy.
- If bleeding persists
  - Consider whether the procedure is incomplete and further products of conception remain, and if so whether further pharmacological or surgical steps should be taken to complete the evacuation.

Give either Misoprostol 200 micrograms orally 8 to 12 hours or 400 micrograms vaginally 3 before the procedure, if the cervix is closed.

- Give post-evacuation advice:
  - what to expect in the next few days
  - when to resume coitus
  - contraceptive advice
  - follow-up appointment
  - other relevant information

Discussion points

- Briefly discuss care of instruments.
- Discuss whether manual vacuum aspiration is performed locally or how else incomplete abortion/miscarriage is usually treated
- Explore to see who has experience with manual vacuum aspiration in the group.
- Briefly discuss what clinical features would point more towards a molar pregnancy and precautions to consider.
- Discuss whether local practice is different to what is taught here.
- Briefly discuss post-abortion care in more detail.

Fact box **Essential elements of post-termination care**

Community and service provider partnerships	Prevent unwanted pregnancies and unsafe termination of pregnancy
	Mobilise resources to help women receive appropriate and timely care for complications from termination of pregnancy
	Ensure that health services reflect and meet community expectations and needs
Counselling	Identify and respond to women's emotional and physical health needs and other concerns
Treatment	Treat incomplete and unsafe termination of pregnancy and potentially life-threatening complications
Contraceptive and family planning services	Help women prevent unwanted pregnancy or practice birth spacing
Reproductive and other health services	Preferably provide onsite or via referrals to other accessible facilities in providers' networks

- Discuss counselling: As part of counselling for family planning, women should be assessed for medical eligibility (WHO, Medical Eligibility Criteria for Contraceptive use)

Type of Contraceptive	**Advise to start**
Hormonal (pills, ring, injections, implants)	• _Immediately • _No additional contraceptive protection is needed
Condom	• _Immediately
Diaphragm, cap	Unsuitable until six weeks after second-trimester abortion
Intrauterine device	• _Immediately • _If infection is present or suspected, delay insertion until cleared • _If haemoglobin is less than 7 g/dL, delay until anaemia improves (unless using Mirena) • _Provide an interim method (e.g. condom)
Voluntary tubal ligation	• _Immediately • _If infection is present or suspected, delay surgery until cleared • _If haemoglobin is less than 7 g/dL, delay until anaemia improves • _Provide an interim method (e.g. condom)

- Discuss other reproductive health services that may be required include, tetanus prophylaxis or tetanus booster, treatment for sexually transmitted infections and cervical cancer screening.

Station 13.2: Retained placenta (skill)

Equipment List
■ Retained placenta models x 2 (knitted/felt placenta models)

Key teaching points

This is a skill station. Start with an initial discussion of the background as below and then teach the skill, preferably using the four-part process of skills teaching (see Section 1: Being a good facilitator – Teaching skills). Demonstrate the skill on the knitted model without commentary, then with commentary, then invite one of the participants to talk you or another student through the skill. Finally, each student carries out the skill with their own commentary. Discuss potential complications during demonstrations or at the end.

Key learning objectives
■ To describe the diagnosis and management of retained placenta
■ To practice manual removal of the placenta
■ To discuss complications associated with retained placenta

Instructions

Procedure

Manual removal of placenta: to be demonstrated and practised on model

- Regional anaesthesia is preferable to general anaesthesia or intravenous sedation
- Empty the bladder
- Give prophylactic antibiotics (e.g. ampicillin and metronidazole intravenously)
- Use aseptic technique
- Place a gloved hand (long glove preferable) into the uterus, with the other hand externally placed on the fundus of the uterus to support the fundus
- Follow the umbilical cord to find the edge of placenta
- Push the hand between the placenta and the body of the uterus and ease placenta away with a gentle sawing action of the side of the hand or by opening and closing the fingers like scissors but keeping the back of the hand against the uterine surface. If the placenta will not detach easily, suspect placenta accreta If the placenta is completely attached, trim the cord short and leave it to resorb in situ. If partially detached but a portion is morbidly adherent, then heavy bleeding is likely, and a hysterectomy will be required

Fact box **About retained placenta**

Definition:	Placenta not delivered 30 minutes after the baby
Incidence:	0.8 – 1.2% of births
Importance	15-20% of maternal deaths associated with postpartum haemorrhage (PPH) are caused by retained placenta but bleeding is not always present
Causes	Placenta separated but trapped in cervix
	Atonic uterus
	Placenta abnormally adherent (accreta, increta, percreta)
Risk Factors	Previous retained placenta
	Previous uterine surgery or trauma
	Uterine abnormality
	Preterm delivery
Initial management	Controlled cord traction (not uncontrolled traction or fundal pressure – this is referred to in haemorrhage lecture)
	Empty the bladder
	Breastfeed
Management	If undelivered after a further 30 minutes or if heavy bleeding at any time, proceed to manual removal of placenta
	Inform the mother and her companion that manual removal of the placenta is needed and explain the procedure.

- When the placenta is fully detached, control the fundus with one hand while extracting placenta and membrane with the other hand, which will still be in the uterine cavity
- Explore the uterine cavity for damage and remnant pieces of placenta and membranes
- Examine the placenta to ensure it is complete
- Give oxytocics and ensure the uterus remains well contracted

Discussion points

- In local setting, who (which cadre of staff) is expected to perform manual removal of placenta?
- Who actually performs the procedure?
- Are nurse-midwives legally 'covered' for this?

Station 13.3: Episiotomy and genital tract trauma (skill)

Equipment List	
■ Episiotomy/perineal repair models	■ Stitch scissors
■ Sutures 2/0 Vicryl rapide with strong needles	■ Episiotomy scissors
■ Needle holders	■ Sharp disposal box/containers
■ Dissecting forceps	■ Syringe with local anaesthesia label

Key teaching points

This is a skill station. Briefly discuss the background, as below, and then teach the skill. Demonstrate the skill on the model, then each participant should carry out the skill with their own commentary. Discuss potential complications during or at the end of the demonstration. This station takes a lot of time, so it is important to have everything ready and to get started as soon as possible.

Key learning objectives
■ To describe the principles of perineal laceration and episiotomy repair
■ To practice perineal and episiotomy repair

Instructions

Procedures

First- and second-degree tears:

- Wash hands and put on sterile gloves, clean perineum with antiseptic.
- Infiltrate perineum with 5 to 20 mls of Lignocaine 1%
- Check anaesthesia is effective by pinching with dissecting forceps.
- Repair vaginal mucosa beginning 1 cm above the apex of the vaginal tear with a continuous suture, ending at the fourchette.
- Repair the perineal muscle in one or two layers with continuous or interrupted sutures.
- Repair the skin with subcuticular sutures or interrupted
- Perform vaginal and rectal examination to check that repair is adequate.

Third- and fourth-degree tears:

- Regional anaesthesia is preferable.
- Wash hands and, using sterile gloves, clean perineum with antiseptic.
- Spinal anaesthesia is given by trained personnel
- Check anaesthesia is effective by pinching with dissecting forceps.
- The rectal mucosa if damaged is sutured with fine, interrupted Vicryl sutures taking care to approximate the mucosal edge and tying the knot in the rectal lumen. Identify the internal anal sphincter, if possible, and repair with interrupted 2.0 suture.

- Identify the two ends of the external anal sphincter (one end is likely to be retracted). Repair with overlapping or end to end interrupted 2.0 sutures (polydioxanone sutures are preferable for this).
- Repair rest of tear as for first- and second-degree tears.
- Give antibiotics (single dose or 5-day course, such as ampicillin and metronidazole).
- Give stool softeners by mouth for 7 days (optional).

Station 13.4 Difficulties at caesarean section (workshop)

Equipment List	
■ Pelvic model	■ Video clip of B-Lynch or model of how to perform B-Lynch suture
■ Foetal model	■ Rusch balloon (or condom with catheter)
■ Wrigley's forceps	

Key teaching points

It is suggested that this is run as a problem-based activity. Ask participants what they see as potential difficulties occurring at caesarean section and then the group can draw on their own experiences of how to manage these. Make sure that all the problems are covered and that all the options for management of the problems are addressed as below. You should be aware that some of the group may not actually themselves carry out caesarean section and discussion should allow for this and should encompass the aspects in which other professionals might be involved, emphasising the importance of teamwork.

This station is thus adapted to the type (level) of participant: if the group consists mainly of doctors, the focus can be largely on surgical technique. If the group consists of mainly nurse-midwives, then consideration should be given to their role in dealing with issues such as pre- and postoperative care, emphasising important points, such as early detection of postpartum haemorrhage, assisting at caesarean, catheter check, monitoring of the patient post-caesarean and infection post-caesarean.

It can be useful to split up the group into smaller groups, thus allowing for focused discussion with different cadres of staff.

Key learning objectives
■ To discuss how to deal with difficulties at caesarean section
■ To review pre- and postoperative management of a patient requiring caesarean section
■ To highlight the importance of team work.

Instructions

Problem: Difficult access to uterus or uterine cavity because of previous surgery or fibroids.

Suggestions: Careful dissection of adhesions especially if bowel involved.
Be aware of landmarks.
Modified uterine incision, but avoid classical incision if at all possible, owing to risk of rupture in subsequent pregnancies. Avoid cutting into a fibroid as there will be heavy bleeding.

Problem: Difficulty in delivering baby because of a high head, transverse lie, breech, preterm baby and impacted head

Suggestions: Use forceps or a sterile vacuum to deliver a cephalic presentation, if head is central but high. Maybe an issue if elective delivery carried out when there is a thick lower segment.

Breech extraction often easiest way to deal with abnormal lie (such as transverse) and sometimes for a high head but try to leave the membranes intact for as long as possible (feeling for the foot with recognition of the heel as a landmark is useful – avoid pulling a hand out).

- With abnormal lie and preterm babies, the smaller the lower segment the larger the incision needs to be (marked U-shaped). Consider the use of a vertical incision only if really necessary.
- Using assistance from below with the presenting part being pushed up can help with a deeply impacted head. Comment on technique used by both assistant and operator. This is especially necessary in cases of failed assisted vaginal delivery.
- If the head is very low, relaxing the uterus can also help. Volatile agents used at general anaesthesia can do this or, if available, consider using 0.25 mg increments of glycerol trinitrate titrated against response. Alternatively try to deliver the baby by the inverted breech method. Reach up into the uterus to find the fetal feet and deliver as a breech.
- The incision can be extended into a J (preferably) or inverted T if absolutely necessary but prior anticipation of problems is important and vertical (classical) incision may be needed. It is important to keep practice of a J or inverted T to an absolute minimum, as this comes with a very high risk of future rupture, especially inverted T This must be balanced against the need to deliver a live baby.

Problem: Morbidly adherent placenta (strongly suspect in a patient with a previous caesarean section and low anterior placenta); risk of hysterectomy is high in these patients.

Suggestions: Preparation for the problem can help. Good assistance, extra staff if possible. The most experienced surgeon available should undertake the procedure.
If unanticipated and placenta completely adherent and unable to remove, leave it in place. DO not try to remove as this will cause heavy bleeding that will be difficult to stop.
If placenta partially separated, need to try to remove. If this is not possible and heavy loss continues consider hysterectomy, either sub-total or total. Balloon tamponade is only effective if the whole placenta can be removed.
Remember, if there is difficulty in delivering the placenta, blood loss may be excessive.

Problem: Placental bed bleeding (more usual with placenta praevia).

Suggestions: Large figure-of-eight sutures, extra sutures needed, extra swabs, suction.
Oversew – B-Lynch suture.
Rusch balloon (if available) – or use condom-catheter balloon.
Pack uterus.

Hysterectomy may be needed – would advise subtotal hysterectomy unless bleeding is very low.

Problem: Difficult section at full dilation.

Suggestions: Make incision high in lower segment (control incision with scissors pointing upwards slightly at the angles of the incision).
Repair both angles carefully before closing incision.
Uterus more likely to be atonic – if so, will need extra oxytocics intravenously as maintenance drip, for at least 4 hours postoperatively.
Consider more extensive use of antibiotics: not only prophylactic dose.
Discuss risks of performing caesarean section in second stage.

Problem: PPH intraoperatively; PPH postoperatively.

Suggestions: Intraoperatively:

- drugs (oxytocics, Ergometrine, Misoprostol
- Condom-catheter or Rusch balloon
- B-Lynch (focus on technique)
- uterine or iliac artery ligation,
- hysterectomy

Postoperatively:

- early diagnosis by using observations and early warning scores and prompt transfusion
- **Determine the source of the bleeding, consider early return to theatre and repeat laparotomy. Bleeding may originate from the uterine incision, especially the angles.**
- drugs: oxytocin infusion if atonic uterus, prostaglandins, etc.

All PPH:

- early diagnosis critical, delay in returning to theatre costs lives!
- vital signs every 15 minutes until patient is fully recovered from anaesthesia, thereafter 30 minutes and continue intensive monitoring for at least 6 hours and/or until patient is clearly revitalised
- observe for obvious bleeding from abdominal scar or vagina
- ensure that monitoring chart is in place

Discussion points

- Prophylactic antibiotics should be considered. What is given locally? When and how?
- It is important to have access to blood transfusion before embarking on a caesarean section.
- There should be a clear and valid indication for a caesarean section.
- Regional anaesthesia: spinal is safer than general anaesthesia.
- Use of Pfannenstiel or midline incision?
- How long should the catheter remain in the bladder?
- How are patients monitored post-caesarean? For how long? Where?
- Pre- and postoperative care are important; teamwork will ensure that complications are detected early.

NEONATAL CARE (ADDITIONAL BREAKOUT ON NEWBORN CARE)

Station 5.1: Essential newborn care

Equipment List	
■ Towels, Gloves ■ Stethoscope, ■ Newborn mannequins (2), ■ neonatal bag and mask, ■ Designated area for resuscitation, suction equipment,	■ Oxygen supply (simulate equipment not available). ■ Vitamin K drops, ■ Yankauer sucker ■ Stethoscope x 2

Key teaching points

In this session, participants will learn the elements of essential newborn care after birth and in the postnatal period. Also, participants will discuss danger signs in newborn babies particularly those at risk of adverse outcomes e.g. low birth weight/prematurity.

Key learning objectives
■ To describe the context of newborn health in low resource settings ■ To recognise newborns who require extra care i.e. premature, low birth weight ■ To be able to provide essential newborn care at birth and the immediate postnatal period ■ To recognise and respond to danger signs in the newborn

Discuss what are the immediate requirements of a newborn baby (refer to lecture: Skin-to-skin, golden minute, APGAR score). Discuss how skin-to-skin and bonding may be achieved during CS.

Discuss the key components of Essential Newborn Care:

- Delayed cord clamping (1 – 3 minutes after birth). Early clamping is only recommended if the baby is asphyxiated and requires moving for immediate resuscitation
- Skin to skin care
- Early initiation of breast feeding (within one hour of birth). Put the baby to the breast as soon as possible after birth
- Give Vitamin K, I mg IM between 60- 90 minutes of birth (may be deferred until later in the first 24 hours if necessary). High risk babies (those with birth trauma, preterm infants, those exposed to maternal medication known to interfere with Vitamin K and those requiring surgery) MUST be given Vitamin K.
- Complete newborn examination within 90 minutes of birth

- Cord care: keep the cord exposed and dry. Do not apply anything to the cord unless in local policy guidelines (Daily chlorhexidine (4%) application to the cord stump is recommended for newborns who are born at home in settings with neonatal mortality rates >30/1,000. Chlorhexidine should be considered only to replace application of a harmful traditional substance (WHO 2017))
- Eye care: Apply antiseptic eye drops or ointment once to both eyes in accordance with national guidance. (Options include: Tetracycline 1% eye ointment, erythromycin 0.5% eye ointment, povidone iodine 2.5% solution (water based NOT alcohol based), silver nitrate 1% solution or chloramphenicol 1% eye ointment)
- Delay bathing until after 24 hours of birth to avoid hypothermia
- Keep the baby warm

Discuss any practices that participants may have encountered that are not recommended/beneficial, including why they are not recommended. See Box 1

Fact box

Forms of care that are beneficial

Sucrose for analgesia in newborn infants undergoing painful procedures
Breastfeeding or breast milk for procedural pain in neonates
Kangaroo mother care to reduce morbidity and mortality in low-birth-weight infants
Vaccines for women to prevent neonatal tetanus

Forms of care likely to be beneficial

Air versus oxygen for resuscitation of infants at birth
Continuous positive airways pressure for respiratory distress in preterm infants
Cup-feeding versus other forms of supplemental enteral feeding for newborn infants unable to fully breastfeed
Devices and pressure sources for administration of nasal continuous positive airway pressure in preterm neonates
Early skin-to-skin contact for mothers and their healthy newborn infants
Interventions to prevent hypothermia at birth in preterm and/or low-birth-weight infants

Forms of care with a trade off

Avoidance of bottles during the establishment of breast feeds in preterm infants
Radiant warmers versus incubators for regulating body temperature in newborn infants

Forms of care of unknown effectiveness

Ad libitum or demand/semi-demand feeding versus scheduled interval feeding for preterm infants
Anticonvulsants for preventing mortality and morbidity in full term newborns with perinatal asphyxia
Enteral iron supplementation in preterm and low-birth-weight infants
Higher versus lower protein intake in formula-fed low birth weight infants
One dose per day compared to multiple doses per day of gentamicin for treatment of suspected or proven sepsis in neonates
Restricted versus liberal water intake for preventing morbidity and mortality in preterm infants
Sodium bicarbonate infusion during resuscitation of infants at birth

Discussion points

Other important aspects of care of the newborn

Lead a discussion covering the following topics.

The three main causes of neonatal mortality are prematurity, sepsis and birth asphyxia.

Danger signs in the newborn include:

Breathing difficulties

- Breathing difficulties
- Respiratory rate >60/minute
- Intercostal recession
- Nasal Flaring
- Grunting
- Cyanosis

These may be a sign of early onset neonatal pneumonia, respiratory distress of prematurity or meconium aspiration

- Central cyanosis may be a sign of congenital heart disease
- Hypothermia
- Tone floppy
- Convulsions NB convulsions in the newborn may be very subtle repetitive abnormal movements. They may be a sign of hypoglycaemia, sepsis or hypoxic ischaemic encephalopathy
- Early onset jaundice, especially in babies <1 day old and preterm babies

Risk factors for neonatal sepsis include:

- Membranes ruptured for >18 hours prior to delivery
- Mother had a fever >38C prior to delivery or during labour
- Foul smelling amniotic fluid

If risk factors are present the baby should be treated with prophylactic antibiotics (ampicillin and gentamycin) for 48 hours. Reassess after 2 days and discontinue unless signs of sepsis or a positive blood culture. All babies with suspected sepsis should be referred to a higher facility.

1. Hypothermia

Hypothermia (temperature less than 36.5°C) must be prevented routinely by handing baby to mother (encouraging skin-to-skin contact) and starting to suckle) as soon as possible, ensuring a warm environment, avoiding early bathing, wet covers, clothes or nappies. Avoid medical examinations at this stage if possible, as this will cause hypothermia.

Note,

- Exclusive breastfeeding for all babies of HIV positive mothers All babies whose mothers are HIV positive should be provided with prophylactic ART.

Post-delivery: warm mother = warm baby – provide blankets and warm fluids (porridge or tea) for mother.

Try to discuss the participants' practice.

If the newborn becomes hypothermic, place on mother's bare chest or abdomen and cover both mother and child, place a hat on the baby's head. Give the mother a hot drink to increase her skin blood flow. Promote 'kangaroo care'.[3] Immediately treat the newborn for hypoglycaemia, as below. Monitor rectal temperature every hour until normal. Discuss local practice/participants' experience.

2. Hypoglycaemia

The main symptoms of hypoglycaemia (blood glucose less than 2.6 mmol/l [(i)] are:

- Lethargy
- Drowsiness or unconsciousness
- Convulsions
- Eyelids partly open or retracted
- and/or hypothermia (temperature less than 36.5°C).

Stress that mostly blood glucose cannot be measured on the spot, so go by the clinical diagnosis.

Hypoglycaemia should be routinely prevented by frequent small feeds (breastfeeding preferred) and treatment of suspected intercurrent infection.

If hypoglycaemia is suspected, and the baby is conscious and stable, continue to breastfeed or give breast milk via a nasogastric tube and recheck glucose in three hours or before the next feed.

If baby is not conscious give 2 ml/kg 10% Dextrose intravenously or 2 ml/kg 10% Dextrose via nasogastric tube if intravenous access cannot be obtained. Infuse 10% glucose at the daily maintenance volume according to the baby's age (via NGT if no iv access). Measure blood glucose 30 minutes after the bolus of glucose and then every three hours. Once the blood glucose is 2.6 mmol/l 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. Gradually reduce the 10% Dextrose infusion as feeding is established.

It is **very important** to stress the importance of breastfeeding. This is for all mothers including those who are HIV positive.

If convulsions occur, exclude other causes such as malaria, meningitis, thiamine deficiency, hypo/hypernatraemia. Mention tetanus as cause of convulsions, mainly at the end of the first week.

[i] Note some countries use less than 2.6 mmol/l. There is no real evidence for an exact value to be used. The main learning point is to recognise hypoglycaemia.

Station 5.2: Examination of the newborn baby

Equipment	
▪ Non-sterile gloves ▪ Paediatric stethoscope ▪ Newborn mannequins ▪ Newborn thermometer	▪ Newborn scales (10kg intervals) ▪ 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 objectives
■ 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:
    1. Do you have concerns?
    2. How is the baby feeding?
    3. 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 and abnormal 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, depressed). If bulging upwards, tense or depressed need to seek senior support. Depressed fontanelles can be a sign of dehydration
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 creases
Assess breathing	40-60 breaths per minute is normal Check for any additional effort of breathing, i.e. intercostal recession, nasal flaring, grunting
Cardiovascular	Check for any central cyanosis, refer if present. HR should be <160/minute
Abdomen	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.

Head-to-toe examination	
Assess	**Normal and abnormal findings**
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

Demonstrate newborn examination and ask participants to practice, as time allows

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.

Reference:

WHO recommendations on Newborn Health, Guidelines approved by the WHO Guidelines Review Committee, updated May 2017

Station 5.4: Kangaroo Mother Care for premature and low birth weight babies

Equipment
■ Laminate of definitions ■ Two fetal mannequins ■ Kangas x 4 ■ Newborn hats x2

Key learning objectives
■ To define low birth weight (LBW) and prematurity in babies ■ To identify the problems associated with LBW and premature babies e.g. thermal regulation, feeding ■ To describe the principles of kangaroo mother care (KMC) ■ To demonstrate how to position a baby for kangaroo mother care.

Facilitator to lead a discussion on definitions & risks of premature and low birth weight babies.

Ask participants to define the following:

Preterm infant

Infants are born preterm at less than 37 weeks' gestational age after:

- spontaneous labour with intact membranes
- prelabour premature rupture of the membranes (PPROM)
- labour induction or caesarean delivery for maternal or fetal indications

Low birth weight infant

- Low birth weight: < 2500g
- Very low birth weight:< 1500g
- Extremely low birth weight: < 1000g

Small for gestational age

Weight for gestational age below 10th percentile

Risks associated with prematurity

- Hypothermia
- Breathing difficulties
- Infections
- Impaired development

Approximately 75% of these deaths can be prevented with low-cost, effective and high-quality supportive care and neonatal intensive care.

Ask participants what interventions may reduce the risk of premature birth

- Antenatal care
- Good nutrition
- Screening and management of maternal infections, diabetes and hypertension
- Smoking cessation
- Family planning
- Prenatal care for adolescents

Ask participants when they would use corticosteroids to improve preterm birth outcomes

Administration of antenatal corticosteroids from 24 to 34 weeks of gestation when

- Gestational age is accurately assessed
- Preterm birth is anticipated imminently
- No clinical evidence of maternal infection
- Skilled birth attendance and safe management of preterm birth
- Neonatal intensive care available (resuscitation, thermal care, feeding, infection management and safe oxygen use

When preterm birth is imminent

- Dexamethasone (IM or oral) or Betamethasone IM
- Total 24 mg in two divided doses 12 hours apart
- Steroids work best if doses are completed 24 hours prior to delivery. However, delivery should not be delayed if mother or baby are in imminent danger

Ask participants what other interventions could be made

- Tocolytic treatments (not for imminent preterm birth)
  Nifedipine (Adalat)
  Loading dose: 20 mg PO in one dose.
  Do not administer sublingually. Do not allow crushing or chewing.
  If contractions continue after 20 minutes, give 10 mg PO every 20 mins for a maximum of 2 doses.
  Maximum initial dose: 40 mg in the first 40-60 minutes.

  Contra-indications: intra-uterine infection, intrauterine fetal death, lethal fetal malformation, Eclampsia or severe pre-eclampsia, **concurrent use of magnesium sulphate** (due to risk of cardiovascular collapse), concurrent use of anti-arrhythmic medications, fetal or maternal arrhythmia (e.g. Wolf-Parkinson-White), maternal heart failure, symptomatic maternal hypotension, allergy to calcium-channel blockers, current antepartum haemorrhage, urgent fetal or maternal indication to deliver.

- Administer magnesium sulphate if gestation less than 32 weeks for prevention of cerebral palsy. Give a 4 g intravenous bolus of magnesium sulphate over 15 minutes, followed by an intravenous infusion of 1 g per hour until the birth or for 24 hours (whichever is sooner).
- Antibiotics for preterm prelabour rupture of membranes (amoxycillin 500 mg TDS). If proven Group B strep colonisation give penicillin 500 mg QDS.

- Kangaroo mother care for babies weighing 2000g or less at birth

Following birth

- Initiate skin-to-skin contact and keep baby warm following birth. Dry, discard wet towel and cover with dry towel or blanket, cover head with hat.
- Delayed cord clamping.
- Check baby's breathing. If problems identified, follow guidelines for resuscitation.
- Explain to parents the needs of a premature baby and why KMC is important. Expect participants to discuss: warmth/continuous skin-to-skin contact, exclusive breastfeeding, reduction in apnoeic episodes and parental bonding.
- Informed consent.

The remainder of this breakout will now focus on Kangaroo Mother Care

Ask participants when Kangaroo mother care is recommended:

- Routine care of stable newborns weighing 2000g or less at birth
- Initiated in healthcare facilities as soon as the newborns are clinically stable
- To be as continuous as possible
- Use intermittent kangaroo mother care if continuous KMC not possible

Ask participants to describe the principles of kangaroo mother care
Early, continuous and prolonged skin-to-skin contact between the mother and the baby

Exclusive breastfeeding (ideally)
Initiated in hospital and can be continued at home
Small babies can be discharged early
Mothers at home require adequate support and follow-up

Participants now practice placing a baby in KMC

- Place baby between the mother's breast in an upright position.
- Turn head to one side and in a slightly extended position allowing the airway to remain open and eye to eye contact between the mother and her baby.

- The baby's hip should be flexed and abducted in a frog position, the arms also to be flexed.
- The baby's abdomen should be at the level of the mother's epigastrium.
- Mother's breathing stimulates the baby, thus reducing the occurrence of apnoea.

How long should KMC be provided?

- The kangaroo position is maintained until the baby no longer tolerates it (wriggling or refusing to stay in KMC position, sweating).
- When continuous care is not possible, the kangaroo position can be used intermittently thereby providing the proven emotional and breastfeeding promotion benefits
- The kangaroo position must be offered for as long as possible (but at least 1-2 hr/sitting), provided the infant tolerates it well.
- Either parent or another family member can provide KMC.

Ask participants what the benefits of KMC are:

For the neonate

- Improved weight gain
- Improved temperature control
- Improved neurological development
- More effective sleeping

For the mother

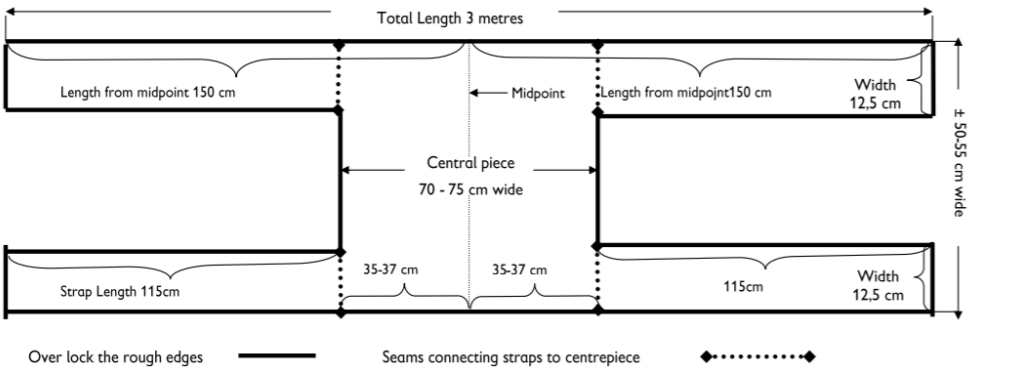
- Strengthened mother-baby bond
- Increased milk production
- Sense of empowerment and responsibility

For the institution

- Resource allocation

Summary

- 75% newborn deaths can be prevented with high-quality care
- Preterm babies are at increased risk of hypothermia, breathing difficulties, infection and impaired development
- KMC meets the basic survival needs and includes: warmth through skin-to-skin contact, breast milk, simulation, love and protection.



Choices of material from which to make the Thari

Polyester Cotton: It works well and is cheap. The material tears easily and it is not necessary to cut the material with a pair of scissors. Poly cottons are usually 110 cm wide and 2 wraps can be made from 2 metres of material.

Cotton knit (t-shirt material): T-shirt material stretches a lot. It would be better to use a material that contains lycra, but lycra is very expensive.

A thin Denim material also works well, it lasts very long especially if you use it over and over in the ward, but unfortunately denim is quite expensive.

Wraps can be made from old sheets, if funds are not available to buy new material.

Figure: The Kangaroo Mother Care Thari Pattern[ii]

[ii] Pattern designed by Dr Elise van Rooyen, Department of Paediatrics, Kalafong Hospital, South Africa

Station 5.5: Newborn sepsis (Scenario)

Equipment List
■ Flip chart and pens or similar ■ Newborn baby model, ■ Stethoscope ■ Thermometer ■ Observation charts

Key Teaching Points

It is suggested that this is run as a scenario-based activity. Try to include all members of the group within the discussion. Aim to cover the first 2 scenarios within 20 minutes.

Key learning objectives
■ To learn to recognise sepsis in the Newborn ■ To identify appropriate responses to a neonate with sepsis in different settings

Scenario 1

A 1-day old baby is brought into a community level health centre with a history of meconium stained liquor during labour, pyrexia of 38.2 degrees centigrade and not feeding properly for 18 hours.

What would you do?
Facilitator: Identifies a volunteer from the group who will lead the care of this baby. The volunteer is asked to repeat the scenario

Facilitator: Discuss the diagnosis of this baby and possible risk factors that could have contributed to this clinical situation?

Participant is expected to discuss relevant additional information obtained from history and clinical examination.

Additional information
The mother was about 8 and half months pregnant, she had drained liquor for 2 days prior to onset of labour pains, her relatives invited a community midwife to see her after 2 days of labour, she delivered a live female baby 1 day later. On presentation the baby weighed 2.4kg.

Participants will also discuss the treatment options.

* based on axillary temperature, thresholds for rectal temperature are approx. 0.5 C higher (38°C)

A young infant with any sign of possible serious bacterial infection needs urgent referral to hospital. Before referral, give a first dose of intramuscular antibiotics and treat to prevent low blood sugar. Malaria is unusual in infants of this age (location dependent, not uncommon in West Africa). Advise the mother to keep her sick young infant warm as young infants have difficulty maintaining their body temperature i.e. KMC or wrap warmly and wear hat. Low temperature alone can kill young infants. [1]

Give first dose of both ampicillin and gentamicin intramuscularly. If referral is not possible, give ampicillin and gentamicin intramuscularly every 8 hours for at least 5 days or IM Gentamicin with oral amoxycillin). [1] (see appendix for dosages).

Recognition in the community setting (age 1 week to 2 months)
Identification of Bacterial infection in infant < 2 months old

Signs	Classify as:	Treatment
• Convulsions • Not able to feed • Vomit everything • Fast breathing (60 breaths per minute or more) • Severe chest indrawing • Nasal flaring • Grunting • Wheeze • Bulging fontanelle • Pus draining from ear • Umbilical redness extending to skin • Tachycardia >150 bpm. • Fever (37.5C* or above or feels hot) or low body temperature (less than 35.5C*or feels cold) • Many or severe skin pustules • Lethargic or unconscious • Less than normal movement	**Possible Serious Bacterial Infection**	➢ Treat current convulsion with IM phenobarbital (1 dose of 20 mg/kg). ➢ Give first dose of intramuscular ampicillin & gentamicin. ➢ Treat to prevent low blood sugar (oral or cup feeds if baby conscious) ➢ If vomiting everything, give nothing by mouth ➢ Advise mother how to keep the infant warm on the way to the hospital. ➢ **Refer/admit URGENTLY to hospital.**
• Red umbilicus or draining pus • Skin pustules • Pus draining from eyes - in a baby with none of the above signs of Possible Serious Bacterial Infection.	**Local Bacterial Infection**	➢ Give appropriate parental antibiotics ➢ Admit ➢ Advise mother to give home care for the young infant ➢ Follow up in 2 days
• None of the above signs	**Bacterial infection unlikely**	➢ Advise mother to give home care for the young infant ➢ Follow up in 2 days

Scenario 2

A baby born 36 hours ago in your CEmOC hospital is brought back into your facility with a history of not feeding, irritable when handled, bulging fontanelle and pyrexia of 39°C. What may be wrong with the baby and what are you going to do?

Facilitator: Identifies a volunteer from the group who will lead the care of this baby. The volunteer is asked to repeat the scenario

Facilitator: Discuss the diagnosis of this baby and possible risk factors that could have contributed to this clinical situation?

Participants are expected to discuss a likely diagnosis of meningitis:
Suspect meningitis if signs of serious bacterial infection (see section 3.8)[1] are
Present, particularly if any one of the following is present:
The infant is:

- Drowsy, lethargic or unconscious
- Convulsing
- Has a bulging fontanelle
- Irritable
- Has a high-pitched cry

It is important to attempt lumbar puncture once the infant has been stabilized,
Ideally within 2 hours of initiating antibiotic treatment, because it serves to confirm
WHO Advised Management (1)
The first-line antibiotics are ampicillin and gentamicin for 3 weeks
Alternatively, give a third-generation cephalosporin, such as ceftriaxone (50 mg/kg every 12 h if < 7 days of age and 75 mg/kg after 1 week) or Cefotaxime (50 mg/kg every 12 h if < 7 days or every 6–8 h if > 7 days of age), and gentamicin for 3 weeks.
If there are signs of hypoxaemia, give oxygen

- If the infant is drowsy or unconscious, ensure that hypoglycaemia is not present. If present, give 2 ml/kg 10% glucose IV.
- Treat convulsions (after ensuring they are not due to hypoglycaemia or hypoxaemia) with phenobarbital
- Make regular checks for hypoglycaemia.
- Establish an IV line and give only IV fluid at maintenance volume according to baby's age for the first 12 hours. (see chart below)

Day of life	1	2	3	4	5	6	7+
ml/kg body weight of feeds and or fluid	**60**	**80**	**100**	**120**	140	150	160+

Please note: avoid giving more than 120ml/kg/day in iv fluids. The remaining fluids should be made up of feeds.

- Take blood sample and send to labs for Culture and Sensitivity, and Hb, white cell count and differentiation if possible.
- Lumbar puncture (for meningitis)
    - Send sample of CSF for cell count, Gram stain, culture and sensitivity
- Give ampicillin and gentamicin IV as below:

  Gentamicin – Use 10mg/ml, 2ml vial = 10mg/ml
- Confirm the diagnosis of meningitis if the:
    - White blood cell count in the CSF is 20/mm^3 or more if the baby is < 7 days old, or 10/mm^3 or more if the baby is 7 days or older
    - Or Culture or Gram stain of the CSF is positive

However, when tests are unavailable, treatment should be initiated on high index of suspicion due to rapid progress of illness. After 12 hours of treatment with antibiotics or when the baby's condition begins to improve, allow the baby to begin breastfeeding. If the baby cannot be breastfed, give expressed breast milk using an alternative feeding method such as cup feeding.

- If the baby's condition is improving after 48 hours of treatment with antibiotics, continue antibiotics for 14 days or for 7 days after signs of improvement are first noted, whichever is longer?

Scenario 3

A 2-day old baby who was delivered at home, is brought in to your BEmOC by his grandmother with a history or reluctance to feed, blistering rash on his palms and soles of his feet, pyrexia. On examination you notice a watery discharge from his nose and abdominal distension (due to enlargement of the spleen and liver). The mother is generally unwell, with sore throat, fever and similar rash on hands and feet.
What do you think is wrong with him and what are you going to do about it?

Facilitator: Identifies a volunteer from the group who will lead the care of this baby. The volunteer is asked to repeat the scenario

Facilitator: Discuss the diagnosis of this baby and possible risk factors that could have contributed to this clinical situation?

Participants are expected to discuss a likely diagnosis of **congenital syphilis**
Clinical signs
■ Often low birth weight
■ Palms and soles: red rash, grey patches, blisters or skin peeling
■ 'Snuffle': highly infectious rhinitis with nasal obstruction
■ Abdominal distension due to enlarged liver and spleen
■ Jaundice

■ Anaemia
Some very-low-birth-weight infants with syphilis have signs of severe sepsis
With lethargy, respiratory distress, skin petechia or other bleeding.
If you suspect syphilis, do a VDRL test if possible.

Treatment

- If Possible, establish an IV line and give only IV fluid at maintenance volume according to baby's age for the first 12 hours. (See chart above)
- Asymptomatic neonates born to women with a positive VDRL or rapid plasma reagin test should receive 37.5 mg/kg (50 000 U/kg) of benzathine benzyl penicillin in a single IM dose.
- Symptomatic infants should be treated with:
- Procaine benzyl penicillin at 50 mg/kg as a single dose by deep IM injection daily for 10 days

Or

- Benzyl penicillin at 30 mg/kg every 12 h IV for the first 7 days of life and then 30 mg/kg every 8 h for a further 3 days.
- **Treat the mother and her partner for syphilis and check for other sexually transmitted infections.**
- If a serologic test is not possible, the mother was treated inadequately before delivery or her treatment status is unknown, treat for congenital syphilis.
- Perform a lumbar puncture and examine CSF for white cell count indicating CNS involvement (white cell count >25/mm^3)
- Observe the baby for 24 hours after discontinuing antibiotics.
- If the baby remains well, is feeding well, and there are no other problems requiring hospitalization, discharge the baby. Follow up in four weeks and report the case to authorities if required.

References

1. World Health Organization (2013). Pocket Book of Hospital Care for Children. Second Ed. Geneva

3.14 Doses of common drugs for neonates and low-birth-weight infants

Drug	Dosage	Form	Weight of infant in kg						
			1–< 1.5	1.5–< 2	2–2.5	2.5–< 3	3–3.5	3.5–< 4	4–< 4.5
Aminophylline to prevent apnoea	Calculate the **exact** oral maintenance dose								
	Loading dose: Oral or IV over 30 minutes 6 mg/kg, then	250 mg/10 ml vial. Dilute loading dose to 5 ml with sterile water, give slowly over 15–30 min	0.6 ml	0.8 ml	1.0 ml	Aminophylline is not usually used for term infants.			
	Maintenance dose: First week of life: Oral: 2.5 mg/kg every 12 h		0.1–0.15 ml	0.15–0.20 ml	0.20–0.25 ml				
	Weeks 2–4 of life: Oral: 4 mg/kg every 12 h		0.15–0.2 ml	0.25–0.3 ml	0.30–0.4 ml				
Ampicillin	IM/IV: 50 mg/kg First week of life: every 12 h Weeks 2–4 of life: every 8 h	Vial of 250 mg mixed with 1.3 ml sterile water to 250 mg/1.5 ml	0.3–0.6 ml	0.6–0.9 ml	0.9–1.2 ml	1.2–1.5 ml	1.5–2.0 ml	2.0–2.5 ml	2.5–3.0 ml
Caffeine citrate	Calculate the **exact** oral maintenance dose								
	Loading dose: Oral: 20 mg/kg (or IV over 30 min)		20–30 mg	30–40 mg	40–50 mg	50–60 mg	60–70 mg	70–80 mg	80–90 mg
	Maintenance dose: 5 mg/kg daily oral (or IV over 30 min)		5–7.5 mg	7.5–10 mg	10–12.5 mg	12.5–15 mg	15–17.5 mg	17.5–20 mg	20–22.5 mg

Drug	Dosage	Form	Weight of infant in kg						
			1–< 1.5	1.5–< 2	2–2.5	2.5–< 3	3–3.5	3.5–< 4	4–< 4.5
Gentamicin	Preferably calculate exact dose based on the infant's weight								
	First week of life: Low-birth-weight infants: IM/IV: 3 mg/kg once a day Normal birth weight: IM/IV: 5 mg/kg per dose once a day	Vial 20 mg/2 ml Vial 80 mg/2 ml Dilute to 8 ml with sterile water to 10 mg/ml	0.3–0.5 ml	0.5–0.6 ml	0.6–0.75 ml	1.25–1.5 ml	1.5–1.75 ml	1.75–2 ml	2–2.25 ml
	Weeks 2–4 of life: IM/IV: 7.5 mg/kg once a day		0.75–1.1 ml	1.1–1.5 ml	1.5–1.8 ml	1.8–2.2 ml	2.2–2.6 ml	2.6–3.0 ml	3.0–3.3 ml
Note: *To use a vial of 80 mg/2 ml, dilute to 8 ml with sterile water to 10 mg/ml, then use exactly the same dose as in the table above.*									
Kanamycin	IM/IV: 20 mg/kg (one dose for pus draining from eyes)	2-ml vial to make 125 mg/ml	0.2–0.3 ml	0.3–0.4 ml	0.4–0.5 ml	0.5–0.6 ml	0.6–0.7 ml	0.7–0.8 ml	0.8–1.0 ml
Naloxone	0.1 mg/kg	Vial 0.4 mg/ml	0.25 ml	0.25 ml	0.5 ml	0.5 ml	0.75 ml	0.75 ml	1 ml
PENICILLIN									
Benzylpenicillin	50 000 U/kg per dose **First week of life:** every 12 h **Weeks 2–4 and older:** every 6 h	Vial of 600 mg (1 000 000 U) dilute with 1.6 ml sterile water to 500 000 U/ml	0.2 ml	0.2 ml	0.3 ml	0.5 ml	0.5 ml	0.6 ml	0.7 ml

DOSES OF COMMON DRUGS FOR NEONATES AND LOW-BIRTH-WEIGHT INFAN

3. YOUNG INFANTS

Drug	Dosage	Form	Weight of infant in kg						
			1–< 1.5	1.5–< 2	2–2.5	2.5–< 3	3–3.5	3.5–< 4	4–< 4.5
Benzathine benzylpenicillin	50 000 U/kg once a day	IM: vial of 1 200 000 U mixed with 4 ml sterile water	0.2 ml	0.3 ml	0.4 ml	0.5 ml	0.6 ml	0.7 ml	0.8 ml
Procaine benzylpenicillin	IM: 50 000 U/kg once a day	3-g vial (3 000 000 U) mixed with 4 ml sterile water	0.1 ml	0.15 ml	0.2 ml	0.25 ml	0.3 ml	0.3 ml	0.35 ml
Phenobarbital	**Loading dose:** IM/IV or oral: 20 mg/kg	Vial 200 mg/ml diluted with 4 ml sterile water	Calculate the **exact** dose						
		30-mg tablets	½	¾	1	1¼	1½	1¾	2
	Maintenance dose: Oral: 5 mg/kg per day	30-mg tablets	¼	¼	½	½	½	¾	¾

Station 5.6: Elimination of Mother to child transmission

Equipment List	
■ Clock x 2	■ Stethoscope x 2
■ Towels x 2	■ Heat source (pretend)
■ Baby x 2	■ Identified designated area for resuscitation
■ Self-inflating bag and mask x 2 (e.g. Ambu® bag and mask)	

Key teaching points

- Scenarios: providing information to parents either antenatally or postnatally regarding ETMTC
- Management of HIV in pregnancy, labour and postnatally to reduce risk of EMTCT
- Advice to parents on prophylaxis and infant feeding choices to reduce risk of EMTCT
- Discussion on how to optimize EMTCT in different circumstances

Key learning objectives
■ To describe HIV transmission from mother to the fetus and newborn
■ To be aware of the WHO Option B+ guidelines
■ To apply K&S of EMTCT to facilitate decision making in care provided to pregnant women and mothers

Case studies for HIV breakout groups

Start by discussing the 4 pillars of HIV prevention and treatment:

1. Primary prevention
2. Contraception for HIV positive women to optimise timing of pregnancy
3. Treatment with option B+
4. Care and treatment for all HIV positive people

Discuss each case as time allows

Cases

Mercy is 24 years old and is 16 weeks into her second pregnancy, which was unplanned. She has a child aged 5 years, delivered spontaneously. Prior to this current pregnancy her HIV status was not known. During her first visit to the ANC it is noted that she has had a cough for more than one month. She is counselled and tested for HIV and the test is positive.

A. What should have happened prior to this pregnancy?

Discuss how Mercy should have been taught strategies for prevention of HIV infection
Discuss how she should have been offered prior testing and contraception in order to enable treatment to be commenced and a pregnancy to be planned once conditions were optimal.

B. Now Mercy is pregnant what needs to happen?

Discuss counselling and testing of both her partner and for her 5-year-old child

C. What investigations should be done in the light of her symptoms?

Discuss investigations for TB due to prolonged cough

D. What other screening does she need?

Discuss STI screening

E. How should Mercy's treatment be planned?

Discuss starting TB treatment 2 weeks prior to HIV treatment.

Hope is a 26-year-old primigravida who attended for antenatal care but was not provided with an HIV test. She presents in the latent phase of labour with a 2-hour history of spontaneous membrane rupture. Her cervix is 2 cms dilated and she is experiencing irregular contractions. She is tested and found to be HIV positive.

A. What are the options for the mode of delivery and what would you recommend to Hope?

Discuss the risks and benefits of caesarean section versus continuing with labour. If labour is the chosen option, how should this be managed in the light of Hope's situation? Options to discuss include caesarean section, or immediate augmentation of labour. Consider if any antiretrovirql medications should be given in labour

Expect a discussion around:

Intrapartum Care

Initiation of ARV treatment in labour:
If an untreated woman presents in labour, it is recommended that the following treatment is offered to minimize MTCT:

1. Nevirapine 200 mgs stat oral dose
2. Initiate oral Zidovudine 300 mg BD, Lamivudine 150 mg BD and Raltegravir 400 mg BD
3. Intravenous Zidovudine infusion, commenced at 2 mg/kg for the first hour, to be followed by 1 mg/kg/hour for the duration of the labour until the cord is clamped and cut.

- NB The regime for treatment in labour for a previously untreated HIV positive pregnant woman may vary from country to country, so be sure to use the local protocol. (The above regime is recommended by the British HIV Association)

Some practices may increase the risk of HIV transmission while having little or no proven obstetric value. Routine management should be modified for all women whether known to be positive or not.
Use universal precautions as for all patients. These include protective gear, safe use and disposal of sharps, sterilization of equipment and safe disposal of contaminated materials

- Minimize vaginal examinations by performing them only when necessary and recording all vaginal examinations performed
- Use of the partograph: Proper and consistent use of the partograph in the monitoring progress of labour will improve the management and reduce the risk of prolonged labour in all women.
- Avoid artificial rupture of membranes unless strictly necessary. Aim to deliver within 4 hours of membrane rupture to reduce the risk of transmission
- Aim to:
- Avoid invasive procedures, such as using scalp electrodes or scalp sampling (unlikely to be an issue in low resource settings)
- Avoid routine episiotomy
- Minimise the use of forceps or vacuum extractors, to avoid the risk of scalp trauma.

However, these instruments should be used if clinically indicated.

Elective Caesarean section performed **before the onset** of labour or membrane rupture has been associated with reduced MTCT. Broad-spectrum antibiotics should be used routinely after caesarean section. The decision to undertake caesarean section delivery to prevent MTCT should be balanced against the immediate and long-term risks to the mother and is ultimatelty the decison of the mother herself based upon providing her with sufficient information to enable informed consent.

Indications for elective CS

Although elective CS will not be available in most health facilities for EMTCT, there may be some cases that merit consideration for CS. These include pregnancies where the mother has not been treated with ARVs or medication has been started very late in the pregnancy, with insufficient time for supporesion of viral load, where labour is expected to be prolonged or where other obstetric complications may be associated with increased risk of transmission.
NB: If the mother has been on ARVs throughout pregnancy or from around 14 weeks with good compliance, then she should be treated in the same manner as an HIV negative mother, and caesarean should be offered on obstetric grounds only.
When performing caesarean delivery in cases of intact membranes, try if possible, to open the uterus whilst keeping the membranes intact. Insert the delivering hand gently between the uterine wall and the membranes, gradually separating the membranes from the wall of the uterus. Bring the fetal head out thorough the uterine incision still within the membranes. Once the entire head is delivered, the membranes should be ruptured. Deliver the baby onto a clean towel on the mother's abdomen and immediately wipe off any maternal blood, paying particular attention to the baby's hands and mucus membranes.

Faith is a 19-year-old primigravida who has had no antenatal care. She presented in established labour and a test was performed there and then which was positive for HIV. She went on to have a rapid vaginal delivery before any treatment could be initiated.

A. How should Faith and her baby be treated?

Discuss appropriate treatment regimes

B. What advice would you give to Faith about infant feeding in the light of the finding?

Discuss feeding options

C. When and how should the baby be tested?

Discuss when to do PCR

General considerations:

Neonatal care

- There is no need to avoid delayed cord clamping, and this should be practiced. Avoid suctioning unless there is a meconium or excess secretions and the baby fails to breathe. If you must suction, use low pressure or bulb suction. If the baby is breathing spontaneously do not use any suction.
- Wipe baby dry with particular attention to the mucous membranes and hands. Wiping should be done carefully to avoid trauma to the skin. The preterm infant's skin bruises more easily.
- Umbilical cord requires good hygiene; the mother should be instructed on how to clean the cord as per the recommended guidelines

Risks of HIV transmission with or without breastfeeding

- Four out of 20 babies born to known HIV-infected mothers will be infected during pregnancy and delivery without ART
- Three more may be infected by breastfeeding without ART
- Infant risk greatly reduced with maternal ART in pregnancy, childbirth and breastfeeding. All mothers are now recommended to adhere to option B+, commencing ART as soon as a diagnosis of HIV positivity is made, and remaining on ART for life. With good adherence, the viral load should remain suppressed and the risk of transmission is low.
- Risk may be reduced if baby is breastfed exclusively using good technique

Risk of not breastfeeding may be much higher because replacement feeding carries risks too:

- Diarrhoea because of contamination from unclean water, unclean utensils or because the milk is left out too long
- Malnutrition because of insufficient quantity given to the baby, the milk is too watery, or because of recurrent episodes of diarrhoea

Mixed feeding increases the risk of diarrhoea. It may also increase the risk of HIV transmission (WHO 2015).

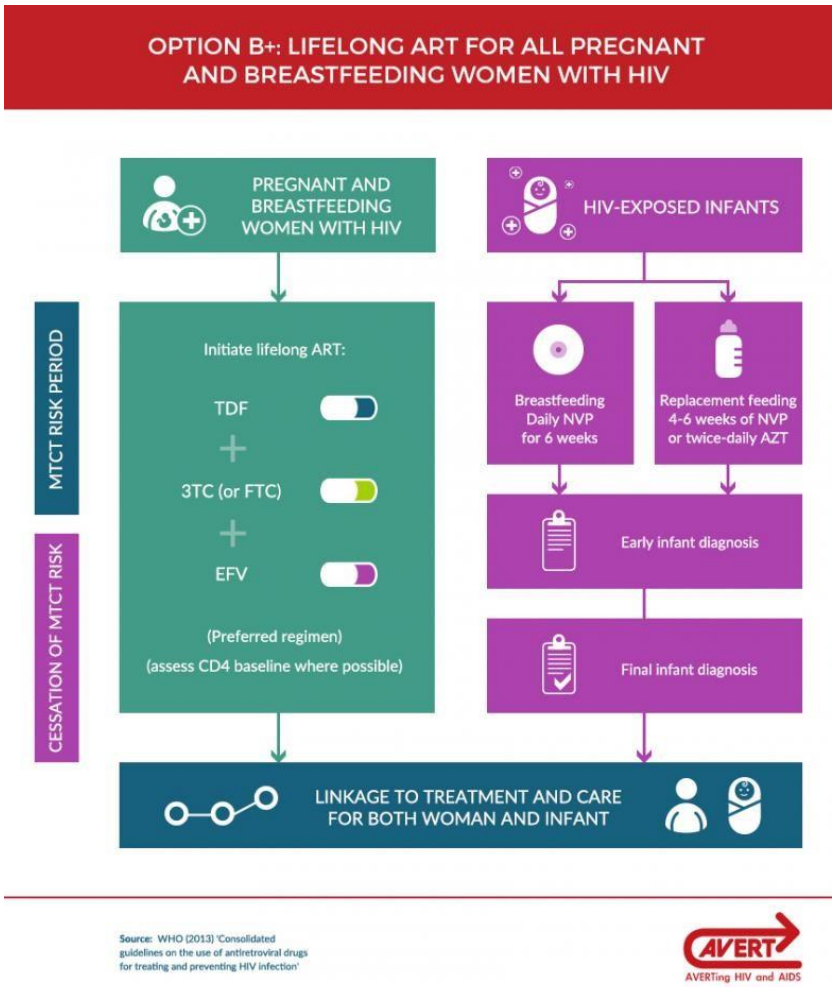


Figure: Option B+ (WHO 2015 recommendation)

Infant feeding in the context of HIV

Follow National Guidelines

— Counsel/support mothers with HIV to breastfeed and receive ARVs **OR** avoid breastfeeding

When choice is breastfeeding:

— Exclusive breastfeeding for the first 6 months, introduce appropriate complementary foods then continue breastfeeding for another 6 months

— Stop breastfeeding when nutritionally adequate and safe diet can be provided

Mother	Infant	Recommendation
• Living with HIV • On ART	Un-infected or unknown status	Exclusive breastfeeding for first 6-months Then introduce appropriate complementary feeds Continue breastfeeding (no restriction on duration)
• Living with HIV • On ART • Mixed feeding	Un-infected or unknown status	Mixed feeding is not a reason to stop breastfeeding in the presence of ARV drugs
• Living with HIV • On ART • Planning to breastfeed for less than 12 months	Un-infected or unknown status	A shorter duration of breastfeeding of less than 12-months is better than never initiating breastfeeding

Infants at high risk	Infants at low risk
Born to mothers: • With HIV, on ART for < 4weeks at delivery • With HIV viral load >1000copies/mL • Incident HIV infection during pregnancy or breastfeeding • Identified for the first time during the Postpartum period	• None of the high risk factors applicable
Recommendation:	**Recommendation:**
Whether breastfed or formula fed **Dual prophylaxis:** AZT – twice daily and NVP once daily Duration: first 6 weeks	Formula fed (replacement feeding) 4-6 weeks of NVP once daily or AZT twice daily for 4 to 6 weeks
Breastfed only Continue prophylaxis for additional 6 weeks with above regimen or with NVP alone	Breastfed NVP single dose daily for 6 weeks

Read sections

2.5.1 from p28 regarding diagnosis and treatment of infants
4.3.2 on when to start treatment in pregnancy and breastfeeding women

4.4 on which Antiretroviral drugs to use
4.4.7 Infant prophylaxis
4.4.8 Infant feeding
4.7 Antiretroviral drug interactions
5.2 Use of co-trimoxazole
5.2.2 Co-infection with TB

References

1. WHO consolidated guidelines on the use of Antiretroviral drugs for treating and preventing HIV infection 2nd Edition, 2016http://apps.who.int/iris/bitstream/handle/10665/208825/9789241549684_eng.pdf;jsessionid=B1FF7023922FEB6E2B2EDB087423FAA1?sequence=1

2. Kennedy C et al 2017 Elective caesarean for women living with HIV; a systematic review of risks and benefits AIDS 31:1579-1591 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5491238/pdf/aids-31-1579.pdf

3. British HIV association guidelines for the management of HIV infection in pregnant women 2018 http://www.bhiva.org/documents/Guidelines/Pregnancy/2018/BHIVA-Pregnancy-guidelines-consultation-draft-final.pdf

4. World Health Organization, Maternal and Newborn Health/Safe Motherhood. *Thermal Protection of the Newborn: A Practical Guide*. WHO/RHT/MSH 97.2. Geneva: WHO; 2007 [www.who.int/making_pregnancy_safer/documents/ws42097th/en/index.html]

5. WHO and UNICEF Guideline update on HIV and Infant feeding-2016 http://apps.who.int/iris/bitstream/10665/246260/1/9789241549707-eng.pdf?ua=1

6. World Health Organisation, Recommendations on Newborn Health updated May 2017 https://apps.who.int/iris/bitstream/handle/10665/259269/WHO-MCA-17.07-eng.pdf?sequence=1

APPENDIX 1

Using the Partograph

Key Learning Points

- To learn when to start a partograph
- To learn how to complete a partograph
- To be able to recognise abnormalities of the active phase of labour
- To be able to recognise and know what to do in the case of prolonged or obstructed labour
- To achieve competency in the skills required to use a partograph

What is a Partograph?

The partograph is a structured graphical representation of the progress of labour. It shows cervical dilatation in relation to time, frequency, and strength of contractions, fetal heart rate, maternal BP, pulse and temperature and any medication given.

The partograph is simple to use and allows the progress of labour to be seen at a glance on one sheet of paper. Failure to progress can be easily recognised.

A partograph has an alert line. Unsatisfactory progress in labour occurs when cervical dilatation is to the right of the alert line on the partograph.

An action line is drawn 4 hours to the right of the alert line.

Starting the partograph
A partograph chart must only be started when a woman is in established labour, also known as the active phase of labour.

The **latent phase** (slow period of cervical dilatation) is from 0cm to 3cm with a gradual shortening of the cervix.

The **active phase** (faster period of cervical dilatation) is from 3cm to 10cm (full cervical dilatation).

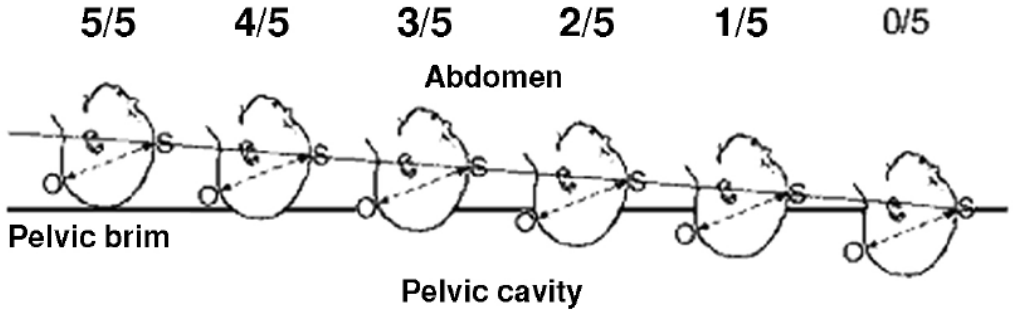
In the active phase, contractions must be three or more in 10 minutes, each lasting 40 seconds or more.

A woman is said to be in active labour if she has regular contractions leading to progressive dilation of the cervix. Once the active phase of labour has commenced, start a partograph.

Using the partograph

The WHO partograph has been modified to make it simpler and easier to use. The latent phase has been removed and plotting on the partograph begins in the active phase when the cervix is 3–4 cm dilated. Note that the partograph should be enlarged to full size before use. Record the following on the partograph:

- **Patient information:** Fill out name, gravida, para, hospital number, date and time of admission and time of ruptured membranes.
- **Fetal heart rate:** record every half hour.
- The first entry on the partograph is made on the '0' hours timeline and subsequent entries are related to that line.
- **Amniotic fluid:** record the colour of amniotic fluid at every vaginal examination:
  - □ I: membranes intact
  - □ C: membranes ruptured, clear fluid
  - □ M: meconium-stained fluid
  - □ B: blood-stained fluid
- **Moulding:**
  - □ 1: sutures apposed
  - □ 2: sutures overlapped but reducible
  - □ 3: sutures overlapped and not reducible
- **Cervical dilatation:** assessed at every vaginal examination and marked with a cross (X).
- **Alert line:** a line starts at 4 cm of cervical dilatation to the point of expected full dilatation at the rate of 1 cm/hour.
- **Action line:** parallel and 4 hours to the right of the alert line.
- **Descent assessed by abdominal palpation:** refers to the part of the head (divided into five parts) palpable above the symphysis pubis; recorded as a circle (O) at every vaginal examination. At 0/5, the sinciput (S) is at the level of the symphysis pubis.



Completely above	Siniciput high, Occiput easily felt	Sinciput easily felt, Occiput felt	Sinciput felt, Occiput just felt	Sinciput felt, Occiput not felt	None of head palpable

- **Hours:** refers to the time elapsed since onset of active phase of labour (observed or extrapolated).

- **Time:** record actual time.
- **Contractions:** chart every half hour; palpate the number of contractions in 10 minutes and their duration in seconds.
  - □ less than 20 seconds: ☐
  - □ between 20 and 40 seconds: ▒
  - □ more than 40 seconds: ■
- **Oxytocin:** record the amount of oxytocin/volume intravenous fluids in drops/minute every 30 minutes when used.
- **Drugs given:** record any additional drugs given.
- **Pulse:** record every 30 minutes and mark with a dot (.).
- **Blood pressure:** record every 4 hours and mark with arrows.
- **Temperature:** record every 2 hours.
- **Protein, acetone and volume:** record every time urine is passed.

Points to Remember

- If a woman is in latent phase of labour for longer than 8 hours, re-evaluate the woman, consider whether she is in labour and provide the necessary support. Consider keeping her at the health facility in the ANC until in true labour.
- The active phase is from 4 cm to 10 cm and dilatation of the cervix should be at least 1 cm/hour.
- When progress of labour is normal, the graph showing cervical dilatation will not cross to the right of the alert line.

Failure to Progress

Failure to progress in labour may be because of problems with the:

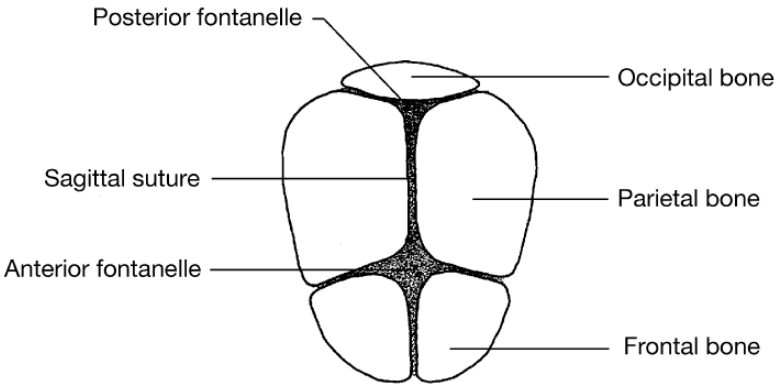
Powers: Contractions inadequate (dysfunctional labour)

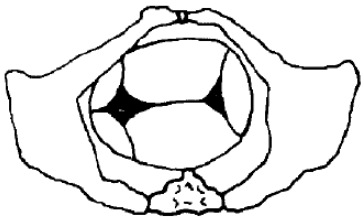
Passage: Pelvis too small for baby (cephalopelvic disproportion, obstructed labour)

Passenger: Position wrong or baby too large for pelvis (cephalopelvic disproportion, obstructed labour or malposition)

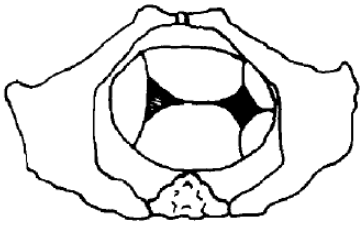
It is very important to decide which of the three causes contribute to failure to progress so that the appropriate action is taken.

Illustration of position of fetal head

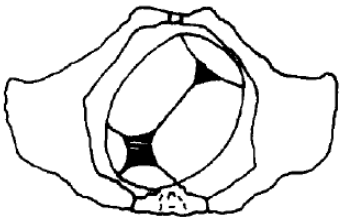




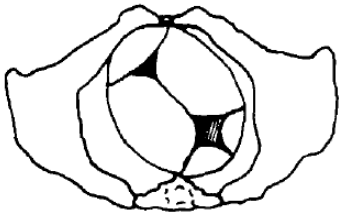
Left occiput transverse



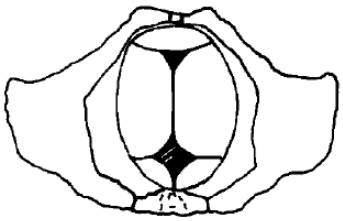
Right occiput transverse



Left occiput anterior



Right occiput anterior

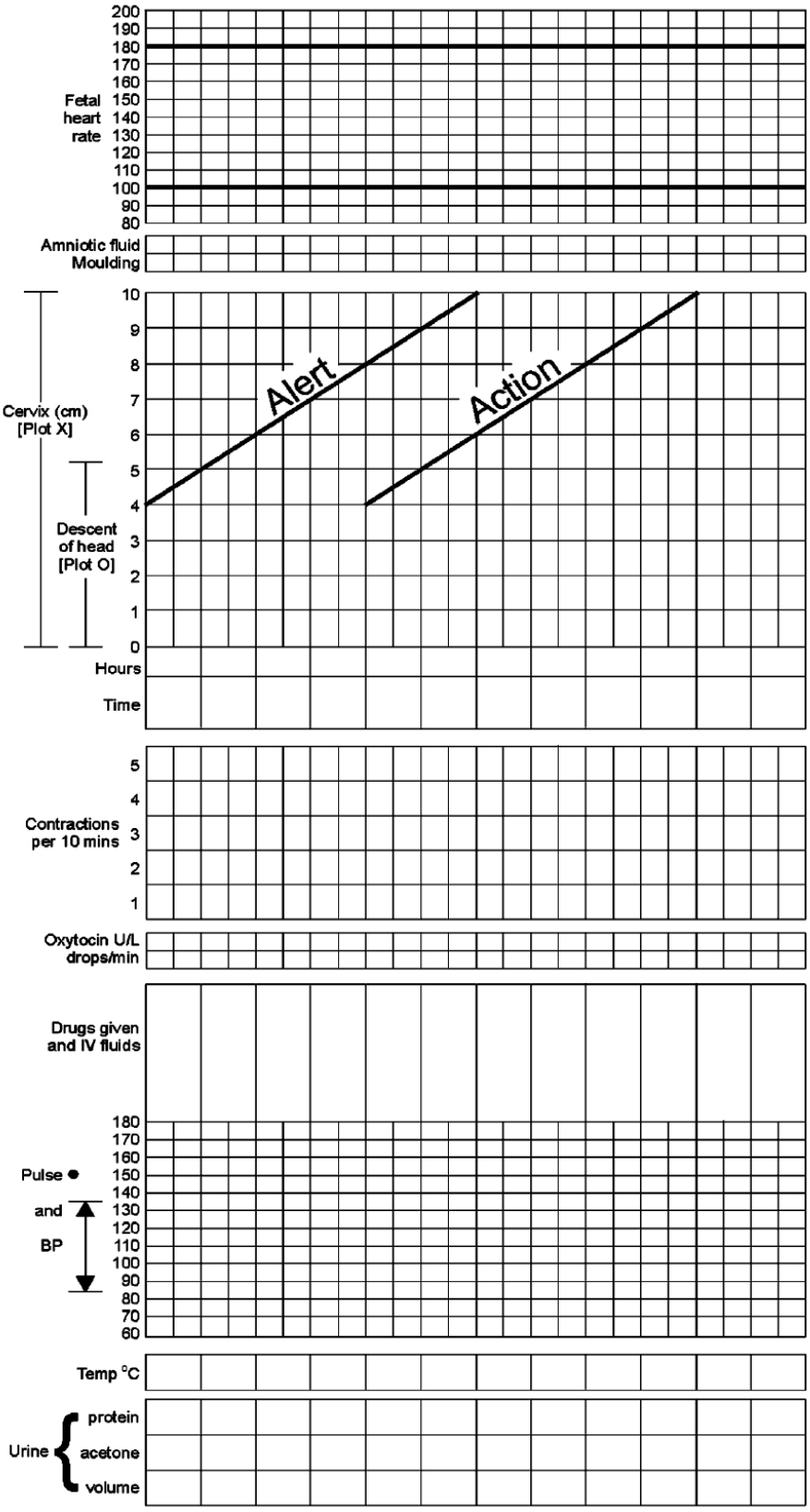


Occiput anterior

The modified WHO Partograph

Name Gravida Para Hospital number

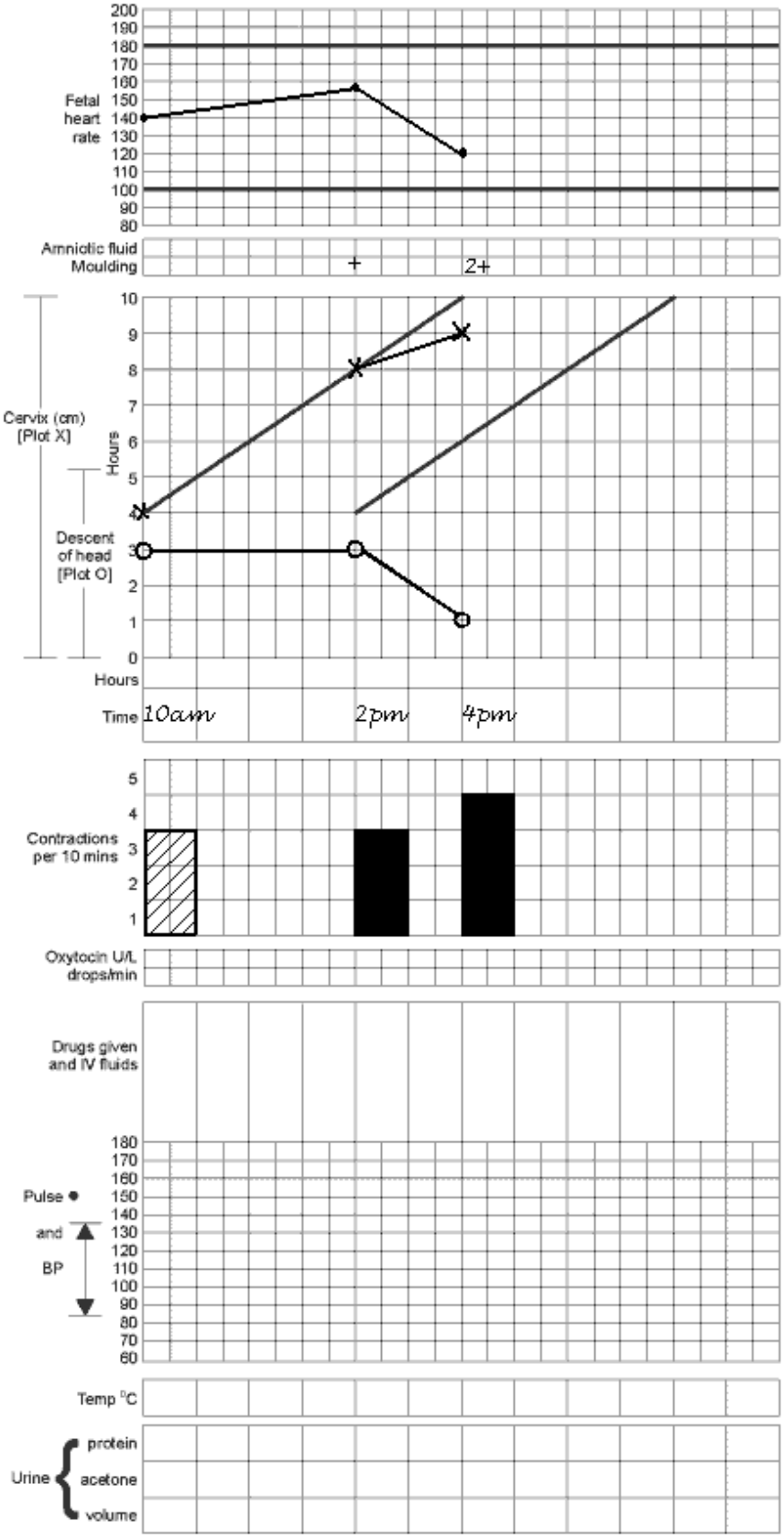
Date of admission Time of admission Ruptured membranes hours



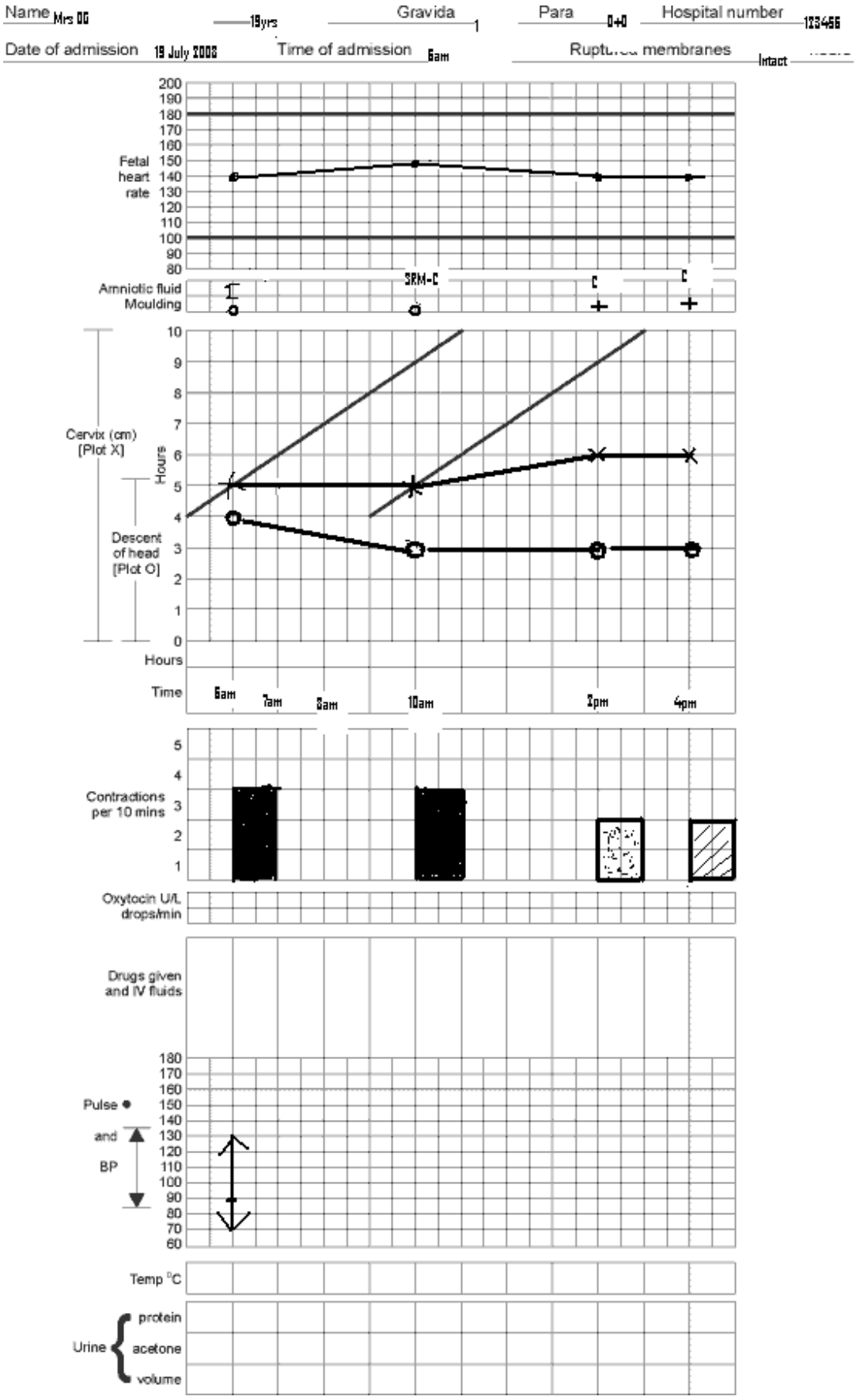
Failure to progress

Name Mrs. SA Gravida 4 Para 3^{+1} Hospital number 1234

Date of admission 09.08.08 Time of admission 10am Ruptured membranes 2 hours



Dysfunctional Labour and Secondary Arrest



APPENDIX 2

Demonstration of ABCD scenario Script

Commentator	We are now going to demonstrate for you how the ABCD approach can be put into practice.
	Throughout the course we are going to be teaching you to use the **ABCD** method so that you are able to use it when you go back to your workplace.
	During the course we will be helping you to put the method into practice by giving you prompts.
	Midwife is looking after a **patient,** 36 weeks pregnant, who suddenly starts to fit.
Midwife	Doctor, come quickly, this patient is fitting!
	Patient fits briefly then stops.
Midwife	She has stopped fitting.
	Patient – noisy obstructed airway.
Doctor	'Hello, hello Mrs Tilt' – She is not responding to me so I am worried about her airway and breathing.
	Can we give her a left-lateral tilt? (This is done)
	She may have an obstructed airway as she is not responding and grunting like that. I will look and feel as well as listen for noisy breath sounds.
Midwife	She is blue around the lips.
Doctor	I feel no movement of air.
	I will try a simple manoeuvre: the head tilt and chin lift.
Commentator	This improves the movement of air in and out of the mouth but the chin drops back and the airway becomes obstructed again.
	Jaw thrust is tried and let go.
	The same thing happens.
Doctor	I will try an oropharyngeal airway.

Commentator	This makes breathing much easier.
Doctor	I would put the mother on oxygen if it was available.
	I would like to examine her breathing. I would look and listen with a stethoscope.
Commentator	You hear some crackles.
Doctor	I would put the patient into the recovery position
	Doctor places the patient in the recovery position
	Patient starts to regain consciousness.
Patient	I can't breathe. I want to sit up.
	Midwife and **doctor** sit her up. **Patient** is now breathing but very breathless. Doctor asks the midwife for oxygen and starts high flow oxygen
Patient	I have a terrible headache.
Doctor	I would like to assess circulation.
Commentator	How do you do that?
Doctor	I am assessing: ■ skin ■ level of consciousness ■ heart rate ■ blood pressure ■ urine output
Commentator	How would you evaluate the level of consciousness?
Doctor	A – Alert V – Responds to voice P – Responds only to pain U – Unresponsive

Discussion

The purpose of getting the learners to think about and analyse the discussion is for them to start to think about the ABCD system and to reinforce the use of it.

Go round the delegates consecutively. Do not spring a question on an individual, particularly at this stage, as they are very new to the course and will be very nervous. Let it be obvious to them that their turn is coming. Let an individual say two or three things and then move on to the next person. If they appear to not have anything to say just politely move on to the next person.

First, ask for things that could be improved upon. Do this along the ABCD lines, looking for comment first on the assessment of each area and then on the management of each area.

What was good about the assessment of the airway?

Expect observers to confirm that the team:

- recognised that noisy breathing meant the airway might be partly obstructed
- did look, listen, feel
- recognised that the airway was partly obstructed.

What was good about the management of the airway?

Expect observers to confirm that they:

- performed head tilt, chin lift
- recognised that this worked but that when let go, the airway became obstructed again and decided to put in oropharyngeal airway
- put on oxygen
- recognised that, as the level of consciousness reduced, the patient may not have reflexes to protect her from aspiration but they realised that airway was, for the moment, patent.
- Emphasise that a blocked airway can kill the patient within 4 minutes and therefore any airway problems should be treated first

What was good about the assessment of breathing?

Expect observers to confirm that they:

- did look to see if patient was breathing
- did listen for noisy breathing
- listened with stethoscope to check air entry and breath sounds and other sounds, such as crackles.

What did you think about the way breathing was managed?

Expect observers to confirm that they sat her up and commenced oxygen.

What was good about the assessment of circulation?

Expect observers to confirm that they:

- checked her colour, whether she was cold or warm, whether she was anxious or confused
- checked her pulse
- checked her blood pressure.

Blood pressure should be mentioned last, as you want to get the participants into the habit of realising that a fall in blood pressure is a late sign and they should look for the other (sometimes subtle) signs first.

Was the assessment of D correct?

- What is the distinction between the left lateral tilt and the recovery position?

APPENDIX 5

Equipment checklist for breakout stations

Room 1

- □ Airway head (and model of larynx)
- □ Bath towels x 4 (or any local amount used during labour to mop/clean blood)
- □ Blood sample bottles
- □ Blood pressure cuff
- □ Baby models x 2
- □ Cannulae of various sizes
- □ Cusco vaginal speculum or Auvard vaginal speculum
- □ Cushions
- □ Felt pens and wipes or pencils and rubbers
- □ Flipchart/whiteboards and pens or blackboard and chalk
- □ Foley urinary catheter
- □ Giving set
- □ Green drapes x 2
- □ Intravenous fluid (5% dextrose, ringer lactate, physiological saline)
- □ Karman syringes and cannulae
- □ Kiwi cup/omnicup/procup/reusable x 2
- □ Laminates with Blutac – saying ‘not much to show’ and ‘going to die’
- □ Lucy and Lucy’s Mum model
- □ Mechanical ventricular DVD
- □ Obstetric forceps x 2
- □ Oropharyngeal airway
- □ Partographs – laminated or photocopied
- □ Patella hammer
- □ Pelvic models x 2
- □ Pinard fetal stethoscope
- □ Plastic water bottles 0.5l x 10
- □ Pocket mask
- □ Self-inflating bag and mask (e.g. Ambu bag and mask)
- □ Sponge holding forceps or ovum forceps
- □ Spontaneously breathing oxygen mask
- □ Stethoscope
- □ Syringes
- □ Tenaculum
- □ Thermometer
- □ Vulsellum
- □ Yankauer sucker
- □ Zoe gynaecological stimulator

Room 2

- □ B-Lynch suture posters
- □ Blood sample bottles
- □ Bony pelvis with fetal skull
- □ Blood pressure cuff
- □ Cannulae of various sizes
- □ CPR torso (Little Anne) x 2
- □ Cushions
- □ Drapers
- □ Felt pens and wipes or pencils and rubbers
- □ Fetal model x 2
- □ Flipchart and pens/blackboard and chalk
- □ Foley catheter
- □ Giving set
- □ Intravenous fluid (5% dextrose, ringer lactate, physiological saline)
- □ Lucy's Mum & Lucy model
- □ Monitoring charts
- □ Omnicup/Procup/Malstrom vacuum extractor x 2
- □ Oropharyngeal airway
- □ Partographs – laminated or photocopied
- □ Pelvic models x 2
- □ Pictures of bimanual compression and aortic compression
- □ Pinard stethoscope
- □ Pocket mask x 2
- □ Patella hammer
- □ Retained placenta models x 2 (knitted/feir placenta models)
- □ Rusch balloon (or Foley catheter with condom)
- □ Self-inflating bag and mask (e.g. Ambu bag and mask)
- □ Spontaneously breathing oxygen mask x 2
- □ Stethoscope x 2
- □ Syringes
- □ Thermometer
- □ Urine dipstix
- □ Wall poster on use of magnesium sulphate
- □ Yankauer sucker

Room 3

- □ Blood sample bottles
- □ Blunt curette for evacuating products of conception
- □ Blood pressure cuff
- □ Cannulae of various sizes
- □ Clock x 2
- □ Cushions
- □ Drapers
- □ Felt pens and wipes or pencils and rubbers
- □ Fetal model with cord
- □ Foley urinary catheter
- □ Intravenous fluid (5% dextrose, ringer lactate, physiological saline)
- □ Monitoring charts
- □ Omnicup/Procup/Malstrom vacuum cleaner x 2/La Vacca model
- □ Oropharyngeal airway
- □ Paediatric self-inflating bag and mask x 2 (e.g. Ambu bag and mask)
- □ Partographs (laminated or photocopied)
- □ Pelvic model and fetal doll x 2 or Lucy's Mum and Lucy
- □ Pinard stethoscope
- □ Reflex hammer
- □ Resusci Baby x 2
- □ Retained placenta models x 2
- □ Rusch balloon (or condom with catether)
- □ Spontaenously breathing oxygen mask
- □ Stethoscope x 2
- □ Syringes

Room 4

- □ Anticoagulation labels
- □ Artery forceps x 8
- □ Baby
- □ Blades no. 10 or 15 x 8
- □ Blood sample bottles
- □ Blood pressure cuff
- □ Cannulae of various sizes
- □ Cushion/wedge
- □ Disposable surgical gloves
- □ Dissecting forceps
- □ Episiotomy scissors
- □ Episiotomy/perineal repair model
- □ Fetal models x 4
- □ Flipchart and pens or blackboard and chalk
- □ Forceps (for 'lift out')
- □ Giving set
- □ Intravenous fluid (5% dextrose, ringer lactate, physiological saline)
- □ Mosquito artery forceps x 8 (or curved artery forceps)
- □ Needle holders
- □ Oropharyngeal airway
- □ Paper towels or tissue wipes
- □ Pelvis models x 2
- □ Pinard stethoscope
- □ Scalpel no 3 x 8 (disposable scalpel, with blades if available)
- □ Sharps box x 2
- □ Spontaneously breathing oxygen mask
- □ Stethoscope
- □ Stitch scissors
- □ Sutures 2/0 vicryl rapid with strong needles
- □ Syringe labelled 'local anaesthetic'
- □ Syringes (with different antibiotic labels)
- □ Thermometer
- □ Urinary catheter
- □ Venflon 16-gauge or 18-gauge x 8
- □ Vicryl 2/0 or chromic 2/0 or linen thread/cotton x 1 roll and needles
- □ Yankauer sucker

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