Advanced Comprehensive Obstetric, Anaesthetic and Newborn Care

A Manual for Facilitators

Produced by

LSTM
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Introduction

This course has been designed to address a need for improvements in comprehensive obstetric care provision for women and babies, with a particular focus on surgical decision making and skills in obstetric practice.

The course is structured in a manner similar to that of the Life Saving Skills Essential Obstetric Care and Newborn Care Course developed by the Liverpool School of Tropical Medicine and the Royal College of Obstetricians and Gynaecologists in 2007 and since delivered in many countries in Sub Saharan Africa and Asia.

The structure is based on brief lectures followed by a series of related breakout activities. Participants rotate through each of the breakout activities in small groups, with an emphasis on hands on experiential learning, by means of scenario and practical skill sessions. Learning is further enhanced by brief films and interactive workshops.

Pre- and post-course assessments are conducted to assess learning throughout the course.

How to be a good facilitator

1. This course is very intensive and facilitation can be tiring. All the facilitators need to work well together as a team to ensure that every session is well prepared with all relevant equipment laid out ready for the participants and cleared away afterwards ready for the next session. Please be willing to help each other out throughout the day. If a co-facilitator is lecturing, you could help to prepare their next breakout session.

2. Make good preparations and be familiar with the content of the sessions you are teaching. It is essential that facilitators teach accurately and to a high standard so that participants learn well. The course is very full and participants may find it hard to remember everything that they have been taught. If it has not been taught accurately this may cause participants to become confused and lead to them providing sub-optimal care to patients.

3. Be aware of safety. Handle sharps such as needles and knife blades with care. Ensure they are disposed of in safe containers provided at the end of each session.

4. Always welcome participants to each session. At the start of the session, be sure to share the learning objectives with the group so they appreciate the focus of the session. Similarly, at the close of the session remind the participants of the most important learning points before they leave. The course administrator will have given you a five-minute warning prior to the “time up” notification, and this is a cue to start closing the session. It is best to use at least the final two minutes in summarising so that participants leave with a clear idea of what they have learned.

5. Try to involve all participants and encourage them to take an active part in the sessions. You may need to use both verbal and non-verbal body language techniques to achieve this. If a participant is tending to dominate, simply avoiding eye contact, or holding out your palm to stop them usually works, whilst looking towards another participant and encouraging them to speak. If the more dominant participant does not get the message, you could politely say something like “thank you so much, you have answered well but let us just hear from one of your colleagues this time,” or words to that effect.

6. If a participant is very hesitant and does not seem to know the answer, do not embarrass them but say to the other participants “Can anyone else help here?”

7. When a participant gives a correct answer or takes the right action, give encouragement and affirmation, say “Well done, that’s the right thing to do”.

8. If participants leave out something important, do not let it pass but ask them to think about what they might have left out. In applying a structured approach to dealing with obstetric emergencies it is always important to do so in a systematic way, to ensure that nothing important gets forgotten. In this way good behaviour patterns will become reinforced and become automatic behaviours in an emergency situation. Always remember to be gentle and use good humour when correcting participants and avoid any possible humiliation.

9. When teaching in skills sessions, it is important to allow sufficient time following your demonstration to enable all the participants to practice. If a participant is struggling to acquire the skill it is best to offer them a one-to-one session at another time, (for example, over the lunch break).

10. Please support the course director throughout the course. They have may ask you to change sessions at short notice if another facilitator is unavoidably absent, so please be ready to be flexible if necessary.
11. Always set a good example to participants. To a large extent they will model their behaviour on the behaviour they observe from you. This means that you should always be punctual and keep to time. Please observe good phone discipline and only use you phone during designated break times, and remain polite, patient, courteous and professional.
12. Be friendly to the participants. Time invested in chatting to them during the breaks will pay dividends. If participants relate well to the facilitators they will enjoy the training and learn well.

Lectures

1. The lectures have been pre-prepared, in accordance with the best available evidence, and it is important that facilitators stick to the content of the lecture slides and also that they keep to the allotted time. This may be best achieved by practicing the lecture beforehand.
2. Ensure that you speak sufficiently audibly for participants seated at the back to hear you easily. Always look out at the audience and avoid looking at the screen behind you unless you particularly want to point something out on a slide. The laptop will be showing the same slide as the one on the screen behind you – trust it and keep looking forward! If you turn away you will lose contact with your audience and they will stop concentrating.
3. Try to paraphrase rather than simply read out the slide out. If time allows you can add examples to illustrate a point.
4. Position yourself so that you do not block the screen and all participants can see it.
5. It is good to ask occasional questions to keep participants engaged, but this must be tempered by the need to keep to time and allow for participants to ask any questions at the end. If you are asked a question, repeat it if necessary to ensure all the other participants have heard it before answering. If you don't know the answer, please be honest and say so. Do not make it up but rather say that you don't know but that you will find out for them or ask if any of the rest of the faculty can help.
6. Be familiar with the use of the laptop and PowerPoint presentations. If unsure ask the Course Director who will help you with this on the preparation day. Be ready to continue teaching in the event of a power-cut. Have a printed copy of the lecture slides with you.

Module 1: Leadership and Management

Labour Ward management breakout sessions

1.1 The progress board, prioritisation and planning | Workshop

Equipment

- ☐ Print-outs of the progress board below (or project it on a screen)

Key learning objectives

- To learn how to prioritise care of patients on a busy labour ward, within the constraints of available resources

Instructions for the facilitator

This session is run as a group discussion around the questions outlined below.

Explain to participants that they are the health worker in charge of the labour ward. It is 08:00 am and they have just taken over from the night shift.

The progress board is as shown in Table 1.1.1

- There are 4 qualified midwives on duty
- There is one Intern doctor who has only started 2 weeks ago
- There is one junior resident and one senior resident (themself)
- A consultant is on-call but busy in the gynaecology theatre
- Ask the participants to consider the progress board and then discuss the questions

This session is about weighing up competing priorities and encouraging the participants to triage based upon the patients with the most immediate and life-threatening problems. Work through each case in turn but encourage the participants to consider their plans based upon the needs of all the patients, not just the one they are considering at the time. Tell the participants they must decide on the order of priorities, based upon the risks for each patient. This is key to the safe running of a busy labour ward.

- What stands out from the information available on the progress board?
- What are the risks to this patient?
- What immediate tasks must be done?
- What else do they need to know about each patient?
- What care is needed for each patient?
- Who should be with which patient?
- How would they distribute the available staff?

Taking into consideration all these patients, ask participants to consider how to prioritise and delegate tasks. Do they need extra help? Where might they get any additional help from?

Table 1.1.1: The progress board

Bed	ID	G/P	Gest.	Membranes	Dilation	Comments	Consultant
1	JK	G2P1	38	Intact	1 cm @07:40	APH 500 mls Pain ++ FH 160/min	HM
2	SS	G4P3	41	Clear liquor	3 cms @ 06:00	3 previous CS	RK
3	AO	G1P0	40	Clear liquor	8 cms @ 06:50	No progress in 4 hours	PT
4	YA	G1P0	30	Intact	0 cms @ 07:30	Eclampsia	AM
5	BM	G2P1	39	Meconium	10 cms @ 07:45	Urge to push	RK
6	YK	G4P3	41	Intact	6 cms @ 06:10	Normal labour	PT
7	HA	G1P0	27	Intact	1 cm @ 05:00	Fever, back pain	HM
8							
9							
10							

Ensure the following points are included in each case discussion: risks, immediate tasks, information required, care needed.

Case 1

Probably experiencing a placental abruption. There is a borderline fetal tachycardia.

Risks: Extension of the abruption, fetal death in utero, maternal shock. Further blood loss may be concealed.

Immediate tasks: IV access must be secured, and blood cross-matched. ABC assessment is urgent.

Information required: Vital signs ABCDE.

Care needed: This patient is likely to need delivery in the next hour by Caesarean section.

Facilitator: Who will you ask to do what and when?

Facilitator: Who needs to be informed?

Case 2

This patient has a scar that could easily rupture. She has ruptured membranes.

Risks: Scar rupture, fetal distress.

Immediate tasks: ABCDE and I.V. access.

Information required: Is she in the active first stage of labour? Does she need to be examined again and when? What are her observations? What is the fetal heart rate?

Care needed: This patient needs to be delivered by caesarean today.

Facilitator: Who will you ask to do what and when?

Facilitator: Who needs to be informed?

Case 3

This patient is a primigravida who is not progressing and has crossed the action line. Her membranes are already ruptured.

Risks: Obstructed labour, fetal distress.

Immediate tasks: Assess suitability for augmentation.

Information required: What are her contractions like? Are her observations and the fetal heart rate normal? Is she suitable for oxytocin augmentation? If so, is it safe to do this now, taking into account the big picture of the labour ward?

Care needed: Augmentation if suitable and safe.

Facilitator: Who will you ask to do what and when?

Facilitator: Who needs to be informed?

Case 4

This patient is 30 weeks and has eclampsia.

Risks: Airway obstruction, hypoxia, aspiration.

Immediate tasks: ABCDE diagnose and treat A then B then C in turn.

Information required: Is her airway secure? What are her observations? Has she been given oxygen? Has intravenous access been secured?

Has she been started on Magnesium Sulphate? What about steroids for fetal lung maturation?

Does she need antihypertensive medication?

Care required: 1 to 1 care. When should she be delivered and how?

Facilitator: Who will you ask to do what and when?

Facilitator: Who needs to be informed?

Case 5

This is a multiparous patient who is likely to deliver very soon. There is meconium in the liquor so preparations should be made for the possibility of neonatal resuscitation.

Risks: Meconium aspiration for the baby.

Immediate tasks: Assess fetal heart rate.

Information required: What is the fetal heart rate? Does she need assisted vaginal delivery? How quickly is the presenting part advancing?

Care needed: What sort of care does she require? By whom?

Facilitator: Who will you ask to do what and when?

Facilitator: Who needs to be informed?

Case 6

This is a multiparous woman in normal labour. As it is her 4th labour she is likely to progress rapidly.

Risks: Rapid delivery.

Immediate tasks: ABCDE maternal and fetal observations.

Information required: What is the fetal heart rate? What are her observations? How did she deliver last time?

Care needed: What sort of care does she require?

Facilitator: Who will you ask to do what and when?

Facilitator: Who needs to be informed?

Case 7

This patient is not in established labour.

Risks: Infection, sepsis.

Immediate tasks: Ensure treatment has been started

Information required: What are her observations? What is the fetal heart rate?

Care needed: What treatment is she likely to need?

Facilitator:

a) Discuss the order of priority based on available resources, with justification, also how staff will be allocated. Emphasize the need for good communication and informing senior clinical staff of the situation.

b) Discuss what participants anticipate to be barriers to using progress boards in the maternity/labour ward of their health facility.

1.2 Handover and referral of patients | Workshop

Equipment

- ☐ Print-outs of the cases for discussion
- ☐ Whiteboard / flip chart and pens

Key learning objectives

- To understand the importance of giving clear concise and structured information to enable continuity of care
- To practise giving a structured handover using the SBAR method

Instructions for the facilitator

Prepare in advance on the flip chart or whiteboard a chart explaining briefly the various components of SBAR, as outlined below.

This session is conducted as a discussion. Ask participants what the feel are the most urgent concerns for these cases and what they think should be done. Ask them to construct an SBAR framed referral/handover from the midwife or intern to the obstetrician for each case, along the lines suggested below, working in pairs.

Ask participants to role play a handover scenario or phone call for referral using the information in the paragraph without using SBAR and then repeat using SBAR. Ask them about the differences between the two presentations.

SBAR

S = Situation

This is like a newspaper headline. It describes in one brief sentence who you are, where you are and what the main and most urgent problem is. For example, “I am midwife D on the labour ward. I have a patient in shock with an on-going post-partum haemorrhage”.

This immediately alerts the listener to the fact that there is a deteriorating problem requiring urgent attention.

B = Background

The background provides relevant background information with a brief pertinent history. In this case it might be:

“This patient is now G3P3. She delivered the baby 40 minutes ago and the third stage was complete 30 minutes ago after active management of the third stage with an oxytocin bolus. Since then she has not stopped bleeding.”

A = Assessment

The assessment contains objective facts, for example the patient's vital signs. In this case; "The patient's BP is 80/55, pulse is 135/minute and respiratory rate 30/minute. Conscious level is alert. The uterus is soft and the fundus high. Vaginal bleeding is continuing.

R = Recommendation

This is what you think needs to be done, and also a summary of what has been done so far. For example, "I need you to come and assess this patient. The patient is receiving oxygen at 10 l/minute and a rapid infusion of Normal Saline. I have catheterised and rubbed up a contraction and commenced an oxytocin infusion, but the uterus keeps relaxing. Another midwife is doing bimanual compression as I speak but I think the patient will require balloon tamponade. Please come now. Would you like me to do anything else as you come?

SBAR: Ask the participants to work on preparing this for themselves in pairs, giving one case to each pair, then ask them to present the case to the other participants, with one participant presenting the information as usual and the other using the SBAR formula. Discuss the differences and ask them which method seems better and what the advantages are. Discuss how similar their SBAR presentations are to the SBAR summaries provided here for each case:

Case 1

Mrs A is a 45-year old mother of 7 live children. In the past she has had three stillbirths. She appears to be significantly under-weight. She is the wife of a farmer and lives in a remote area with poor roads. She has not had any antenatal care and usually delivers at home. She has come to the hospital this time because she had been experiencing contractions for three days and the baby has not been born. She is feeling weak and dizzy. The waters broke on the first day. The midwife did a vaginal examination and felt a lump through the cervix, very high up, that did not feel like a head or a breech. The cervix felt oedematous and was 6 cms dilated. She has not been able to find a fetal heartbeat. The woman has a fever and her temperature is 38.5C, with a pulse of 110/minute and BP of 105/65 and respiratory rate of 30/minute. The contractions have decreased to 1 in 10 minutes lasting 20 seconds.

Situation

"I am midwife C with a patient in bed 3 on labour ward. She has obstructed labour with signs of sepsis."

Background

"This patient is a 45 year-old grand-multiparous patient from a remote area with a poor past obstetric history. She is Gravida 11 Para 10, including three stillbirths. She has not attended for any antenatal care in this pregnancy and came today after failing to deliver despite contracting for three days."

Assessment

"The patient's vital signs are: Respirations 30/minute, Pulse 110/minute, BP 105/65, Conscious level Alert, Temperature 38.5C. Contractions are currently 1 in 10 minutes and lasting 20 seconds. On

vaginal examination the cervix is 6 cms dilated and the presenting part is high. I think it might be a shoulder presentation. I cannot find a fetal heart beat and I think the fetus may have died. "

Recommendation

"I have gained IV access. I need you to come and assess the patient. I think she needs to be delivered. Is there anything else I should do as you come?"

Case 2

Miss B is a 16 year-old unmarried primigravid patient. She was admitted after having convulsions at home. Her family told you that she had been complaining of a severe headache before collapsing to the floor where her whole body appeared to jerk uncontrollably for a few minutes. The convulsing stopped spontaneously but after that she was very drowsy and difficult to rouse and she has not been speaking since then. The family were unaware of a pregnancy but her mother had been suspicious because the girl had appeared to be gaining weight over the past couple of months. She has not discussed this with the girl and is very worried about what her father will say if she is pregnant. On examination the respirations were 26/minute, pulse 80/minute and BP 175/120. The temperature was 37C and the conscious level P. She has had another convulsion a few minutes ago. Her fundal height is 32 cms.

SBAR

Situation

"I am intern M on the labour ward. I have a patient with suspected Eclampsia."

Background

"The patient is a 16 year-old primigravda with a concealed pregnancy. Her family report she experienced a severe headache today and then she collapsed and convulsed. Since then she has not been able to speak and since she arrived she has had another grand-mal convulsion."

Assessment

"The patient's vital signs are: respiratory rate 26/minute, Pulse 80/minute and BP 175/120. Her temperature is 37C and her conscious level is P, responding to pain. The fundal height is 32 cms and the fetal heart is 130/minute."

Recommendation

"Please come and take over care of this patient. I have gained I.V access and given a loading dose of Magnesium sulphate and 5 mgs hydralazine intravenously. The patient has been catheterised and the urine has 4+ of protein. I think this patient should be delivered within 12 hours due to eclampsia. Is there anything else I should do now?"

Case 3

Mrs C is a primigravid woman aged 23 years. She is 41 weeks gestation and was admitted with a history of contractions for 6 hours, now occurring every 2 minutes and lasting for 60 seconds. It took her 14 months to conceive and in her pregnancy she experienced a threatened miscarriage at 11 weeks. She is crying with pain and unable to stay still on the bed to be examined. Her husband is with her but he is sitting in the corner looking embarrassed and not engaged. All her vital signs are normal but the midwife is unable to auscultate the fetal heart for a full minute due to the patient's distress but thinks she heard it at 130/minute. Talking to the patient and telling her to be quiet and settle has had no effect. The intern has also tried with no success.

SBAR

Situation

"I am intern A on the labour ward. I have a patient in great pain and distress who I cannot examine."

Background

"This patient is a 23 year-old primigravid woman with a history of primary infertility and threatened miscarriage in the first trimester. According to her dates she is 41 weeks and she has been experiencing painful contractions for 6 hours. Her husband is present but not supportive."

Assessment

"The contractions have a frequency of 5 in 10 minutes and are lasting for 60 seconds. Her vital signs are all normal. I cannot assess her cervix or palpate her abdomen due to her distress. The fetal heart was heard very briefly but I think it is normal at 130/minute."

Recommendation

"Please can you come and prescribe some analgesia for this woman to enable the management of her labour. Is there anything else I can do now?"

1.3 Labour ward environment and teamwork | Workshop

Equipment

- ☐ Whiteboard / flip chart + pens

Key learning objectives

- To appreciate how both physical and cultural structure of the labour ward impacts on outcomes

Instructions for the facilitator

This breakout is a discussion led by the facilitator.

Prepare a chart on your flip chart or white board as shown on the next page.

Appoint a scribe from within the group and ask the group to discuss each point in turn and complete the chart.

Ask the group to think of the labour ward where they work and discuss whether the elements they have identified are present or not.

Ask them to discuss what changes they may be able to make to improve their labour ward environment.

Ask them to discuss how their labour ward should be structured to improve team work and patient safety.

Hints for discussion

- Is the labour ward an environment where women can be provided with privacy and space for a birth supporter of their choice to be present, whilst not compromising the privacy and confidentiality of other labouring women? If not, what could be done to change this?
- Are there adequate comfortable chairs and/or beds for women to rest when they are tired?
- Are arrangements in place for food and water for labouring women?
- Does the labour ward structure allow for safe monitoring of patients, including all patients but especially those at high risk?
- Is there an admission suite where women are assessed on arrival before being admitted to the labour ward?
- What equipment is available on the labour ward for maternal and fetal monitoring?
- Are there emergency boxes or trolleys available for managing eclampsia and PPH? Where are they kept? Who is responsible for checking and replenishing?
- What oxygen supply is available?
- Is there a labour ward blood fridge? What is in it? Is there a readily available supply of Group O Rhesus negative blood?
- Are there protocols kept on the labour ward e.g. for labour augmentation?

- Is there a staff area for handover with a progress board? Are there chairs for staff to sit down for rests or during handovers?
- Is there a call-bell system for patients or supporters to call staff?
- Other issues may also come up in the course of your discussion. The emphasis should be on changes that may need to be made to improve the labour ward environment in terms of facilitating safety, comfort and teamwork.

What do women and SBAs need?

Table 1.3.1: What do women and SBAs need?

	Women and supporters	**Skilled birth attendants**	**Others, e.g. anaesthetists**
(A) On admission			
(B) In latent phase			
(C) In active first stage			
(D) In second stage			
(E) In the event of emergency			

1.4 Respectful care on the Labour Ward | Workshop

Equipment

- Laminates of the case study
- Whiteboard / flip chart and pens

Key learning objectives

- To encourage health professionals to consider how to provide respectful, compassionate care to women (especially young women and girls) who are in labour
- The importance of privacy and dignity in caring for those who may be frightened and distressed, as this may otherwise result in severe consequences including birth-related injury or death of the mother and her baby

Instructions for the facilitator

This case study explores the responsibility of health professionals to provide respectful care for women in labour.

Tell the participants that we will now review a case looking at the interaction between the woman and service provider and the behaviour of the service provider.

Please ask a member of the group to read out the case study.

Once it has been read out, turn to the 'Questions to be considered'. Use the prompts if you need to, to engage participants in discussion but if the group engage in the discussion, do not feel you must use them. Try to ensure all members of the group are included and encouraged/invited to share their thoughts and ideas.

Spend 15-20 minutes facilitating the discussion of the questions.

Finish the session by asking what the key learning points are and what would be useful to include in a future interaction and behaviour of the service provider on respectful care.

Case study

Bemi, a young woman from a rural area, became pregnant at the age of 17 years following a rape and attended her local Health Centre for Antenatal Care. There were many women at the clinic and she had to wait for several hours to be seen by the midwife. The midwife told Bemi that she should bring her husband with her to her next appointment. Bemi had a rapid diagnostic test for HIV which was positive. The midwife told her that she had HIV and would need to go to the hospital for medication. Bemi requested that the midwife treat her at this health centre as she felt shy about disclosing this result at another hospital. The midwife told Bemi that she should have thought about that before she slept around with men and became infected. Then the midwife ignored her.

After waiting in expectation of some treatment and care, Bemi left the health centre and never went back for further antenatal care. At 35 weeks, she went into labour. Although she was afraid she might see the same midwife again, she managed to walk the 4 miles to the Heath Centre in labour.

When she arrived, she was told to wait to be seen. There was nowhere to wait in private, just the open corridor. There was a wooden bench but several others were sitting on it and there was no room for Bemi.

Eventually Bemi was seen by the midwife, who told her to open her legs so that she could examine her. Bemi was frightened and clamped her knees together and the midwife roughly pulled them apart. Bemi was not given a sheet to cover herself with and there were no curtains around the bed so other patients, staff and students could all see Bemi being examined. The examination was rough and very painful. When Bemi cried out, the midwife slapped her and told her that she had not cried in such a way when she conceived. After that the midwife left Bemi alone. The other women in the labour ward delivered their babies and were moved to the postnatal ward. Night fell and no-one returned to see Bemi. She was very frightened but she was in too much pain to get up and look for someone to help. She developed an urge to push but there was no one to tell her what to do. At 04:00 a.m. she delivered a baby alone. The baby did not cry or move. Shortly afterwards, Bemii started to bleed. By the time staff came back in the morning, Bemi was unconscious, lying in a pool of blood.

Questions for consideration

1. **What are your first impressions of this case?**

   Allow time for participants to give their views on the case, which may reveal different levels of understanding about high quality respectful care towards women in labour.

2. **What should health professionals have identified as priority risk factors in this case?**

   Allow time for participants to respond but if required, prompt them with:

   - Bemi has been the victim of rape
   - Bemi's age and HIV status
   - Bemi's lack of follow-on antenatal care visits
   - Single

3. **How could the midwives have behaved differently?**

   If required, prompt participants with:

   - With gentle questioning found out the circumstances of the conception and provided support
   - Appreciated how frightened she was
   - Made sure that HIV treatment was provided in an accessible way for Bemi
   - Treated Bemi with kindness and compassion, especially as a victim of rape
   - Offered counselling/support or explained where she could get this if available because of the rape
   - Made sure Bemi had tests and/or treatment for other STIs and she understood why
   - Created a private space
   - Not physically abused Bemi when conducting an examination
   - Shown patience and awareness of how frightened Bemi is
   - Treated Bemi as a high-risk patient

- Monitored Bemi and her baby using observation chart and partograph
- Not left Bemi alone during the night (abandonment)

4. **What system changes could be made to reduce the risk of this happening to anyone else?**

    - Institutional guidelines for treatment of rape victims in place
    - Integrated ANC and HIV/Syphilis treatment in place
    - Policy on non-discriminatory treatment
    - Zero tolerance for violence to patients with notices and pictures so patients know what to do if this happens and who to complain to
    - Labour ward staffing policy
    - Care in labour policy
    - Disciplinary process for negligent care
    - Process for serious incident investigation
    - Adequate labour ward staffing
    - Compulsory training on respectful care for all staff

5. **What are the key learning points from this case?**

    Refer to the learning objectives.

Module 2: Making decisions in Labour

Partograph and decision-making breakout sessions

2.1 Making decisions: Interpretation of the partograph 1-4 | Workshop

Equipment

- ☐ Laminated partographs and pens
- ☐ Laminated progress in labour algorithms
- ☐ Laminated case studies

Key learning objectives

- Understanding and interpreting the partograph is key to taking timely action
- Appreciating that timely decisions when acted upon promptly improve outcomes
- Learning the significance of abdominal descent of the presenting part in decisions in the second stage of labour

Instructions for the facilitator

This series of breakout sessions focuses on decision-making in labour, using the partograph as a tool to aid decisions. Please ensure that participants fill in the partograph correctly as you go along and also lead a discussion as to the overall care required for the mother and fetus. The participants should do the following for each scenario at each examination plot the findings on the partograph and discuss:

1. Should the labour continue?
2. When should this patient be examined again?
3. Should I recommend any additional actions?
4. Should I recommend delivery now?
5. How should delivery be done?
6. Use the appropriate algorithms to aid making decisions.

The comments regarding each case below should guide the facilitator as to the main points to bring out in the discussion throughout the progression of the case. Try to frame the discussion so that participants are asked questions rather than just telling them these points. **Use the progress in labour algorithms to aid making decisions.**

You may need to revise filling in the partograph correctly with participants prior to looking at the cases depending upon their level of experience.

Case 1

G3 P2, 41 weeks, previous normal deliveries, 37 years

Table 2.1.1: Partograph – case study 1

Time	Dilation	Descent	Contractions	Fetal heart	Maternal Observations	Other
08:00	4 cms	4/5	4 in 10 minutes Lasting 55 seconds	145/minute	BP 115/75 P 85/min RR 19/min T 36.8°C	Clear Liquor Spontaneous onset of labour
12 noon	8 cms	4/5	4 in 10 minutes Lasting 50 seconds	150/minute	Unchanged	Clear liquor
14:00	8 cms	4/5	3 in 10 minutes Lasting 40 seconds	158/minute	BP 120/76 P 110/min RR 24/min T 37°C	Meconium stained

This case concerns a multiparous patient who arrives in spontaneous labour contracting strongly.

Mention that although we cannot measure strength of contractions directly, contractions lasting more than 40 seconds and occurring 4 times in 10 minutes are considered to be strong.

Note that both maternal and fetal observations are normal and reassuring.

The only slight concern is the rather high fetal head, 4/5 palpable in the maternal abdomen. This is not unusual for a multiparous patient, and it is to be expected that descent will occur as labour progresses.

Discuss management in terms of monitoring plans, analgesia and when further examination should be undertaken.

At **12:00** the cervix has reached 8 cms dilated. However there has been no descent, despite good contractions. Emphasise to participants that this is a concern. Multiparous patients who have delivered vaginally previously normally make good progress unless something is wrong. Progress refers to both dilation and descent.

Note that both maternal and fetal observations remain reassuring.

Discuss when the patient should be examined again in the light of your concerns

At **14:00** there has been no further progress. The cervix has not dilated any further and the head has not descended.

Note that although the fetal heart rate remains within the normal range the baseline has risen (145/minute on admission, 158/minute now). This is significant because it suggests that the fetus is secreting catecholamines in response to stress. In addition, fresh meconium has been passed.

Note also the rise in maternal respiratory rate and remind participants that respiratory rate is the most sensitive of the maternal signs.

Although the contractions have diminished in frequency and duration they are still adequate, but even if they were not, it would be wrong to augment this patient. Discuss why she should not be augmented (multiparous, non-reassuring changes in fetal heart, meconium, adequate contractions).

The patient requires delivery by caesarean section. Discuss why (failure to progress despite good contractions, not yet fully dilated, head remains high) and when (aim for delivery within 30-60 minutes) to avoid a deterioration in the fetal condition.

Emphasise that patient has only been there for 6 hours but already it is clear a caesarean is necessary by using the information on the partograph.

Discuss why multiparous labour may not progress. Say that the baby may be considerably larger than babies the patient has given birth to previously, or there may be a malpresentation such as a brow presentation, where a much larger diameter of fetal head is being presented to the maternal pelvis. It is not normal for there to be any problem with contractions in multiparous labour and augmentation with oxytocin is not advised.

Case 2

G2 P1, 38 weeks, previous caesarean, 29 years

Table 2.1.2: Partograph – case study 2

Time	Dilation	Descent	Contractions	Fetal heart	Maternal Observations	Other
09:00	7 cms	3/5	3 in 10 minutes Lasting 55 seconds	125/minute	BP 120/80 P 85/min RR 18/min T 36.5°C	Clear Liquor since 06:00 Spontaneous onset of labour, previous caesarean for FTP
13:00	Fully dilated	3/5 Station -1	3 in 10 minutes Lasting 50 seconds	140/minute	Unchanged	Clear liquor
14:00	Fully dilated	2/5 station 0 (at spines)	3 in 10 minutes Lasting 50 seconds	150/minute	Unchanged	Clear liquor Moulding ++ Occipito-posterior
15:00	Fully dilated	2/5 Station +1	3 in 10 minutes Lasting 50 seconds	160/minute	Unchanged	Moulding +++ Occipito-posterior Clear liquor Pushing for 1 hour

Case 2 concerns the management of a patient who does not progress well in the second stage of labour. The case is further complicated because the patient's only previous delivery was by caesarean section for failure to progress in labour.

Initially progress is good, and the patient has reached 7 cms by the time of admission. Maternal observations and fetal heart rate are reassuring. The only slight concern is that the fetal head is not yet fully engaged, although this is not unusual in a multiparous patient.

Initially the patient makes good progress to full dilation within 4 hours. However, the head does not descend. Maternal and fetal observations remain reassuring.

After one hour the patient is re-examined and there has been some descent, but the fetal head remains at 2/5 palpable.

Note the rise in fetal heart rate. It is still within the reassuring range, but significantly higher than on admission.

Note also that 2+ of moulding has developed and the position is occipito-posterior, an adverse factor as a wider diameter of the fetal head will be presenting to the pelvis.

Discuss whether to allow the patient to push or not and if so for how long.

Note that after two hours in the second stage, the fetal head remains 2/5 palpable and the fetal heart rate has risen to 160/minute. Moulding has increased. It is time to deliver the patient. Discuss how to deliver, pointing out that as the fetal head remains 2/5 palpable in the maternal abdomen an assisted vaginal delivery cannot be attempted and the patient requires a caesarean. Ideally decision to delivery interval should be as near to 30 minutes as is possible, due to the presence of the uterine scar, fetal tachycardia and prolonged second stage.

Case 3

G1 P0, 40 weeks, Age 21

Table 2.1.3: Partograph – case study 3

Time	Dilation	Descent	Contractions	Fetal heart	Maternal Observations	Other
03:00	4 cms	2/5	3 in 10 minutes Lasting 40 seconds	130/minute	BP 112/70 P 85/min RR 17/min T 36.5°C	Intact membranes Spontaneous labour
07:00	5cms	2/5	2 in 10 minutes Lasting 30 seconds	135/minute	Unchanged	Intact membranes
11:00	6 cms	2/5	4 in 10 minutes Lasting 50 seconds	130/minute	BP 120/76 P 110/min RR 24/min T 37°C	Clear liquor

This case is a primigravid patient in early established labour with an engaged fetal head. She has almost reached the action line by 07:00. Discuss possible actions. Is this patient suitable for augmentation? Discuss conditions for safe augmentation. Explain that the membranes should be ruptured first. Ask about local protocols for augmentation with oxytocin. Discuss when to examine the patient again. Point out that 2 hours may be too soon to judge the effect of an oxytocin infusion and really it is best to wait until there have been at least two hours of good contractions.

After a further 4 hours the patient has only dilated 1 cm further. Explain that if the examination has been done by two different people it may not be accurate, whereas if the same member of staff performed both examinations the result is more likely to be reliable.

As there is no fetal distress would participants continue for longer or would they opt for a caesarean? What else should they consider?

Case 4

G1 P0, 40 weeks, 19 years

Table 2.1.4: Partograph – case study 4

Time	Dilation	Descent	Contractions	Fetal heart	Maternal Observations	Other
08:00	8 cms	1/5	4 in 10 minutes Lasting 50 seconds	162/minute	BP 115/70 P 105/min RR 22/min T 37.5°C	Liquor clear, membranes ruptured 20 hours ago Spontaneous labour
10:00	Fully dilated	1/5	4 in 10 minutes Lasting 50 seconds	170/minute	BP 115/78 P 115/min RR 26/min T 38°C	Meconium liquor ROA position

This case is about a primigravid patient with prolonged membrane rupture who is showing early signs of infection on admission. There is a borderline fetal tachycardia, raised maternal respiratory rate and a slight rise in temperature. However, the patient is well advanced in labour, with a deeply engaged head and with good uterine contractions. Discuss what should be done? Remember ABCD, antipyretics and antibiotics. Ask whether the patient should be delivered straight away or whether it would be OK to wait and see what happens.

After two hours the patient is fully dilated. The maternal condition has deteriorated with an increased pulse rate and respiratory rate, and a higher temperature. The fetal heart rate is more tachycardic and there is meconium. This patient needs to be delivered urgently but as the fetal head is low and occipito-anterior a vacuum delivery is indicated. Explain that the infection is not going to improve until the uterus is empty, despite the antibiotics. Delivery is indicated for both maternal and fetal reasons. Discuss liaison with the paediatricians who may want to treat the baby for possible infection.

Reference

WHO. (2018). Recommendations Intrapartum care for a positive birth experience. Geneva. World Health Organisation. Available at: http://apps.who.int/iris/bitstream/handle/10665/272447/WHO-RHR-18.12-eng.pdf?ua=1

Consent group discussion

2.2 Communication skills for informed consent | Role play

Equipment

- ☐ Whiteboard / flip chart + pens
- ☐ Laminated instructions for role playing participants

Key learning objectives

- To gain skill in obtaining informed consent for caesarean section

Instructions for the facilitator

Explain each case history to the participants then invite them to discuss the issues to be discussed with the patient when taking consent.

Guide the participants through the five points to be covered:

1. Reason for caesarean
2. How the procedure is performed
3. Benefits of the procedure
4. Risks with the procedure
5. Alternatives

Ensure all the points mentioned below are covered in the discussion.

Invite two of the participants to role play taking consent with each other. The remaining participants will observe.

Allow them 10 minutes.

Discuss the process. Ask how the participant role-playing the patient felt?

Did they feel that they were treated with respect?

Was the procedure well explained in a way they could understand?

What did their observers think?

If time allows, ask other participants to role play taking consent for a different case.

Case 1

A 28 year-old G2P1 with a history of a previous normal delivery has not progressed in her labour beyond 8cms dilated for the past 4 hours, despite strong contractions. The fetal head is 3/5 palpable in the maternal abdomen and the station is -2cms vaginally (or 2cms above the ischial spines). The fetal head is in a deflexed occipio-posterior position.

The membranes have already ruptured and the liquor is clear.

The action line has been reached on the partograph.

There is no evidence of fetal distress.

You decide the patient should be delivered by caesarean section for failure to progress. You think the probable cause of the failure to progress is a combination of the fetus being larger than her previous baby and the malposition (deflexed OP)

What are you going to tell the patient?

Hints for facilitators to mention:

Reason for caesarean

The labour has not progressed over the past four hours.

You have discovered from your examination that the baby is in a difficult position with its back to her back and its chin up. The baby's head will not fit through the pelvis easily in this position and it has become stuck. When she delivered previously it is likely that the baby was in a more favourable position and may have been smaller as second babies are often larger.

As the labour has not made any progress for four hours it is unlikely that waiting longer will result in improvement and further delay may result in fetal distress and increase the risk of bleeding and infection for the mother.

How the procedure will be performed

A spinal anaesthetic will be administered. This procedure will be explained by the anaesthetist in more detail but it will result in the loss of sensation from the upper abdomen down for the duration of the procedure.

Her bladder will be catheterised to keep it empty and minimise the risk of bladder damage and facilitate access to the lower part of the uterus (use words the patient will understand).

The operation will not start until you are sure that the anaesthetic is fully effective.

A horizontal cut about 12-15 cms long will be made across the lower abdomen 2-4 cms above the pubic bone.

The abdominal muscles are not usually cut as there is a natural midline division between the two rectus muscles.

The uterus will be opened horizontally and the baby and placenta delivered through this incision.

The benefits

Safe delivery for both mother and baby.

The risks

Immediate and short-term risks:

- Bleeding, infection, damage to adjacent structures, venous thrombo-embolism, trauma to baby. Consider quantifying these risks.

Longer term risks:

- Increased likelihood of future caesarean.

- Increased risk of pregnancy with abnormal placentation.

Alternatives

Wait longer. This is unlikely to result in avoiding the need for caesarean.

Ensure that the patient is given time to ask questions at every stage.

Ensure that they have clearly understood.

Case 2

A 26 year-old primigravid patient presents at 34 weeks with a 2 hour history of vaginal bleeding and constant abdominal pain. Prior to this she has not had any problems with the pregnancy. On examination the uterus feels hard and tender. The cervix is closed. The fetal heart is 90/minute.

You diagnose a placental abruption and decide an immediate caesarean is required

What are you going to tell the patient?

Reason

The signs suggest that the placenta is separating from the wall of the uterus too soon and the oxygen supply to the baby is being severely restricted. There is a need for immediate action to stabilise the mother and deliver the baby.

How the procedure will be performed

As above although with general anaesthetic.

Benefits

- Cessation of maternal bleeding
- Hope to save the baby

Risks

- Risks specific to abruption: extra risk of bleeding secondary to coagulopathy
- Atonic uterus
- Increased risk of hysterectomy
- Baby may not survive

Alternatives

Let the patient labour. If so baby very unlikely to survive and maternal condition may deteriorate.

Case 3

The patient is 30 years old and has had two previous deliveries, both by caesarean section. She is 37 weeks gestation. She has had episodes of bleeding at 27, 30 and 33 weeks. She has stayed in hospital since 30 weeks. Ultrasound has shown a placenta situated anterior and covering the cervix (anterior placenta praevia).

Reasons

The placenta is covering the cervix and the baby cannot be born naturally with the placenta in the way.

How the procedure is performed

In this case there is a risk of a placenta accreta of about 6%. It would be safer to perform a classical caesarean section to deliver the baby whilst avoid the placental location to reduce the risk of bleeding.

It is quite likely that a caesarean hysterectomy will be required if there is any further bleeding.

If there was no bleeding but the placenta failed to detach entirely there is the option of leaving the placenta in situ to be reabsorbed. Given that there have already been three episodes of antenatal bleeding this is unlikely.

This caesarean will be undertaken by an experienced surgeon who is capable of performing a hysterectomy should the need arise.

Benefits

- Safe delivery of the baby

Risks

- The main risk is of major haemorrhage. The patient is very likely to require a blood transfusion and there is a possibility of a hysterectomy. This would mean she would be unable to have any more children in the future and she would not have periods.
- If the uterus is conserved the patient should be offered a choice about tubal ligation due to risks of future pregnancy.

Alternatives

This patient must be delivered by caesarean, preferably under controlled circumstances prior to the onset of labour. Failure to do this will result in a much increased risk of major haemorrhage.

Module 3: Peri-operative Care

Peri-operative care breakout sessions

3.1 Anaesthetic assessment and preparation of the patient | Workshop

Equipment

- ☐ Whiteboard / flip chart + pens
- ☐ Laminate of WHO Pre-op Assessment and Anaesthetic Checklist (Figure 3.1.6)
- ☐ SpO2 probe
- ☐ BP cuff
- ☐ IV cannula
- ☐ Blankets / pillows for positioning

Key learning objectives

- To understand the importance of anaesthetic assessment and patient preparation
- To be able to complete a rapid anaesthetic assessment of the obstetric patient
- To use the anaesthetic assessment to anticipate problems and plan accordingly

Instructions for the facilitator

The facilitator leads the discussion, using a participant as a scribe. If time allows, organise a role play which focuses on taking a history and airway assessment.

Anaesthetic assessment

Facilitator: Why is anaesthetic assessment important? (2 min)

Expected answers:

- We need to anticipate problems and prepare appropriately
- To recognize problems and optimize the patient prior to anaesthesia
- Opportunity to communicate with the patient – explain what to expect, risks, benefits

Facilitator: What do you assess? (3 min)

Expected answers:

- Confirm patient identity
- Indication for and urgency of caesarean
- Past medical history
- Past surgical history/anaesthetic history – any problems
- Family history of problems with anaesthesia (e.g. suxamethonium apnoea/Malignant Hyperpyrexia)

- Obstetric history (e.g. pre-eclampsia/HELLP syndrome)
- Allergies
- Drug history
- Last meal
- Airway assessment
- Patient's current condition
- ASA Score

Airway assessment

Facilitator: Why is airway assessment important? (7 min)

Expected answers:

- Higher risk of aspiraton and failed intubation in obstetrics
- Failure to recognize difficult airway increases the risk of failed airway management
    - Mouth opening < 3 fingers / 5cm is higher risk

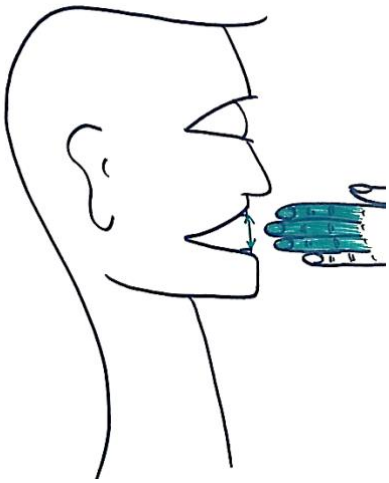
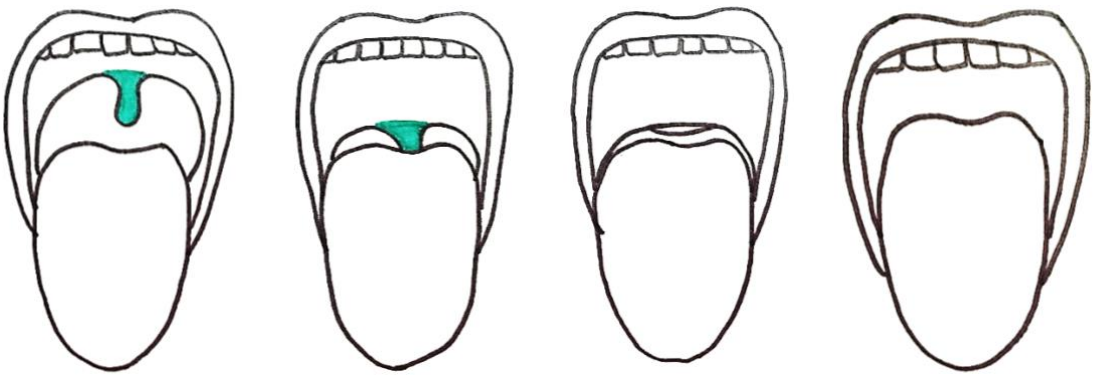


Figure 3.1.1: Checking mouth opening

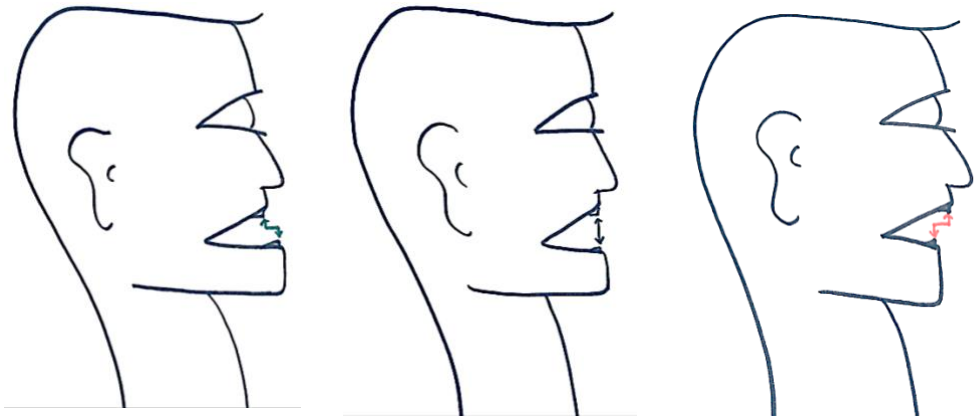
- Mallampati score of 3 or 4 is higher risk



Mallampati 1 Mallampati 2 Mallampati 3 Mallampati 4

Figure 3.1.2: Mallampati scores

- Jaw slide C is higher risk



Jaw slide A Jaw slide B Jaw slide C

Figure 3.1.3: Assessing jaw slide

- Neck movement < 90 degrees head tilt is higher risk)

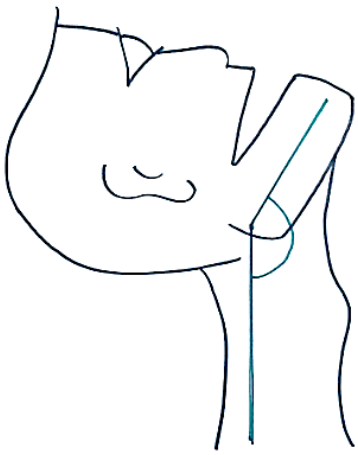


Figure 3.1.4: Measuring neck movement

- Thyromental distance – mouth closed, neck extended (< 7 cm => higher risk)

Figure 3.1.5: Measuring thyromental distance

Facilitator: How would you prepare for difficult airway management?

Expected answers:

- Assistant present
- Senior help (if available)
- Airway plans A, B, C, D
- Optimize positioning: Use volunteer and pillows/blankets to demonstrate ramping and keeping the ear above the sternum – especially important in obese patients.
- Optimize pre-oxygenation

Assessing the patient's current condition

Facilitator: How will you assess the patient? (2 min)

Expected answers:

- ABCDE approach
- Sick mothers (bleeding, pre-eclampsia, sepsis etc) – to be covered more in later talk
- Laboratory results (Haemoglobin, clotting, Platelets, Urea and Electrolytes) – Do not perform spinal if Platelets < 70 or INR > 1.4

ASA Score

(2 min)

Table 3.1.1: ASA score (Source: American Society of Anaesthesiologists)

Score	Definition
I	Healthy, non-smoking, minimal alcohol use
II	Mild systemic disease without limitation. E.g.: Smoker, pregnancy, obesity, well controlled Hypertension/Diaetes
III	Moderate-severe disease with functional limitation. E.g.: poorly controlled Diabetes/Hypertension/Chronic Obstructive Pulmonary Disease; morbid obesity (BMI> 40)
IV	Severe systemic disease that is a constant threat to life. E.g.: Myocardial Infarction/Cerebro-vascular accident in the past 3 months; cardiac ischaemia/severe valve dysfunction/severely reduced Ejection Fraction; sepsis/Disseminated Intravascular Coagulopathy
V	Moribund patient not expected to survive without the operation. E.g. ruptured aortic aneurysm; massive trauma; intracranial bleed with mass effect, multi-organ dysfunction
VI	Brain-dead organ donor

Choice of anaesthesia

(2 min)

- Spinal – indications and contraindications

- GA – indications and contraindications
- Communicating plan and risk with patient

Preparation of patient

(2min)

- Anaesthetic checklist of materials (See examples below)
- Antacid and prokinetic – ranitidine/sodium citrate; metoclopramide
- Intravenous access + fluid attached
- Monitoring on
- Wedge/tilt
- Positioning – tragus above sternum: demonstrate how the patient may be supported with blankets to improve positioning for intubation
- General Anaesthetic – Pre-oxygenation, assistant for cricoid
- Spinal – positioning; monitoring
- SIGN IN prior to induction
- Sick patients: stabilisation – to be covered in later session

Scenario

(As time allows, prioritise history and airway assessment)

30 year-old woman presenting for caesarean section at 38/40 due to pre-eclampsia and 2 previous caesarean sections

History

- Indication for and urgency of caesarean
    - Category 3
- Past medical history
    - Asthma – Well controlled
- Past surgical history/anaesthetic history – any problems
    - 2 previous caesareans – spinal, no problems
- Family history of problems with anaesthesia (e.g. suxamethonium apnoea/Malignant Hyper-pyrexia)
    - Nil
- Obstetric history
    - Pre-eclampsia in this pregnancy; 2 previous caesareans
- Allergies
    - No known drug allergies
- Drug history
    - Salbutamol inhaler 2x per month; Hydralazine + nifedipine since 30 weeks gestation
- Last meal
    - Last night
- Airway assessment
    - Perform on volunteer

Patient's current condition:

- Patent
- RR 16; SpO2 99%
- HR 80; BP 145/90
- No abnormalities detected
- Apyrexial; fetal HR normal; peripheral oedema
- Labs: Haemoglobin 11.5 g/dl; Platelets 200; Liver function normal; proteinuria 2+

Facilitator: What is this patient's ASA?

Expected answer: 3

Facilitator: What anaesthetic will you choose for this patient?

Expected answer: Spinal

Facilitator: Explain the risks of the anaesthetic

Expected answers:

- Failure – can give GA instead
- BP drop – associated nausea + vomiting – common and treatable
- Headache (< 1: 200 - 1:500) – not common, self-limiting/treatable
- Nerve damage – very rare and sometimes temporary, sometimes permanent (permanent < 1:45,500)
- Need for catheter
- Postoperative pain

Facilitator: Explain the benefits of the anaesthetic

Expected answers:

- Can stay awake to meet baby
- Better for baby – does not have General Anaesthetic
- Safer
- Better post-op analgesia

Facilitator: How will you prepare the patient

Expected answers:

- Anaesthetic checklist of materials (including intubation equipment even for spinal – See below)
- Antacid and prokinetic – ranitidine/sodium citrate; metoclopramide
- IV access + fluid attached
- Monitoring on
- Wedge / tilt
- Spinal – positioning; monitoring
- WHO safe surgical checklist SIGN IN prior to induction

Further discussions:

- Avoid pre-load with spinal in patients with pre-eclampsia; can give bolus of fluid/ephedrine if BP drops

- Avoid ergometrine in pre-eclampsia
- Avoid non-steroidal anti-inflammatory drugs (NSAIDs) in severe pre-eclampsia
- Avoid Carboprost in asthmatic patients

Summary

Pre-op assessment, including airway assessment can be performed rapidly

Make a safe anaesthetic plan based on your assessment

Communicate your plan to the patient, explain risks and benefits

Patient name _____ **Number** _____

Date of birth _____ **Procedure** _____

Site _____

Check patient risk factors *(if yes – circle and annotate)*		**Check resources**	Present and functioning
ASA 1 2 3 4 5 E		***Airway*** – Masks – Airways – Laryngoscopes (working) – Tubes – Bougies	☐ ☐ ☐ ☐ ☐
Airway *(Mallampati classification)*  Class 1 Class 2 Class 3 Class 4		***Breathing*** – Leaks (a fresh gas flow of 300 ml/min maintains a pressure of >30 cm H_2O) – Soda lime (colour, if present) – Circle system (two-bag test, if present)	☐ ☐ ☐
Aspiration risk?	No	***suCtion***	☐
Allergies	No	***Drugs and devices*** – Oxygen cylinder (full and off) – Vaporizers (full and seated) – Drips (intravenous secure) – Drugs (labelled, total intravenous anaesthesia connected) – Blood and fluids available – Monitors: alarms on – Humidifiers, warmers and thermometers	☐ ☐ ☐ ☐ ☐ ☐ ☐
Abnormal investigations?	No		
Medications?	No	***Emergency*** – Assistant – Adrenaline – Suxamethonium – Self-inflating bag Tilting table	☐ ☐ ☐ ☐ ☐
co-Morbidities?	No		

Figure 3.1.6: WHO pre-operative assessment and anaesthetic checklist (WHO)

Table 3.1.2: Sample anaesthetic checklist (Source: Ali Herbert)

Anaesthesia Safety Checklist		
M	ACHINE	02 + Reserve Vaporiser Ventilator Breathing circuit Ambu bag Operating table
S	UCTION	Yanker
M	ONITOR	BP SpO2
A	IRWAY	Mask Stylet/bougie ET tube Guedel Difficult intubation equipment
I	V	Access Fluid
D	RUGS	Induction drugs Muscle relaxant Antibiotics Uterotonics Analgesia Emergency drugs

Reference

WHO 2009 Guidelines for Safe Surgery. Geneva. World Health Organisation. Available at: http://apps.who.int/iris/bitstream/handle/10665/44185/9789241598552_eng.pdf;jsessionid=BABEBEB1F1AB02C29B49E71D446A599D?sequence=1

3.2 Basic airway skills | Skill

Equipment

- ☐ Airway head or Resus Anne Manikin
- ☐ Ambubag and mask
- ☐ Yankauer sucker
- ☐ Guedel (oropharyngeal airway) in various sizes
- ☐ Oxygen mask with a reservoir bag or a Hudson mask
- ☐ Magill forceps

Key learning objectives

- To learn which factors can contribute to obstructing an airway
- To demonstrate how to perform simple airway manoeuvres, to relieve an obstructed airway
- To demonstrate how to size and then insert a Guedel airway correctly
- To demonstrate how to use a bag valve mask effectively to give assisted ventilation to a patient (2-person technique)
- To demonstrate how to assess that a patient is not breathing using the look, listen and feel approach

Instructions for the facilitator

This is an interactive session, so all participants must have the opportunity to practice these basic airway skills following a demonstration by the facilitator.

Work through the workshop in the order it has been written.

Lay the equipment out on a table and get the students to stand around the table so that everyone can clearly see the facilitator demonstration.

Use the scenario to give the skill context

Facilitator: What causes an airway to become obstructed?

Expected answers:

- Foreign body
- Vomit, secretions, blood
- Tongue (due to reduced level of consciousness)
- Dentures
- Trauma to the airway (this can be penetrating or blunt)
- Tumour or Abscess
- Soft tissue swelling e.g. burn, anaphylaxis

Teaching the participants the basic airway skills

Scenario

You have been called to see a patient urgently on the labour ward. When you arrive you find the patient is having an eclamptic seizure, which is self-limiting and stops after 50 seconds. A loading dose of Magnesium Sulphate is administered. However, shortly after the seizure has terminated, you notice that the patient's airway sounds partially obstructed. How are you going to manage this obstructed airway?

How to perform these skills

1. Open the airway and look for a possible cause of the obstruction e.g. vomit, secretions, foreign object.
2. Explain to the participants that if a foreign object can be seen it should be removed with a pair of Magill forceps, or if vomit, blood or secretions can be seen then use a Yankauer sucker (**Remember:** only suction what you can see in the mouth, not deep into the throat).
3. Explain to the participants that the airway was suctioned but this did not help relieve the airway obstruction. Demonstrate to the participants how to perform a head tilt chin lift and a jaw thrust in order to help relieve the obstructed airway.
4. Make sure high flow oxygen (15 litres ideally or the maximum number of litres of oxygen deliverable in the facility) is given either via mask with a reservoir bag or a Hudson mask.
5. Explain to the participants that you have performed a jaw thrust, but this has only partially relieved the airway obstruction. Demonstrate how to size and then insert a Guedel airway correctly:
    a) Sizing: measure from the patient's incisor to the angle of their jaw:
        i) Too small: the Guedel will provide ineffective oropharynx patency.
        ii) Too big: the end of Guedel may become occluded and or cause trauma to the airway.
    b) Inserting: the airway is inserted into the mouth upside down initially, but once contact has been made with the back of the mouth (soft palate) the airway is rotated 180 degrees.
6. Remember to reapply the oxygen mask once the Guedel airway has been inserted.
7. Explain to the participants that a jaw thrust along with the insertion of a Guedel airway has helped relieve the airway obstruction, but you then notice that the patient's respiratory rate has dropped to 4 breaths per minute.
8. Demonstrate how to give assisted ventilation breaths using a bag valve mask attached to an oxygen supply. (**Remember:** a two-person technique must be used: one person must provide a good seal with the mask while providing a jaw thrust and the second person must squeeze the bag valve mask, keep the Guedel airway in.) Show the participant how to correctly apply the mask to the patients face.

9. Explain that this is not a secure airway, and the patient can still aspirate. The only way to definitively secure an airway is to intubate the patient and inflate the endotracheal tube cuff.
10. Demonstrate how to assess whether a patient is breathing or not
    a) **Lean** over the patient, then turn your head so that your cheek rests just above the patients mouth with your eyes facing in the direction of their feet
    b) **Look** to see if their chest is rising and falling
    c) **Listen** over their mouth and nose for breathing sounds
    d) **Feel** their breath against your cheek for 10 seconds
11. If the patient is not breathing, give assisted ventilation using a bag valve mask and call for help!
12. Also check whether the patient has a carotid pulse for 10 seconds, if there is no pulse start CPR.

3.3 Failed intubation | Scenario

Equipment

- ☐ Airway head manikin / Resus Annie manikin
- ☐ Intubation kit (Laryngoscope, Endo-tracheal tubes assortment of sizes, tie, lube)
- ☐ Bag valve mask
- ☐ Guedel airways (assortment of sizes)
- ☐ Bougie
- ☐ Laryngeal Mask Airway (assortment of sizes)
- ☐ Yankaeur sucker
- ☐ Size 10 blade with a handle
- ☐ Assortment of syringes sizes and drug labels
- ☐ Electrocardiograph dots, pulse oximeter, BP cuff, Stethoscope
- ☐ Cannula, I.V. fluids (Hartmann's, Ringer's lactate or Normal Saline 0.9%), giving set
- ☐ Catheter
- ☐ Patient gown and pillow/blanket to simulate a Gravid uterus
- ☐ Theatre drape
- ☐ 2 tables
- ☐ Laminated copy of the DAS obstetric general anaesthesia and failed tracheal algorithm
- ☐ Tablet with SimMon app: to use as a patient monitor
- ☐ White stickers for the participants: to write on the role they will be playing in the scenario
- ☐ Laminated copies of the scenario for the participants to read

Key learning objectives

- Multi-disciplinary team to work through the DAS obstetric general anaesthesia and failed tracheal algorithm together as a scenario
- For the other members of the multi-disciplinary team to understand what the potential implications a failed intubation has on the safety of a mother and the foetus
- To understand via a team discussion, the risk and benefits to both the mother and the foetus if:
- ***Option 1:*** The team decides to proceed with the caesarean section
- ***Option 2:*** The team decides to abandon the caesarean section and wake the patient up

Instructions for the facilitator

Prior to starting the scenario:

This scenario will be divided into 3 parts:

Allocating roles and setting the scene for the scenario

(3 minutes)

Running through the scenario (12 minutes)

Multi-disciplinary team discussion and feedback about the team's performance during the scenario (approx. 15 minutes)

How to set up the equipment for the scenario:

Use one table as an operating table, and a second table to place all the equipment on.

Set the scenario up so that the patient is already on the operating table. Use the manikin as the patient; put the gown on and place a pillow/blanket underneath the gown to simulate a Gravid uterus, and have the patient's abdomen cleaned, draped and ready for surgery.

Place the monitoring on (Electrocardiograph dots, pulse oximeter, BP cuff), cannulate and have the I.V. fluids attached and the patient already catheterised before starting the scenario.

Have the drugs and equipment for intubation already checked and prepared but remember to inform the anaesthetist and their skilled assistant this has been done prior to starting the scenario.

Set up the monitor using the tablet and SimMon app with the following observations (see below) before the participants arrive to begin the scenario.

Initial observations before anaesthetising the patient

HR	BP	O2 saturations	End Tidal (ET)CO2
92	110/75	98% on Air	None

Prior to commencing the scenario give all the participants a sticker with their designated job role on, so each member of the team can be clearly identified during the scenario. The participants should only be allocated the job role that they usually work in e.g. don't give a surgeon the role of the anaesthetist, the surgeon should play the surgeon.

Job roles

- Anaesthetist 1
- Anaesthetist 2
- Skilled anaesthetic assistant
- Surgeon 1
- Surgical assistant
- Scrub nurse 1 (in some situations they also function as the surgical assistant)
- Midwife
- Theatre nurse 1

You may have to be flexible with job role allocations, as some groups may have only one anaesthetist.

Explain to the participants before the start of the scenario that approximately 15 minutes will be allocated to the scenario, and a further 15 minutes will be for multi-disciplinary team discussion and feedback (emphasise to the participants that it will not be individual feedback).

Before starting the scenario ask the participants to stand in their usual positions, as if they were in the operating theatre about to start a caesarean section in their own hospital.

Encourage the participants to use the laminated copy of the DAS obstetric general anaesthesia and failed tracheal algorithm throughout the scenario.

Prior to starting the scenario explain to the participants that your role as the facilitator is to monitor the actions of the participants, and unless the participants work through the algorithm as if this was a real patient e.g. simulates trying to intubate and or oxygenate the patient using the equipment provided then the patient will continue to deteriorate.

Note Do not allow the patient to have a cardiac arrest during this scenario, as this will detract from the scenarios key learning objectives.

Read out the scenario, but also give the participants laminated copies of the scenario to read. Now the scenario should begin.

Scenario for the multi-disciplinary team

A 24-year-old woman, G3 P2 and 38+3 weeks gestation arrives in your hospital in labour. The patient has previously had two normal vaginal deliveries, however, a routine examination by the midwife on labour ward reveals the fetus is breech presentation. After discussion with the obstetrician and then the patient, the decision is made to deliver the fetus in theatre by caesarean section.

The patient has been consented for a spinal anaesthetic; however, the anaesthetist has failed to successfully perform one. The multi-disciplinary theatre team have been informed that the anaesthetist now needs to convert to a general anaesthetic. The anaesthetic pre-operative assessment of the patient prior to coming to theatre did not reveal any difficult airway concerns.

The patient has previously had an allergic reaction to ketamine; therefore a Rapid Sequence Induction (RSI) must be performed with Thiopental and Suxamethonium.

Now begin administering the general anaesthetic.

Instructions for the facilitator for the scenario: Depending on how the participants are managing the scenario, alter the observations on the monitor accordingly.

Managing the scenario well (works through the algorithm systematically)

HR	BP	O_2 saturations	$ETCO_2$
110	99/60	95% on 100% O_2	4.5

Managing the scenario poorly (intermittently uses the algorithm)

HR	BP	O_2 saturations	ETCO2
120	80/55	85 on 100% O_2	Not intubated

Managing the scenario very poorly (fails to use the algorithm)

HR	BP	O_2 saturations	$ETCO_2$
140	73/40	54 on 100% O_2	Not intubated

The anaesthetic outcome for the scenario

As the facilitator your role will be to guide the participants through what they can and can't see when they attempt to intubate the patient, and the outcome of that intubation attempt. As the facilitator you will also need to inform the 'anaesthetist' if they have been successful at oxygenating and ventilating the patient using a supraglottic airway (see table below for guidance on what the anaesthetic outcomes should be for this scenario).

Stage in the failed intubation algorithm	Anaesthetic outcome
1st attempt at intubation	Anaesthetist **fails** to intubate Grade 4 view
2nd attempt at intubation	Anaesthetist **fails** to intubate If the anaesthetist doesn't change anything it is still a Grade 4 view If the anaesthetist makes changes e.g. re-positioning the patient then the Grade 4 becomes a Grade 3 view but they still fail to intubate
3rd attempt at intubation	The second anaesthetist still **fails** to intubate the patient despite using e.g. a Bougie, applying BURP (Backwards Upwards Right Pressure), re-positioning the patient
1st attempt at insertion of an supraglottic airway	Anaesthetist **fails** to oxygenate and ventilate the patient
2nd attempt at insertion of an supraglottic airway	Anaesthetist **fails** to oxygenate and ventilate the patient
Facemask, Guedel and 4 handed technique	Anaesthetist is only **successful** at oxygenating and ventilating the patient with a facemask, Guedel and 4 handed technique

Prompts for the participants if they are struggling to work through the scenario

If the anaesthetist has more than 3 attempts at trying to intubate	Inform the delegates that the oxygen saturations are falling
If the anaesthetist is still trying to intubate the patient despite falling oxygen saturations	'Would you like to stop trying to intubate the patient, and call for senior help'
If the anaesthetist doesn't declare an emergency after failing to intubate	Ask the anaesthetist if they would like to declare an emergency
If they fail to call for help	'Would you like to call for help'
If the team is struggling to work through the scenario	Help guide them through the scenario using the laminated failed intubation algorithm

Instructions for the facilitator for the multi-disciplinary team discussion: Pause the scenario once the anaesthetist is able to successfully oxygenate the patient with bag valve mask, a Guedel airway and a 4-handed technique. Then facilitate the following group discussion.

Group discussion

Should the patient be woken up or should the team proceed with performing the caesarean section?

Give the team the DAS Table 1 laminate to help guide them through this difficult decision-making process.

Instructions for the facilitator for the multi-disciplinary team feedback: Ask the team what they think went well and what they would do differently next time.

As the facilitator feed back to the team what you think went well and any constructive suggestions of how the team could make improvements for the future.

Consider using the whiteboard / flip chart to write down the participants feedback.

3.4 WHO safe surgical check list | Workshop

Equipment

- ☐ Laminated WHO Checklist and example of WHO Checklist adapted to obstetrics
- ☐ WHO checklist for participating hospital, if available
- ☐ Whiteboard / Flip chart + pen
- ☐ Anaesthetic Checklist
- ☐ Anaesthetic face mask
- ☐ Syringes – induction agent, suxamethonium, antibiotic, ephedrine, blank 5ml syringe for spinal
- ☐ Cannula + IV fluid
- ☐ Drapes
- ☐ Swabs and instruments for counting
- ☐ Count sheet
- ☐ Wedge
- ☐ Neonatal Ambu bag
- ☐ Baby

Key learning objectives

- To understand how the WHO Checklist may be adapted to obstetric practice
- To address barriers to using the WHO Checklist in emergency situations

Instructions for the facilitator

This session is broken into three sections:

1. Exploring current practice
2. Adapting the Checklist
3. Role plays (as time allows)

1. Explore current practice:

- Do you use the WHO Checklist for caesarean section?
- If not, why not?
- Have you had any problems with its use?
- Who reads the Checklist?
- Do you recall any cases that didn't go so well in your hospital (you can give examples of your own)?
- How might the WHO Checklist have prevented these?
- Do you know the percentage mortality from surgery in your hospital?
- Do you know the percentage of complications following caesarean in your hospital?

Explore barriers to WHO Checklist use and encourage participants to consider possible solutions.

2. Adapting the Checklist

You may wish to ask one of the participants to write the key points from the discussion on a white board or flip chart.

It is important that any adaptations are made with the agreement of the whole team, and that they are trialled in a simulation to ensure that the Checklist works well, and is concise.

Facilitated discussion of possible adaptations for Obstetrics

Facilitator: What adaptations have been made to the WHO Checklist for caesarean section in your hospital (if any)?

Examples:

- Ensuring midwife is present for the Checklist
- Combining Team Brief and Sign-In (as in video example)
- Combining Sign-In and Time-Out
- Discussion of oxytocic agent
- Has the neonatal resuscitation equipment been checked?
- Sign-Out: VTE prophylaxis

3. Role play

Allocate roles that people would normally play in theatre (i.e. a midwife plays a midwife and is not expected to be an anaesthetist).

- Anaesthetist
- Scrub nurse
- Obstetrician/surgeon
- Midwife
- Nurse/Aide (runner)
- Patient
- Birthing partner
- Observer (ask them to time the parts of the checklist)

Choose a scenario from the following list and ask the team to role play the Checklist for that case.

Examples:

- Category 1 caesarean for cord prolapse in a mother with penicillin allergy
- Category 3 caesarean for 30/40 twins in a mother with pre-eclampsia (need 2 midwives and 2 sets of neonatal resus equipment)
- Category 1 caesarean for placenta praevia with bleeding

If time allows, ask the anaesthetist to run through their checklist and the scrub nurse and assistant to complete the initial swab and instrument count.

- Allow the scenario to run, ensure that the checklist is read out loud by whoever would normally read it in their hospital (the runner is ideally positioned).

- Feedback – encourage feedback from the participants and the observers:
    - What went well?
    - What was difficult?
    - What would you do differently next time?
    - How long did the checklist take?

Summary

- The WHO Checklist can be performed rapidly and safely in emergency situations.
- The Checklist can be adapted to Obstetrics.
- Anaesthetic and swab / instrument checks must be performed before the WHO Checklist.
- All team members play a role in using the Checklist effectively.
- The Checklist SAVES LIVES!

Postoperative care breakout sessions

3.5 Modified early obstetric warning score 1-4 | Workshop

Equipment

- ☐ Laminated early warning scoring charts
- ☐ Pens for laminates

Key learning objectives

- To become familiar with using an early warning scoring chart
- To appreciate that acting on to early warnings leads to better outcomes

Instructions for the facilitator

As you go through each case, discuss what should be done following each set of observations and consider with participants what would have been the likely outcome had the correct action been taken. It is very important to emphasise that when the score is 2 observations should be repeated in 30 minutes and not left for longer. A score of 3 or more means a full medical review should be undertaken but the midwife should also take what action she can to improve the situation.

For each case, emphasise that is earlier action had been taken the patient would not have become so dangerously ill, action would have been more straightforward and the outcome would have been better. Emphasise that acting earlier means less work for the doctors and midwives too!

Participants should fill in the laminated charts and work out the scores for each case. The facilitator will need to read out the observations one by one, ensuring each participant enters them on the chart and calculates the score for each observation, and the total score. Make sure they also enter times on the chart and sign that they are the person doing the observations.

Discuss each score together and ensure that everyone agrees. Discuss the possible causes of the score and the actions that should be taken following each score.

Case 1: Post-caesarean

A patient comes out of theatre at 13:30 having had an emergency caesarean section for prolonged obstructed labour

Her first set of observations in the recovery room at 14:00:

BP	120/70
Pulse	85/min
Respiratory rate	14/min
Conscious level	V
Temp	37

Facilitator	Expected answer
What is the EWS score?	EWS score is 1
Are these results reassuring?	Yes
Are you worried?	No
What should be done next?	Repeat obs. in 30 mins as post op

At 14:30 the next set of observations are done

BP	120/60
Pulse	115/min
Respiratory rate	26/min
Conscious level	V
Temp	37

Facilitator	Expected answer
What is the EWS score?	EWS score is 5
Are these results reassuring?	No
What has changed?	Pulse and RR
What is the likely cause for the change?	Blood loss
What should be done next?	Assess for cause of loss concealed or revealed and treat. Discuss treatment.

At 15:00 the next set of observations are done

BP	105/60
Pulse	130/min
Respiratory rate	28/min
Conscious level	V
Temp	37

Facilitator	Expected answer
What is the EWS score?	EWS score is 6
Are these results reassuring?	No
What has changed?	Higher pulse and RR, slight fall in BP
What is the likely cause for the change?	More blood loss

Nothing is done

Next set of observations at 15:30

BP	75/40
Pulse	140/min
Respiratory rate	33/min
Conscious level	P
Temp	36.5

Facilitator	**Expected answer**
What is the EWS score now?	EWS score is 10
What is the likely reason for this?	Heavy blood loss
What added complications may be present	Coagulopathy
What needs to be done?	ABCD, Back to theatre
What will happen if no action taken?	Death within an hour

Case 2: Post-caesarean

A primigravid patient is admitted at 36 weeks gestation with a history of feeling unwell for 3 days. There is a watery purulent discharge vaginally and a fetal tachycardia of 170/minute. She is experiencing regular contractions. The cervix is 4 cms dilated. After one hour the fetal heart is 180/minute and a caesarean section is performed. She is taken to the recovery room at 11:30.

Facilitator: What are the risk factors from the history?

Expected answer: Early onset sepsis from prolonged pre-labour membrane rupture.

Her first set of post-operative observations at 12:00

BP	110/60
Pulse	110/min
Respiratory rate	26/min
Conscious level	V
Temp	38

Facilitator	**Expected answer**
What is the EWS score?	EWS score is 5
Are these results reassuring?	No
What should happen next?	ABCD and assess patient, give antibiotics

Nothing is done and no further observations are made for 2 hours

At 14:00 her next set of observations are

BP	110/60
Pulse	125/minute
Respiratory rate	32
Conscious level	P
Temp	39

Facilitator	**Expected answer**
What is the EWS score?	EWS score is 9
Are these results reassuring?	No
What has changed?	> Pulse, resp. rate and temp
What might be the problem?	Infection from prolonged rupture of the membranes
What should happen next?	ABCD, broad spectrum antibiotics, iv fluids, antipyretics

Nothing is done

At 16:00 the next set of observations are

BP	80/50
Pulse	135/minute
Respiratory rate	40/minute
Conscious level	U
Temp	39

Facilitator	**Expected answer**
What is the EWS score?	EWS score is 13
What has changed?	> Pulse, < conscious level, < BP
What might be the problem?	Septic shock
What should happen next?	ABCD, broad spectrum Antibiotics, rapid IV fluids
What will happen if no action is taken?	Death soon

Case 3: Antenatal

A patient is admitted at 39 weeks in her first pregnancy complaining of a headache, blurred vision and nausea and contracting strongly 4/10 minutes. The cervix is 5 cms dilated She is in active labour. Four hours later she continues to contract strongly but her cervix remains 5 cms dilated and a caesarean is arranged and performed.

Her first set of post-operative observations on the postnatal ward are

BP	165/98
Pulse	90/min
Respiratory rate	16/min
Conscious level	Alert
Temp	37

Facilitator	**Expected answer**
What is the EWS score?	EWS score is 2
Are you worried?	Yes, high BP
What should happen next?	Assess patient for Pre-eclampsia and make plan

She is left for 12 hours

Her next set of observations are

BP	170/120
Pulse	100/min
Respiratory rate	20/minute
Conscious level	Irritated
Temperature	37

Facilitator	**Expected answer**
What is the EWS score?	EWS score is 4
What has changed?	BP higher, conscious level changed
Are you worried?	Yes
What should happen next?	Assess and treat Pre-eclampsia

One hour later the relatives observe that patient has had a fit

Her observations are

BP	205/125
Pulse	100/min
Respiratory rate	25/minute
Conscious level	U
Temp	37

Facilitator	**Expected answer**
What is the EWS score now?	EWS score is 8
Are you worried?	Yes
What should happen next?	ABCD, Mg SO4, antihypertensives,
What will happen if no action is taken?	Risk of CVA, cerebral oedema, airway obstruction

Case 4: Post-assisted vaginal delivery

A patient had an assisted vaginal delivery following a prolonged second stage one hour ago. She had an episiotomy plus a vaginal tear that were sutured. At 1 am She calls the midwife because she is experiencing severe pain. The midwife does a set of observations

BP	110/60
Pulse	110/minute
Respiratory rate	25/minute
Conscious level	Alert
Temperature	37

Facilitator	**Expected answer**
What is the EWS score?	EWS score is 2
Are you worried?	Yes
What should happen next?	Repeat observations in 30 minutes

The midwife gave the patient paracetamol but does not return to repeat the observations in 30 minutes. The patient complains of severe and worsening pain to her relatives. At 3 am the midwife attends to the patient.

BP	90/50
Pulse	120/minute
Respiratory rate	30/minute
Conscious level	Alert
Temperature	37

Facilitator	**Expected answer**
What is the score now?	EWS score is 5
Are you worried?	Yes
What should happen next?	ABCD, urgent medical review
What might be the cause?	Bleeding (concealed)

The midwife calls the doctor but they are busy and arrive at 4:30 am.

Observations at that time:

BP	75/45
Pulse	140/minute
Respiratory rate	35/minute
Conscious level	P
Temperature	37

Facilitator	Expected answer
What is the score now?	10
Are you worried?	Yes, very worried
What should happen next?	ABCD and resuscitate the patient, secondary survey
What is the likely cause?	Bleeding

The doctor examines the patient and discovers she has a large vaginal haematoma. She will have to go to theatre and has additional risks of anaesthesia when she is in shock. She is also at risk of DIC and she will certainly require a blood transfusion.

Modified Early Obstetric Warning Score (MEOWS)

Ward/Specialty ……

Name …… Age ……

Brief Medical History ……

If score 0 or 1, repeat obs 12 hourly
If score 2, repeat in 30 minutes
If score 3 or more, call DR/CO

Date	Time	RR	Score	Pulse	Score	Syst BP	Score	Dias BP	Score	Temp	Score	Cons Level	Score	Urine	Score	Total Score	Sign

Score	3	2	1	0	1	2	3
RR		<8		8-18	19-25	26-30	>30
Pulse		<40	40-50	51-100	101-110	111-129	>129
Syst BP	<70	71-80	81-100	101-159	160-200	>200	
Dias BP				<95	95-104	≥105	

Score	3	2	1	0	1	2	3
Temp	<34	34-34.9	35-35.9	36-37.7	37.8-38.5	>38.5	
Conscious Level	Un-res-ponsive	Respond to pain	Respond to voice	Alert	Irritated		
Urine (ml.hr)	0	<20	<30	≥30			

Figure 3.5.1: MEOWS chart

Safe blood transfusion group work

3.6 Complications of blood transfusion | Scenario

Equipment

- ☐ Mannequin (if available), otherwise use a participant as the patient
- ☐ Whiteboard / Flip chart + pens
- ☐ Theatre table/bed/couch
- ☐ BP cuff
- ☐ Pulse oximeter
- ☐ IV fluids + given set
- ☐ Cannulae x 2
- ☐ Unit of blood laminate
- ☐ Paperwork for the unit of blood
- ☐ Patient wristband (with patients full name, date of birth and hospital number written on it)
- ☐ Oxygen mask
- ☐ Laryngoscope
- ☐ Yankaeur suction
- ☐ IPAD + SimMon (if available)

Key learning objectives

- Identifies early that the patient has developed an acute blood transfusion reaction after receiving blood
- Administers appropriate treatment specific to an acute blood transfusion reaction, as well as understanding the importance of notifying the hospital transfusion laboratory immediately
- Demonstrates an ABCDE approach to the management of a critically unwell patient

Scenario

A 24 year old female is currently receiving a second unit of blood (packed red cells) on the post natal ward following an emergency caesarean section, which led to an estimated blood loss of 2.7 litres.

The midwife goes to see the patient to perform some routine observations, and notices that she is very pale and clammy with a HR 125bpm, BP 80/40 and a temperature of 39.2C. She is obviously anxious and is complaining of difficulty breathing and pain in her chest. The midwife admittedly calls for help.

Instructions for the facilitator

This workshop should be run as a low fidelity simulation, using a Mannequin or participant as the patient

Ask the participants to repeat back the scenario to ensure they have all understood the information given to them before starting the simulation

Give the participants the following roles: midwife/nurse (more than one participant can be given this role), anaesthetist and surgeon

If the participants fail to correctly manage the patient using the ABCDE approach or give the incorrect treatment, then let the patient continue to deteriorate until the right treatment is given

Prior to completing the workshop ensure all participants understand the signs and symptoms of an acute haemolytic blood transfusion reaction blood, and the specific management for this particular medical emergency. Consider using the whiteboard to summarise the key learning points

Work through the simulation in the order it has been written

Facilitator: What do you think is the problem with this patient?

Expected answer: Acute haemolytic blood transfusion reaction (If the participants don't know correct answer, don't give it to them yet)

Instructions for the facilitator

Encourage the participants to list some potential differential diagnoses

Facilitator: How should this potentially life threatening medical emergency be managed?

Expected answer: ABCDE

Instructions for the facilitator

Ask the participants to simulate performing the ABCDE approach on the patient, and give the following signs, symptoms and observations when asked by the participants (see table at the top of the next page).

Facilitator: What do you think is the problem with this patient now that you have examined them using the ABCDE approach?

Expected answer: Acute haemolytic blood transfusion reaction

Instructions for the facilitator

If the participants still don't know the diagnosis and therefore haven't started to treat for a suspected blood transfusion reaction, tell the participants the correct diagnosis and help them work through the specific treatment for an acute haemolytic blood transfusion reaction

Airway	Patent
Breathing	RR 30 Patient complains of difficulty breathing + pain in their chest Good air entry on auscultation Oxygen saturations 93% on Room Air
Circulation	HR 130 bpm regular BP 80/40 Clammy
Disability	Very anxious - patient states 'I can't breath' GCS 15/15 Temp 39.2 BM 6 mmol/L
Exposure	No obvious rash

Depending on how the participants are managing the scenario, alter the observations on the monitor accordingly.

Managing the scenario well:

HR	**BP**	**O_2 saturations**	**Temp**
130	80/40	93% on Room Air	39.2

Managing the scenario poorly:

HR	**BP**	**O_2 saturations**	**Temp**
140	75/35	85% on Room Air	39.2

Managing the scenario very poorly:

HR	**BP**	**O_2 saturations**	**Temp**
150	60/30	80% on Room Air	39.2

Facilitator: What specific steps need to be taken to safely manage an acute blood transfusion reaction?

Instructions for the facilitator

The management of a blood transfusion reaction will depend on whether the reaction is mild, moderate, or severe/life threatening. However the initial steps should be the same regardless of the severity of the reaction.

Don't just give the participants the correct answer; help the team to work through solving the problem together.

Give prompts if needed. Remember this is a simulation so participants must simulate giving the treatment to the patient rather than just verbally giving the answers.

The participants will have just had a lecture on blood transfusion, in addition to the answers being in the participant manual so this scenario shouldn't be completely new to them.

Management of an acute blood transfusion reaction

- STOP the blood transfusion immediately and change the giving set. Don't discard the unit of blood, this must be sent back to the laboratory so that can investigate what went wrong
- Maintain IV access with Normal Saline or Ringer's Lactate
- Monitor the patient e.g. pulse, respirations, BP, oxygen saturations, temperature and urinary output
- Ensure the airway is patent, and consider high flow oxygen or even intubation
- Re-assess the patient following every treatment that is given to ensure the patient is improving rather than deteriorating further
- Check identification details between the patient/their wristband, the unit of blood itself and the paperwork that comes with it
- Visually inspect the unit of blood looking for evidence of clumps, discolouration and the expiry date (this should have been done prior to starting the blood transfusion, but check again)
- Inform the Hospital Transfusion Laboratory immediately, and return the blood component and any other units of blood issued to the laboratory urgently. Remember another patient in the hospital may also have received the wrong blood.

Facilitator: Where should this patient be moved to?

Expected answer: Intensive Care Unit / High dependency unit (if the participants hospital has one) or recovery for close monitoring

Instructions for the facilitator

Pause the scenario 5 minutes before the end of the workshop, and summarise the signs and symptoms of an acute haemolytic blood transfusion reaction blood

Facilitator: What is an acute haemolytic reaction?

Expected answer: ABO incompatibility is the most severe blood transfusion reaction there is.

For example, if group B blood is given to a group O patient, only a few mls of the wrong blood will trigger a massive immune response leading to shock and DIC (disseminated intravascular coagulation). Individuals may die from circulatory collapse, severe bleeding or renal failure, often within minutes or hours of receiving the incorrect blood.

Patients can present with the following signs and symptoms

- Fever, chills, chest pain, flank pain
- Buring sensation at the site of the blood transfusion
- Dyspnoea, anxiety
- Tachycardia, hypotension
- Haemoglobinuria

Instructions for the facilitator

Take home message for the participants. This is a medical emergency and the patient is likely to die if an acute haemolytic blood transfusion is not identified early and supportive treatment given immediately.

Module 4: Management of the Second Stage of Labour

Assisted vaginal delivery breakout sessions 1

4.1 Classification of, indications and contraindications for Assisted Vaginal Delivery (AVD) | Workshop

Equipment

- ☐ Whiteboard / flip chart + pens
- ☐ Various types of vacuum delivery equipment (Kiwi, Procup, Malmstrom etc.) or pictures

Key learning objectives

- Discuss the indications for AVD
- Discuss the classification of AVD
- Describe the contraindications for AVD

Instructions for the facilitator

This is a closed session, led by the faculty who ensure active participation by trainees.

Discuss key terms: Assisted vaginal delivery, operative vaginal delivery or instrumental vaginal delivery refers to assisted vaginal deliveries with obstetric forceps and vacuum. The breakout sessions will focus on assisted vacuum vaginal delivery.

Facilitator: What is the incidence of vacuum vaginal delivery in your country and hospital?

Less than 5% of deliveries in sub Saharan Africa are by instrumental vaginal delivery, the rates in the UK are 10-15% and about 4.5% in the USA. There is evidence of a decreasing trend in AVD worldwide whilst caesarean sections are on the increase (Ameh and Adaji 2011, Ameh and Weeks, 2009).

Facilitator: What types of equipment for assisted vaginal delivery do you have in your hospital?

Facilitator: What are the indications for assisted vaginal delivery?

Expected answers:

Fetal

- Presumed fetal compromise

Maternal

- To shorten and reduce the effects of the second stage of labour on medical conditions (e.g. cardiac disease Class III or IV*, Marfan's disease with a dilated aortic root, hypertensive crises, myasthenia gravis, spinal cord injury patients at risk of autonomic dysreflexia).

Inadequate progress

- Nulliparous women – lack of continuing progress for 3 hours (total of active and passive second-stage labour) with regional anaesthesia, or 2 hours without regional anaesthesia
- Multiparous women – lack of continuing progress for 2 hours (total of active and passive second-stage labour) with regional anaesthesia, or 1 hour without regional anaesthesia
- Maternal fatigue/exhaustion

Indications for assisted vaginal delivery (RCOG 2020)

Facilitator: How are assisted vaginal deliveries classified?

Emphasize the need for a standard classification system

- Bench marking
- Audit and comparison between studies

Expect the participants to discuss the following information, this defines the delivery by station and position. Check that the group understand what station and position is and use this consistently in their practice.

Outlet

- Fetal scalp visible without separating the labia.
- Fetal skull has reached the pelvic floor.
- Rotation does not exceed 45º.
- Fetal head is at or on the perineum.

Low

- Fetal skull is at station +2 but not on the perineum.
- Two subdivisions:
    - Non rotational of ≤45°.
    - Rotational >45°.

Mid

- The fetal head is no more than 1/5th palpable per abdomen.
- The leading point of the skull is at station 0 or +1.
- Two subdivisions:
    - Non rotational of ≤45°.
    - Rotational >45°.

High

- Not included in the classification, as operative vaginal delivery is not recommended in this situation where the head is 2/5ths or more palpable abdominally and the presenting part is above the level of the ischial spines

Classification for assisted vaginal delivery (RCOG 2020)

Facilitator: What measures can be taken to prevent an assisted vaginal delivery?

Expect a discussion around:

- All women should be encouraged to have continuous support during labour
- Use of upright or lateral positions and avoiding analgesia can reduce the need for operative vaginal delivery
- Delayed pushing in primiparous women with an epidural can reduce the need for rotational and mid-cavity delivery

(RCOG 2020)

Facilitator: What are the contraindications to performing assisted vacuum delivery?

Expect a discussion around the following:

- AVD with vacuum should be avoided at gestations less than 32 weeks + 0 days.
- AVD with vacuum should be used with caution at gestations between 34 weeks + 0 days and 36 weeks + 0 days.
- Macerated fetus
- When the indications and pre-requisites are not confirmed.

Facilitator: What is trial of assisted delivery and where should it be conducted?

Expect a discussion around:

- Trial of assisted delivery is indicated for assisted vaginal births with a higher risk of failure and should be conducted in a place where caesarean section can be immediately conducted if the trial is unsuccessful.
- A higher rate of failure is associated with
    - Maternal body mass index over 35
    - Estimated fetal weight over 4000g or clinically big baby
    - Occipito-posterior position
    - Mid-cavity delivery or when 1/5th of the head palpable per abdomen. This is because the biparietal diameter is still above the level of the ischial spines.
- Fetal birth asphyxia has been associated with delay between failed AVD and a caesarean section.

4.2 Assisted vaginal delivery: Pre-requisites and equipment | Workshop

Equipment

- ☐ Whiteboard / flip chart + pens

Key learning objectives

- Discuss the pre-requisites for operative vaginal delivery
- Discuss consent for operative vaginal delivery
- Describe the different equipment for assisted vaginal delivery
- Discuss care of the equipment for assisted vaginal delivery

Instructions for the facilitator

This is a closed session, led by the faculty who ensures active participation by trainees.

Facilitator: What are the pre-requisites for operative vaginal delivery?

Expect a discussion around the following information:

Full abdominal and vaginal examination (accurate assessment of descent may require bi-manual palpation

- Head is ≤1/5th palpable per abdomen
- Vertex presentation
- Cervix is fully dilated, and the membranes ruptured
- Exact position of the head can be determined so proper placement of the instrument can be achieved.
- Assessment of caput and moulding
- Pelvis is deemed adequate. Irreducible moulding may indicate cephalo–pelvic disproportion.

Preparation of mother

- Clear explanation should be given, and informed consent obtained.
- Appropriate analgesia is in place for mid-cavity rotational deliveries. This will usually be a regional block.
- A pudendal block may be appropriate, particularly in the context of urgent delivery.
- Maternal bladder has been emptied recently. In-dwelling catheter should be removed, or balloon deflated.
- Aseptic technique

Preparation of staff

- Operator must have the knowledge, experience and skill necessary.
- Adequate facilities are available (appropriate equipment, bed, lighting).
- Back-up plan in place in case of failure to deliver. When conducting mid-cavity deliveries, theatre staff should be immediately available to allow a caesarean section to be performed without delay (less than 30 minutes).
- A senior obstetrician competent in performing mid-cavity deliveries should be present if a junior trainee is performing the delivery.
- Anticipation of complications that may arise (e.g. shoulder dystocia, postpartum haemorrhage)
- Personnel present that are trained in neonatal resuscitation

Facilitator: What type of consent is required for AVD?

Expect a discussion around the following points

- Women should be communicated in clear and simple language about the progress of their labour, their condition and that of their baby and the options for delivery.
- For deliveries in the delivery room, if possible a written consent is obtained but at least verbal consent should be obtained. This should subsequently be documented in the delivery notes.
- For a trial of operative vaginal delivery in theatre, written consent is required.

In some health systems, specific written information for women is provided (RCOG 2012).

Facilitator: What equipment do you have or know are used for assisted vaginal delivery?

Facilitator: What are the basic parts of a standard vacuum delivery equipment?

Expect the following to be discussed:

The standard vacuum delivery equipment has the following parts

- **Cup:** These are hard/rigid (metal or hard plastic) or soft cups (silicon or soft plastic). The cup attaches at the *flexion point* on the fetal scalp. The soft cups are associated with fewer cosmetic marks on the fetal scalp. The chignon (artificial caput succedaneum) formed in the cup on the fetal scalp when the vacuum is induced is the mechanism for attachment. The chignon rapidly decreases in size within an hour, to become a diffuse swelling like the normal caput, disappearing over a day or two. The hard/rigid cups form a better chignon than soft cups. The soft cups are less effective than the rigid cups in achieving vaginal delivery and are more prone to pop offs.
- **Stem:** Flexible or Rigid. The flexible stem makes the cup easily manoeuvrable, so it can be placed easily in occipito-transverse and posterior positions without distortion of the anatomy of the vagina. For occipito-posterior deliveries with a rigid stem, use a posterior cup with the stem attachment to the edge of the cup. A centrally inserted rigid stem would prevent correct application over the flexion point in the occipito-posterior position.

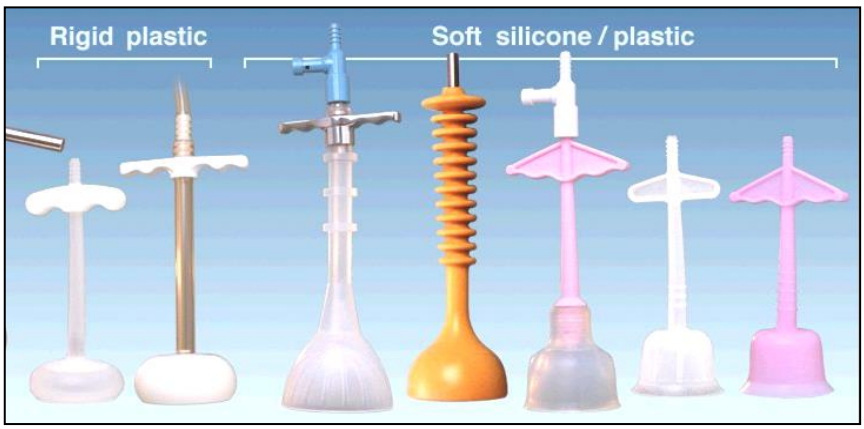


Figure 4.2.1: Various types of soft and rigid plastic cups, all with fixed right angles stems

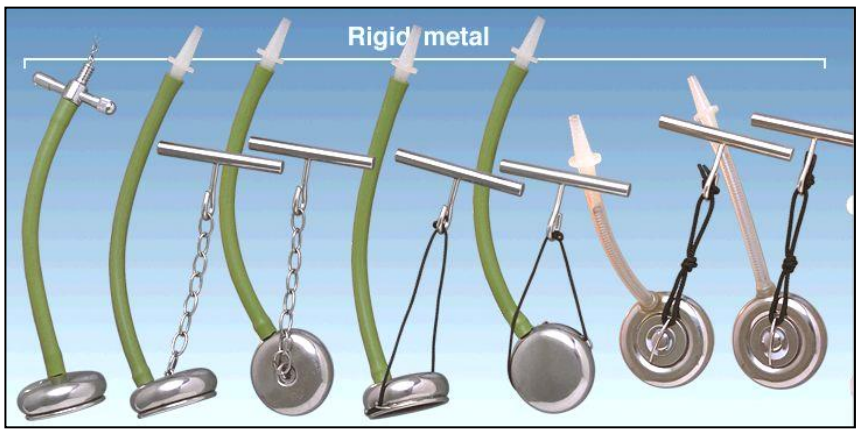


Figure 4.2.2: Metal cups with rigid stems, including Malmstrom and Bird modification

- **Vacuum pump systems:** Pumps can be manual (hand or foot) or electric. Depending on the design of the equipment, one or two operators may be required to operate it. The vacuum delivery equipment has a gauge, this guides the operator to achieve the maximum pressure require for a successful delivery (600mmHg/0.8bar/80kPa). This is equivalent to the border between the green and the red zone on the Kiwi Omni cup gauge (Vacca, 2003).

The clinician should choose the instrument most appropriate to the clinical circumstances and their level of skill.

Vacuum and forceps delivery are associated with different benefits and risks. Failed delivery is more likely with vacuum compared to forceps (See below).

The options for rotational deliveries include:

- Manual or digital rotation
- Direct traction or rotational forceps
- Rotational vacuum extraction

Vacuum extraction compared with forceps is:

- more likely to fail delivery with the selected instrument (OR 1.7; 95% CI 1.3–2.2)
- more likely to be associated with cephalhaematoma (OR 2.4; 95% CI 1.7–3.4)
- more likely to be associated with retinal haemorrhage (OR 2.0; 95% CI 1.3–3.0)
- more likely to be associated with maternal worries about baby (OR 2.2; 95% CI 1.2–3.9)
- less likely to be associated with significant maternal perineal and vaginal trauma (OR 0.4; 95% CI 0.3–0.5)
- no more likely to be associated with delivery by caesarean section (OR 0.6; 95% CI 0.3–1.0)
- no more likely to be associated with low 5-minute Apgar scores (OR 1.7; 95% CI 1.0–2.8)
- no more likely to be associated with the need for phototherapy (OR 1.1; 95% CI 0.7–1.8).

(Johanson and Menon 1999)

Facilitator: How do we maintain the equipment?

Expect the discussion to include:

- Disposable versus reusable equipment
- Practices in units performing AVD

4.3 Assisted vaginal delivery: position and station determination I Skills

Equipment

- ☐ Whiteboard / flip chart + pens
- ☐ Lucy and mum model X 2
- ☐ Water based gel
- ☐ Talc powder

Key learning objectives

- Correctly define the position in a cephalic presentation
- Correctly define the station in a cephalic presentation

Instructions for the facilitator

This is a closed session, led by the facilitator who ensures active participation by trainees. Use the flip chart to make diagrams for discussion.

Facilitator: Find out if position and station are routinely documented in practice?

It is very important to routinely determine the position and station of the presenting part and document this:

- to determine progress of labour
- to appreciate the mechanism of labour
- to ensure pre-requisites for conducting AVD are present

Facilitator: Discuss the terminologies used for positions: Left, right, anterior, posterior, lateral/transverse. Left/right is maternal left/right rather than operator's left or right.

90% of cephalic presentations are occipito anterior, 10% are occipito transverse or posterior and 50% of these will rotate to OA position.

Position: DOA, LOA, ROA, ROT, LOT, DOA, ROP, LOP

The position of the baby in relation to the presenting part of the mother's pelvis. It is expressed to the denominator which may be:

- Occiput in vertex
- Sacrum in breech presentation
- Mentum (chin) in face presentation

The station is the descent of the denominator relative to the maternal ischial spines. It is the distance in centimeters from the leading boney point of the presenting part to above or below the ischial spines. The decent may be determined via abdominal palpation Crichton's rule of Fifths). This may be difficult in the presence of excessive abdominal fat or tense abdominal muscles due to maternal pain. Decent can be determined vaginally as well but severe caput may make this difficult in practice. **Bimanual palpation is useful to determine descent accurately.**

Station: -5, -4, -3, -2, -1, 0, +1, +2, +3, +4, +5 cms above or below the ischial spines (Figure 4.3.1)

Mid cavity (0 to +1), low cavity (+2 to +3), outlet (+4 to+5)

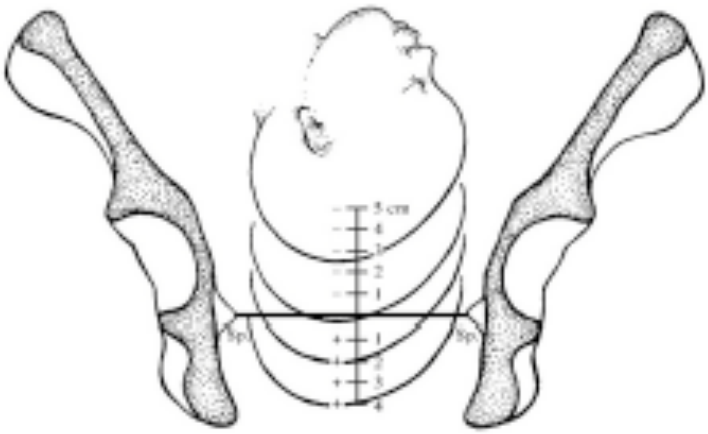


Figure 4.3.1: Illustration of position (vertex in the cephalic presentation) as it relates to the ischial spines of the maternal pelvis

Procedure for assisted vacuum delivery

1. Ensure the equipment is in working order by testing on a gloved hand.
2. Explain the procedure and why you are recommending it to the patient and obtain informed consent. Explain that she has tried very hard to deliver her baby but that she now needs some help. Emphasise that it will be a joint effort and that you will be pulling as she pushes, but that it will still be essential for her to push when requested. Offer to show the patient the vacuum cup.
3. Position the patient in the lithotomy position but semi-recumbent. She should not be flat on her back.
4. Inflitrate the perineum with local anaesthetic. It is good practice to do this whether or not an episiotomy is planned. During assisted vaginal delivery the perineum stretches much more rapidly that during crowning in normal labour and this is very painful. It is kind and respectful to provide analgesia.
5. Warn the patient that cup insertion is likely to be painful but it will be very quick.
6. Hold the cup in the vertical axis to insert. Place two fingers of your free hand in the posterior fourchette and depress to make room for the cup insertion.
7. Try to avoid the cup scraping over the clitoris and urethral orifice as this would be very painful. Bruising to the urethral orifice may lead to a risk of urinary retention later.
8. Once the cup is within the vagina it should be orientated into a horizontal position ready for application to the flexion point.

Facilitator: Place the Lucy in her mum and change the position in low and mid-cavity for each participant until they get it right.

4.4 Recognising and preventing complications | Workshop

Equipment

- ☐ Whiteboard / flip chart + pens

Key learning objectives

- Recognize maternal and newborn complications associated with AVD
- Discuss prevention of complications
- Discuss management of complications

Instructions for the facilitator

This is a discussion lead by the facilitator. Please ensure that all trainees actively participate in the session.

Facilitator: What complications are associated with assisted operative vaginal delivery?

Expect a discussion around the following:

Maternal complications

- Vaginal tissue entrapment under the cup: Vagina and labia minora are at risk of being trapped beneath the cup when the fetal head is at the pelvic outlet (station +4/+5). Careful examination before applying traction to rule out any tissue entrapment is mandatory. This will be covered in the technique breakout sessions.
- Anal sphincter and ano-rectal injury are more common with forceps compared to vacuum deliveries. (See Chapter on OASIS for examination after delivery to rule out obstetric anal sphincter injuries). With vacuum preformed without an episiotomy, OASIS is more common as compared to a normal delivery, but vacuum with an episiotomy results in a reduced risk of OASIS.
- Sequential deliveries using multiple instruments are associated with a greater incidence of both maternal and newborn complications. The risk of intra-ventricular haemorrhage is increased almost 3-fold (adjusted odds ratio of 2.22 (1.24-3.97)). The risk of intracranial haemorrhage, retinal haemorrhage and feeding difficulty is also greater (RCOG 2011).
- Risk factors associated with sphincter damage include the following
    - Nulliparity, large fetal size
    - Prolonged second stage of labour
    - Persistent occipito-posterior position
    - Episiotomy (depending on the angle of incision, see OASIS chapter)

Neonatal complications (Vacca 2003, RCOG 2020)

- Cosmetic scalp effects
  - Chignon
  - Cup discoloration and bruising
- Clinically non-significant injuries
  - Retinal haemorrhage (1-29%)
  - Blisters
  - Superficial scalp abrasions (2-10%)
  - Cephalohaematoma (6-11%)
  - Subcutaneous haematoma
  - Mild jaundice (3-30%)
- Clinically significant injuries
  - Extensive or deep scalp lacerations
  - Sub-galeal (sub-aponeurotic) haematoma (<0.5%)
  - Intracranial haemorrhage (<0.3%)
  - Skull fracture (<0.1%)
  - Severe anaemia
- Indirect and coincidental effects
  - Brachial plexus injury
  - Fracture of clavicle associated with shoulder dystocia
  - Neonatal respiratory depression in an infant with pre-existing signs of fetal compromise in utero

Facilitator: How can you distinguish chignon, cephalohaematoma and sub-galeal haematoma?

Expect discussion around (and use the table below to explain the distinguishing features):

Table 4.4.1: Distinguishing features of chignon, cephalohaematoma & sub-galeal haematoma

	Chignon	Cephalohematoma	Sub-galeal haematoma
Neonatal effect	Cosmetic scalp effects	Non-clinically significant injury	Clinically significant effect
Relationship to periosteum	Above	Below	Above
Relationship to aponeurosis	Above	Below	Below
Crosses the suture lines	Yes	No	Yes
Gravity dependent	No	No	Yes
Neonatologist management	No	Yes	Yes

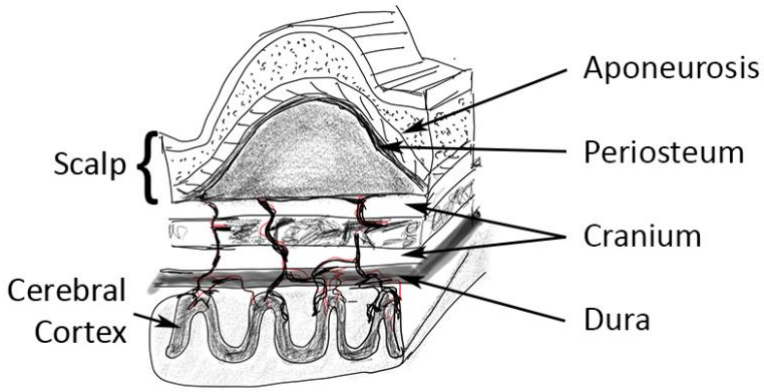


Figure 4.4.1: Cross section of the newborn skull, illustrating cephalohaematoma

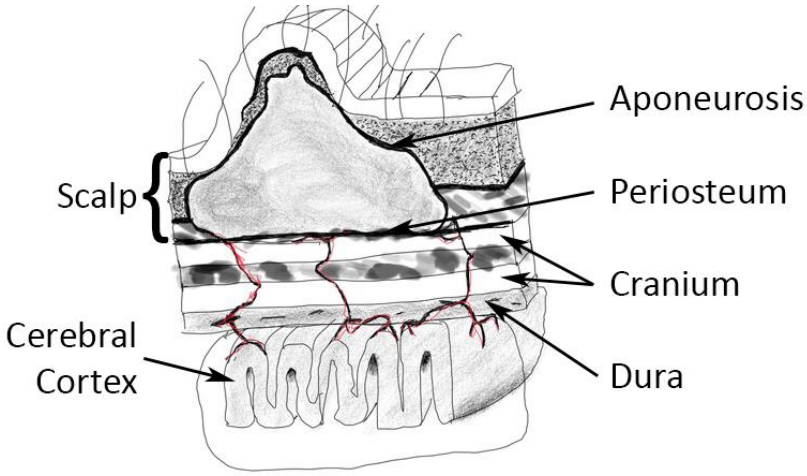


Figure 4.4.2: Cross section of the newborn skull, illustrating sub-galeal haematoma

Facilitator: How can complications be avoided?

Expect discussion around the following:

- Adequate training of clinicians, this affects the instrument of choice
- Adequate case selection based on good clinical examination, history and adherence to valid indications
- Discipline on when to stop trying (after three pulls, maximum 15 minutes)
- Likelihood of injuries more when:
    - Prolonged traction: Do not maintain traction between contractions, no need to reduce pressure between contractions
    - Sudden cup detachment: Adequate placement of the non-pulling hand, providing counter traction, stopping and re-achieving optimal suction pressure if pressure loss is identified (gauge, hissing sound of air escaping between the cup and scalp and lifting of the cup from the scalp)
    - Abrasions are unlikely to occur without cup detachment

Assisted vaginal delivery breakout sessions 2

4.5 Flexion point location, insertion distance determination and cup placement | Skill

Equipment

- ☐ Whiteboard / flip chart + pens
- ☐ Participant self-assessment progression sheet
- ☐ AVD training monitoring sheet
- ☐ Plastic graduated uterine sound or clear school rulers x 8
- ☐ Lucy and mum model x 2 (each with 2 clamps)
- ☐ Kiwi omni cup x 4
- ☐ Water based gel x 2
- ☐ Towel or wipes x 2
- ☐ Talcum powder x 2

Key learning objectives

- To determine the flexion point
- To calculate the insertion distance
- To correctly place the cup

Instructions for the facilitator

This is a skills station, with 2 models and no more than 8 participants per 30-minute session. The faculty should ensure that each participant has a self-assessment progression sheet, at the end of each hands-on practice, they should indicate on their sheet the placement of the cup after each attempt. They should retain the sheet throughout the day.

The facilitator should demonstrate the key steps to achieve the learning objectives within 5 minutes. Then the group is split into two and practice on the models for 20 minutes. The last 5 minutes of the session will be for reflection and feedback from participants of key learning points/take home messages.

Faculty: Draw the attention of the participants to the 6 and 11cm marks on the stem of the Kiwi Omni cup. Show the participants how to measure the distance from the tip of their middle finger to the proximal interphalangeal joint (usually 5-6cm) and from the finger-tip to the metacarpo-phalangeal joint (usually 10-11cm). Use the uterine sound or clear school ruler to do this. All participants should take note of their measures as this will be useful in the subsequent AVD breakout sessions.

Instruct all participants to put on appropriately sized gloves which they should keep on until the end the breakout session. At which point they discard them into the bin provided before leaving the room.

Facilitator: At a low (+2/+3) or outlet (+4/+5) station alter the head for each position, ask them to locate the position and then calculate the insertion distance, once this step is successful, ask the participant to place the cup and apply suction pressure. Start with an anterior position (DOA, LOA, ROA). Document the relevant information for each participant on the AVD training monitoring sheet.

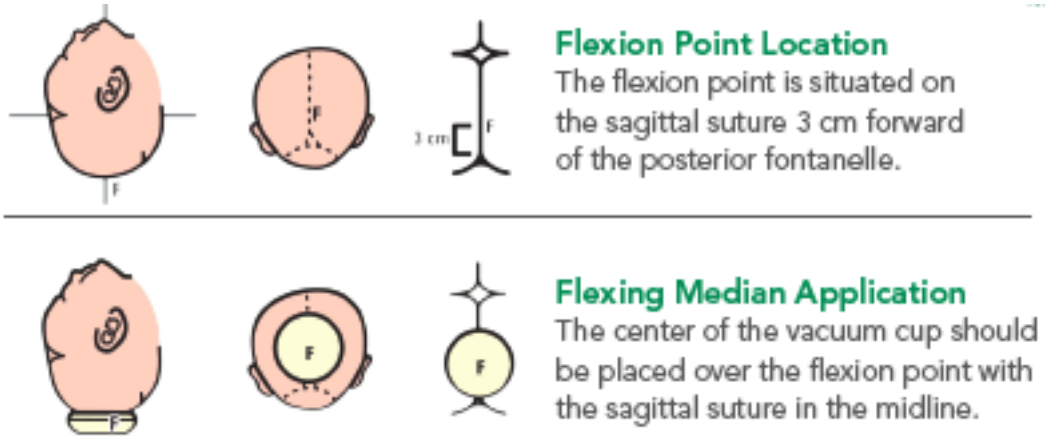


Figure 4.5.1: Flexion point location (Source: Vacca A)

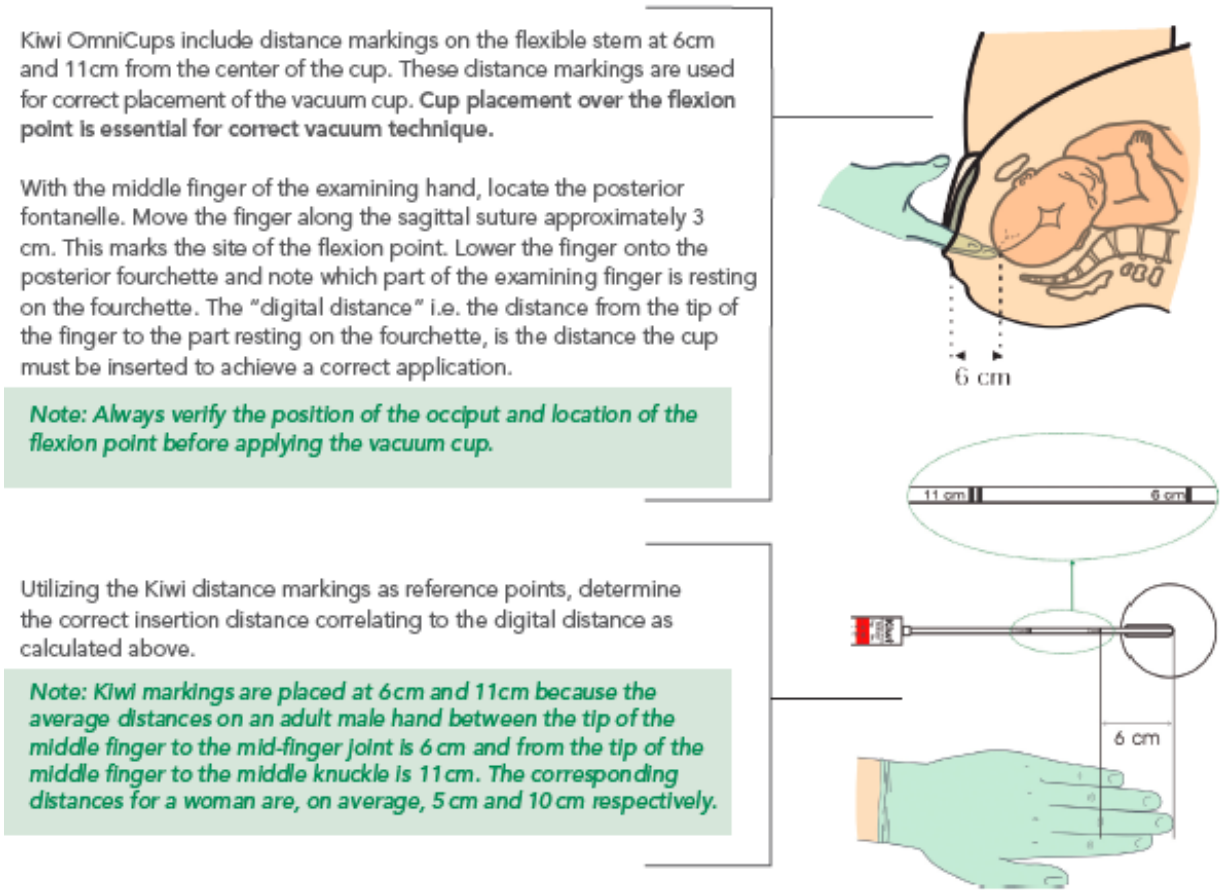


Figure 4.5.2: Determining the insertion distance (Source: Vacca A)

The non-pulling-hand and the direction of pull

You should only pull when:

- You have achieved maximum pressure
- The patient has a contraction and you have asked her to push, reassuring her that you will assist her
- You have ruled out any tissue trapped between the cup and the baby's head by checking around the cup with your index finger

Pulling

- Position your non-pulling hand. The index finger of your non-pulling hand should be on the baby's head while your thumb should be on the cup. This non-pulling hand should provide counter traction. With the index finger you should appreciate descent as the head comes down the pelvis with each pull. Your thumb should lift if the cup is lifting off the scalp, in which case you will also hear a hissing sound and notice that you are losing pressure (look at the gauge). At this point you stop, reassess and reapply pressure. If all the rules are adhered to you should not have a pop off. With each pop off, the risk of neonatal complications increases.
- The direction of pull should always be at right angles to the cup and in the midline of the maternal pelvis.
- Ensure you have the appropriate height of the delivery bed for the operator. This is important as it ensures that you get the angles right and you do not pull at an acute angle or away from the midline of the maternal pelvis. If necessary you should alter the height of the bed, sit on a chair or kneel on one knee.

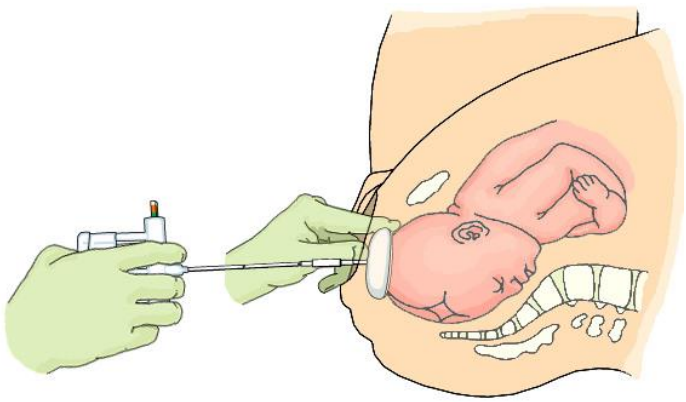


Figure 4.5.3: The non-pulling hand and the direction of pull

Other key points relevant to the correct technique

- Traction should be smooth, avoid jerky movements, rotation or side-to-side movement
- There is no need to sustain pressure when a contraction is over
- If more than one pull is carried out during a contraction, it is recorded as one pull
- Only about 11kg of traction force is required (Vacca, 2003)

Common causes of pop-offs

Preventable

- Misplaced cup, not on the flexion point
- Excessive traction (>25 lbs./11kgs)
- Inappropriate axis of traction
- Inadequate vacuum level (not at the top of the green, 600mmHg / 0.8kg/cm)
- Excess fluid pulled into system
- Poor maternal effort
- Faulty equipment

Not Preventable

- Severe caput/moulding/oedema
- Excessive hair
- Large fetus (≥4000gms)
- Primigravid patients

Procedure for assisted vacuum delivery

1. Ensure the equipment is in working order by testing on a gloved hand.
2. Explain the procedure and why you are recommending it to the patient and obtain informed consent. Explain that she has tried very hard to deliver her baby but that she now needs some help. Emphasise that it will be a joint effort and that you will be pulling as she pushes, but that it will still be essential for her to push when requested. Offer to show the patient the vacuum cup.
3. Position the patient in the lithotomy position but semi-recumbent. She should not be flat on her back.
4. Inflitrate the perineum with local anaesthetic. It is good practice to do this whether or not an episiotomy is planned. During assisted vaginal delivery the perineum stretches much more rapidly that during crowning in normal labour and this is very painful. It is kind and respectful to provide analgesia.
5. Warn the patient that cup insertion is likely to be painful but it will be very quick.
6. Hold the cup in the vertical axis to insert. Place two fingers of your free hand in the posterior fourchette and depress to make room for the cup insertion.
7. Try to avoid the cup scraping over the clitoris and urethral orifice as this would be very painful. Bruising to the urethral orifice may lead to a risk of urinary retention later.
8. Once the cup is within the vagina it should be orientated into a horizontal position ready for application to the flexion point.

Assisted vaginal delivery breakout sessions 3

4.6 Anterior and transverse positions | Skill

Equipment

- ☐ Whiteboard / flip chart + pens
- ☐ Participant self-assessment progression sheet
- ☐ AVD training monitoring sheet
- ☐ Plastic graduated uterine sound or clear school rulers x 8
- ☐ Lucy and mum model x 2 (each with 2 clamps)
- ☐ Kiwi omni cup x 4
- ☐ Water based gel x 2
- ☐ Towel or wipes x 2
- ☐ Talc powder x 2

Key learning objectives

- At the end of the session, participants will be able:
- To determine the flexion point, to calculate the insertion distance and to correctly place the cup
- Correctly apply the 5-step technique
- Apply traction in the midline of the maternal pelvis, with the stem at right angles to the cup
- Practice delivery of anterior positions
- Practice mid cavity / rotational deliveries

Instructions for the facilitator

This is a skills station, with 2 models and no more than 8 participants per 30-minute session. The faculty should take note of each participant self-assessment progression sheet, were they should have indicated their cup placements from the previous session. The sheet should be retained throughout the OVD breakout sessions.

The facilitator should demonstrate the key steps to achieve the learning objectives within 5 minutes. Then the group is split into two and practice on the models for 20 minutes. The last 5 minutes of the session will be for reflection and feedback from participants of key learning points/take home messages.

This breakout session builds on the skills acquired for identification of the flexion point, the lecture and Flexion point, insertion distance determination and cup placement breakout sessions. (Figure 4.6.1)

Instruct all participants to put on appropriately sized gloves which they should keep on until the end the breakout session. At which point they discard them into the bin provided before leaving the room.

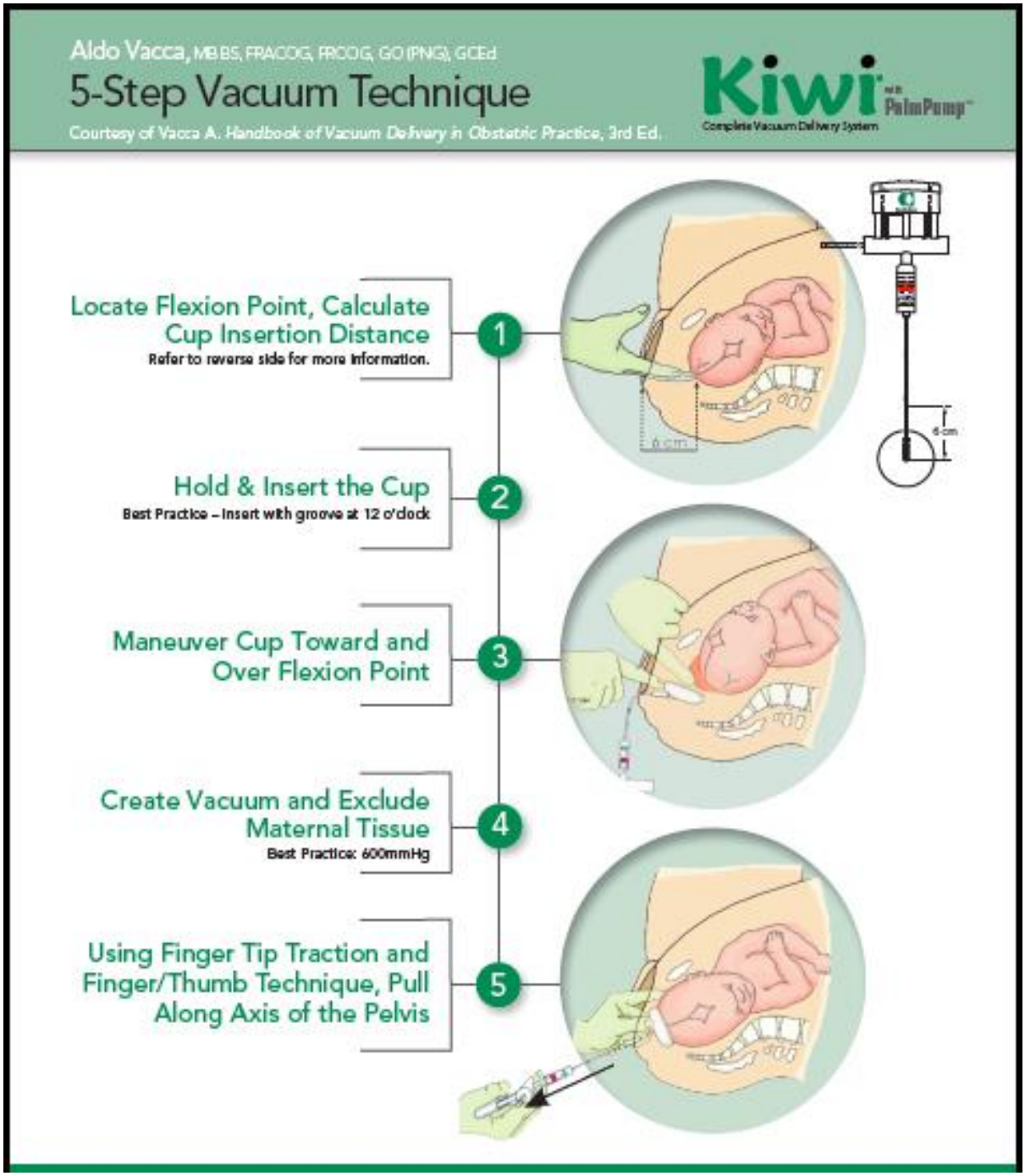


Figure 4.6.1: 5 step vacuum technique (Source: Vacca A)

Procedure for assisted vacuum delivery

1. Ensure the equipment is in working order by testing on a gloved hand.
2. Explain the procedure and why you are recommending it to the patient and obtain informed consent. Explain that she has tried very hard to deliver her baby but that she now needs some help. Emphasise that it will be a joint effort and that you will be pulling as she pushes, but that it will still be essential for her to push when requested. Offer to show the patient the vacuum cup.

3. Position the patient in the lithotomy position but semi-recumbent. She should not be flat on her back.
4. Inflitrate the perineum with local anaesthetic. It is good practice to do this whether or not an episiotomy is planned. During assisted vaginal delivery the perineum stretches much more rapidly that during crowning in normal labour and this is very painful. It is kind and respectful to provide analgesia.
5. Warn the patient that cup insertion is likely to be painful but it will be very quick.
6. Hold the cup in the vertical axis to insert. Place two fingers of your free hand in the posterior fourchette and depress to make room for the cup insertion.
7. Try to avoid the cup scraping over the clitoris and urethral orifice as this would be very painful. Bruising to the urethral orifice may lead to a risk of urinary retention later.
8. Once the cup is within the vagina it should be orientated into a horizontal position ready for application to the flexion point.

Facilitator:

Anterior position:

At a low (+2/+3) or outlet (+4/+5) station alter the position for each participant, ask them to locate the position and then calculate the insertion distance, one this step is successful, ask the participant to place the cup and apply suction pressure. Alter the anterior position (DOA, LOA, ROA) for different participants. Document the relevant information for each participant on the AVD training monitoring sheet.

Transverse position:

At mid-cavity (0 to +1) and low (+2/+3) station alter the position for each participant, ask them to locate the position and then calculate the insertion distance, once this step is successful, ask the participant to place the cup and apply suction pressure. Alter the transverse position (LOT, ROT) for different participants. Document the relevant information for each participant on the AVD training monitoring sheet.

Facilitator:

Emphasize that the flexion point tends to remain in the midline (Figure 4.6.2). Since the flexion point is located on the fetal head anterior to the posterior fontanelle, it will move through a much smaller arc in the birth canal than that of the posterior fontanelle and therefore will be situated closer to the midline of the mother's birth canal irrespective of position and attitude of the head. However, station, position, and attitude will alter the distance of the FP from the introitus. For practical purposes, therefore, the vacuum cup should be inserted the calculated insertion distance along the midline axis of the maternal pelvis without the need for significant lateral movement.

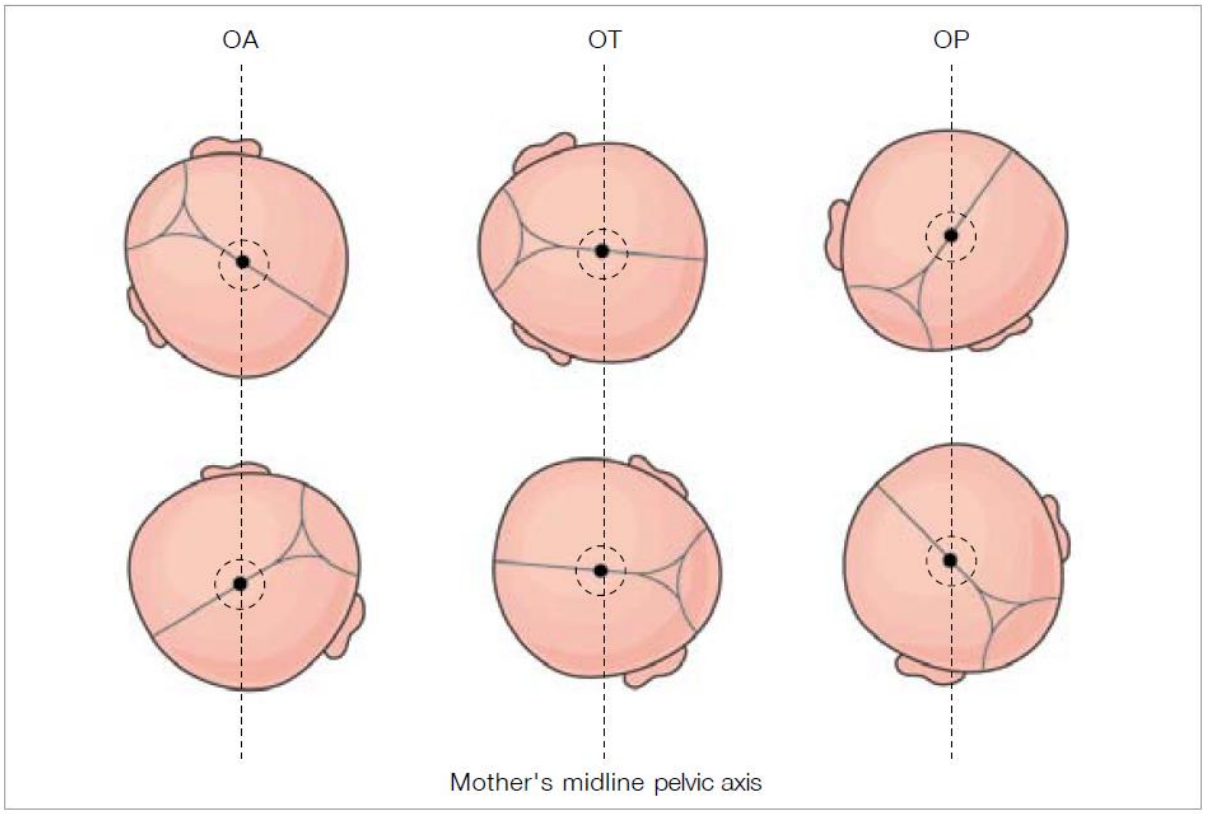


Figure 4.6.2: Tendency of the flexion point to remain in the midline irrespective of the position (Source: Vacca)

4.7 Transverse and posterior positions (Station 2 & 3)

Equipment

- ☐ Whiteboard / flip chart + pens
- ☐ Participant self-assessment progression sheet
- ☐ AVD training monitoring sheet
- ☐ Plastic graduated uterine sound or clear school rulers x 8
- ☐ Lucy and mum model x 2 (each with 2 clamps)
- ☐ Kiwi omni cup x 4
- ☐ Water based gel x 2
- ☐ Towel or wipes x 2
- ☐ Talc powder x 2

Key learning objectives

- At the end of the session, participants will be able to determine the flexion point, to calculate the insertion distance, to correctly place the cup
- Correctly apply the 5-step technique
- Apply traction in the midline of the maternal pelvis, with the stem at right angles to the cup
- Practice delivery of Transverse and posterior positions
- Practice mid cavity/rotational deliveries

Instructions for the facilitator

This is a skills station, with 2 models and no more than 8 participants per 30-minute session. The facilitator should take note of each participant's self-assessment progression sheet, where they should have indicated their cup placements from the previous session. The sheet should be retained throughout the AVD breakout sessions.

The facilitator should demonstrate the key steps to achieve the learning objectives within 5 minutes. Then the group is split into two and practice on the models for 20 minutes. The last 5 minute of the session will be for reflection and feedback from participants of key learning points/take home messages.

This breakout session builds on the skills acquired for identification of the flexion point, and insertion distance determination and cup placement (Figure 4.6.1) breakout sessions.

Instruct all participants to put on appropriately sized gloves which they should keep on until the end the breakout session. At which point they discard them into the bin provided before leaving the room.

Procedure for assisted vacuum delivery

1. Ensure the equipment is in working order by testing on a gloved hand.
2. Explain the procedure and why you are recommending it to the patient and obtain informed consent. Explain that she has tried very hard to deliver her baby but that she now needs some help. Emphasise that it will be a joint effort and that you will be pulling as she pushes, but that it will still be essential for her to push when requested. Offer to show the patient the vacuum cup.
3. Position the patient in the lithotomy position but semi-recumbent. She should not be flat on her back.
4. Inflitrate the perineum with local anaesthetic. It is good practice to do this whether or not an episiotomy is planned. During assisted vaginal delivery the perineum stretches much more rapidly that during crowning in normal labour and this is very painful. It is kind and respectful to provide analgesia.
5. Warn the patient that cup insertion is likely to be painful but it will be very quick.
6. Hold the cup in the vertical axis to insert. Place two fingers of your free hand in the posterior fourchette and depress to make room for the cup insertion.
7. Try to avoid the cup scraping over the clitoris and urethral orifice as this would be very painful. Bruising to the urethral orifice may lead to a risk of urinary retention later.
8. Once the cup is within the vagina it should be orientated into a horizontal position ready for application to the flexion point.

Facilitator:

Transverse position

At mid-cavity (0 to +1) and low (+2/+3) station alter the position for each participant, ask them to locate the position and then calculate the insertion distance, once this step is successful, ask the participant to place the cup and apply suction pressure. Alter the transverse position (LOT, ROT) for different participants. Document the relevant information for each participant on the AVD training monitoring sheet.

Posterior position

At mid-cavity (0 to +1) and low (+2/+3) alter the position for each participant (DOP, LOP, ROP), ask them to locate the position and then calculate the insertion distance, once this step is successful, ask the participant to place the cup and apply suction pressure. Alter the posterior position (DOP, LOP, ROP), for different participants. Document the relevant information for each participant on the AVD training monitoring sheet.

Facilitator:

Emphasize that the flexion point tends to remain in the midline (Figure 4.6.2). For practical purposes, therefore, the vacuum cup should be inserted the calculated insertion distance along the midline axis of the maternal pelvis without the need for significant lateral movement.

4.8 Documentation and audit of practice | Workshop

Equipment

- ☐ Whiteboard / flip chart + pens
- ☐ Laminated sample AVD record

Key learning objectives

- Discuss the common pit falls associated with AVD
- Discuss when to abandon the procedure
- How to advise women about future deliveries
- Properly document AVD procedure
- Conduct regular audit of AVD practice

Instructions for the facilitator

This is a discussion lead by the facilitator. Please ensure that all trainees actively participate in the session.

Facilitator: What are the common pitfalls associated with AVD?

Expect a discussion around:

Common causes of pop-offs

- **Preventable**
  - Misplaced cup, not on the flexion point
  - Excessive traction (>25 lbs./11kgs)
  - Inappropriate axis of traction
  - Inadequate vacuum level (not at the top of the green, 600mmHg / 0.8kg/cm)
  - Excess fluid pulled into system
  - Poor maternal effort
  - Faulty equipment

- **Not Preventable**
  - Severe caput/moulding/oedema
  - Excessive hair
  - Large fetus (≥4000gms)
  - Primigravid patients

Facilitator: When do you abandon the procedure?

Expect a discussion around:

Assisted vacuum delivery should be abandoned if

- If there is no evidence of progressive descent with moderate traction during each contraction
- If delivery is not imminent following three contractions of a correctly applied instrument by an experienced operator.
- 15 minute total time limit
- If the vacuum cup detaches ("pops-off") more than twice

Note Please beware of sequential deliveries (forceps following vacuum), as this caries a significantly increased risk of intracranial haemorrhage.

Facilitator: What advice should you give for future deliveries?

Expect a discussion around:

Women should be encouraged to aim for spontaneous vaginal delivery in subsequent pregnancies there is a high probability of success. The procedure itself doses increase the risk of a non-successful vaginal delivery.

Facilitator: Why is documentation and audit of practice important?

It is good practice to regularly audit assisted vaginal deliveries. But the audit will only be meaningful if good records are kept of every procedure. An example of assisted vaginal delivery record is provided as

ASSISTED VAGINAL BIRTH RECORD

Patient details: (addressograph)

Operator: Grade:
Supervisor: Grade:

Indication (s) for birth: .....

Classification of OVB: Outlet □ Low □ Mid-pelvic □ Rotation > 45^0 Yes □ No □

Classification of CTG: Normal □ Suspicious □ Pathological □ **Liquor**: Clear □ Meconium □ None seen □

Prerequisites:
Place of birth Labour Room □ Theatre □
Analgesia Local □ Pudendal □ Regional □
Consent Verbal □ Written □
Bladder emptied Yes □ No □

Examination
1/5ths per abdomen: 0 □ +1 □
Dilatation: Fully □
Position: OA□ LOA□ ROA□ OP□ LOP□ ROP□ LOT□ ROT□
Station: 0□ +1□ +2□ +3□
Caput: 0□ +□ ++□ +++□
Moulding: 0□ +□ ++□ +++□

Procedure
Instrument used (tick all)
Vacuum: Sialastic □ Kiwi □ Metal anterior □ Metal posterior □
Forceps: Rotational □ Non-rotational □ Outlet □

Number of pulls:

Traction: Gentle □ Moderate □ Strong □

Maternal effort: Sub-optimal □ Optimal □

Placenta: Physiological □ CCT □ Manual □

Episiotomy: Yes □ No □
Perineal tear: 1st degree □
2nd degree □
3rd / 4th degree □ *(complete proforma)*
Other □ *(complete proforma)*

Multiple instrument use Yes □ No □
Examination before second instrument
1/5ths per abdomen 0 □ +1 □
Position: OA□ LOA□ ROA□ OP□ LOP□ ROP□ LOT□ ROT□
Station: 0□ +1□ +2□ +3□
Caput: 0□ +□ ++□ +++□
Moulding: 0□ +□ ++□ +++□

Decision for second instrument:
.....
.....

Time of decision:
Time instrument applied:
Time second instrument applied:
Time of birth:

EBL.....

Baby: M □ F □ Birth weight..... (g) Apgar: 1....5.....10.... **Cord pH**: Arterial ..... Venous.....
Post-birth care: **Base excess:** Arterial ..... Venous.....

Level of Care	Routine □ High Dependency □	
Syntocinon infusion	Y □ N □	
Catheter	Y □ N □	Remove.....
Vaginal Pack	Y □ N □	Remove.....
Analgesia prescribed:	Y □ N □	Diclofenac 100mg PR Y □ N □
Thromboembolic Risk:		Low □ Medium □ High □ *(complete VTE assessment proforma)*
Thromboprophylaxis prescribed:		Y □ N □

Additional details: (use additional operation note if needed)

Template to be adapted for local use

Signature:..... **Date:**.....

- Figure 4.8.1.

- Audit should be carried out to improve practice of AVD as a unit and for the individual. It may also be useful in knowing were training should focus.

Facilitator: What indicators will be useful when conducting an audit?

Expect a discussion around:

Some useful indicators to determine during an audit include the following:

- percentage of women with failed assisted vaginal delivery
- rate of sequential instrument use
- case notes review to audit appropriate management of women with failed assisted vaginal delivery or
- sequential instrument use, i.e. when to use a sequential instrument and when to abandon
- percentage of women with third- and fourth-degree perineal tears
- rate of neonatal morbidity, composite trauma (sub-galeal haemorrhage/brachial plexus injury/fracture/facial
- nerve palsy/cerebral haemorrhage), low Apgar <7 at 5 minutes and cord arterial pH <7.1
- documentation of written or verbal consent for operative vaginal delivery
- documentation of written consent for trial of assisted vaginal delivery in the operating theatre
- accuracy of documentation.

ASSISTED VAGINAL BIRTH RECORD

Patient details: (addressograph)

Operator: Grade:
Supervisor: Grade:

Indication (s) for birth: .....

Classification of OVB: Outlet □ Low □ Mid-pelvic □ Rotation > 45^0 Yes □ No □

Classification of CTG: Normal □ Suspicious □ Pathological □ **Liquor**: Clear □ Meconium □ None seen □

Prerequisites:
Place of birth Labour Room □ Theatre □
Analgesia Local □ Pudendal □ Regional □
Consent Verbal □ Written □
Bladder emptied Yes □ No □

Examination
1/5ths per abdomen: 0 □ +1 □
Dilatation: Fully □
Position: OA□ LOA□ ROA□ OP□ LOP□ ROP□ LOT□ ROT□
Station: 0□ +1□ +2□ +3□
Caput: 0□ +□ ++□ +++□
Moulding: 0□ +□ ++□ +++□

Procedure
Instrument used (tick all)
Vacuum: Sialastic □ Kiwi □ Metal anterior □ Metal posterior □
Forceps: Rotational □ Non-rotational □ Outlet □

Number of pulls:

Traction: Gentle □ Moderate □ Strong □

Maternal effort: Sub-optimal □ Optimal □

Placenta: Physiological □ CCT □ Manual □

Episiotomy: Yes □ No □
Perineal tear: 1st degree □
2nd degree □
3rd / 4th degree □ *(complete proforma)*
Other □ *(complete proforma)*

Multiple instrument use Yes □ No □
Examination before second instrument
1/5^{ths} per abdomen 0 □ +1 □
Position: OA□ LOA□ ROA□ OP□ LOP□ ROP□ LOT□ ROT□
Station: 0□ +1□ +2□ +3□
Caput: 0□ +□ ++□ +++□
Moulding: 0□ +□ ++□ +++□

Decision for second instrument:
.....
.....

Time of decision:
Time instrument applied:
Time second instrument applied:
Time of birth:

EBL.....

Baby: M □ F □ Birth weight..... (g) Apgar: 1....5.....10.... **Cord pH**: Arterial ..... Venous.....
Post-birth care: **Base excess:** Arterial ..... Venous.....
Level of Care Routine □ High Dependency □
Syntocinon infusion Y □ N □
Catheter Y □ N □ Remove.....
Vaginal Pack Y □ N □ Remove.....
Analgesia prescribed: Y □ N □ Diclofenac 100mg PR Y □ N □
Thromboembolic Risk: Low □ Medium □ High □ *(complete VTE assessment proforma)*
Thromboprophylaxis prescribed: Y □ N □

Additional details: (use additional operation note if needed)

Template to be adapted for local use

Signature:..... **Date:**.....

Figure 4.8.1: Assisted Vaginal Birth Record (RCOG2020)

AVD training monitoring Sheet

Name of facilitator_____ Date of training:_____ Location of training_____

Candidate No._____						
Registration number	Attempt	Position	Correctly determined position Y/N	Position of set up placement	Duration of delivery	Trainer comments (number of pop ups-1, 2, 3…), most difficult of 5 steps to apply
	1a	DOA				
	1b	DOA				
Cadre (MD, MW, CO etc)	2a	ROA				
	2b	LOA				
	3a	ROT				
Grade (Consultant, MO, CO, MWE/C, Staff nurse)	3b	LOT				
	4a	ROP				
	4b	LOP				
	5a	DOP				
Candidate No._____						
Registration number	Registration number	Position	Correctly determined position Y/N	Position of set up placement	Duration of delivery	Trainer comments (number of pop ups-1, 2, 3…), most difficult of 5 steps to apply
	1a	DOA				
	1b	DOA				
Cadre (MD, MW, CO etc)	2a	ROA				
	2b	LOA				
	3a	ROT				
Grade	3b	LOT				

(Consultant, MO, CO, MWI/C, Staff nurse)	4a	ROP				
	4b	LOP				
	5a	DOP				

Flexing median: FM	1
Right de-flexing para-median: RDfPM	2
Left de-flexing para-median: LDfPM	3
Right de-flexing para-median: RDfPM	4
Left de-flexing para-median: LDfPM	5
Left flexing para-median: LfPM	6
Right flexing para-median: RfPM	7

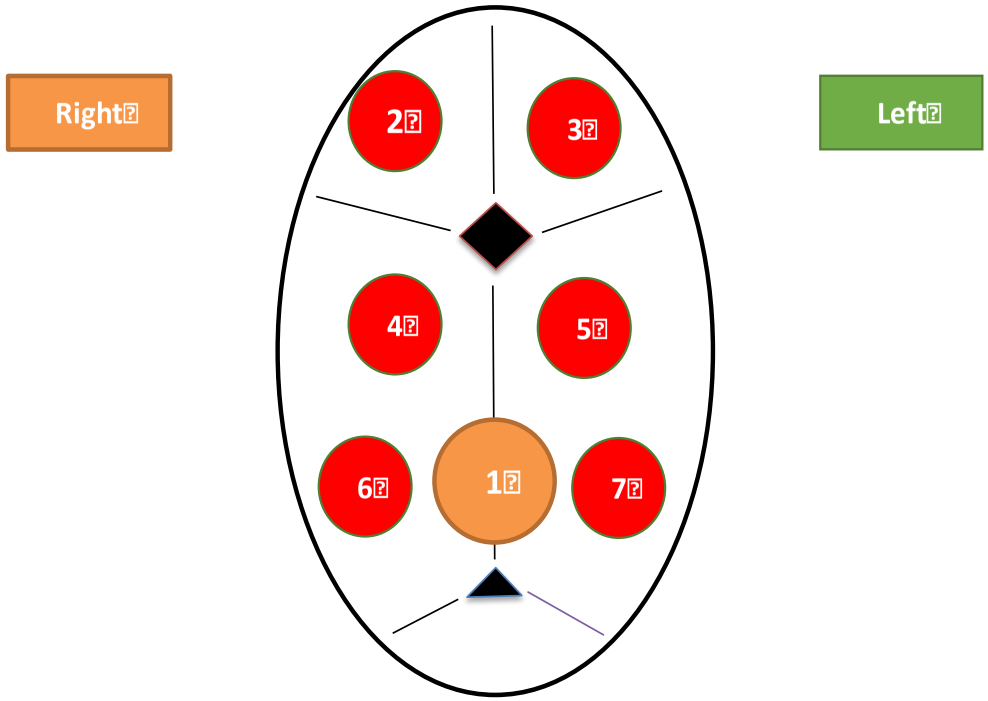


Figure 4.8.2: AVD training monitoring sheet

References

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Ameh, C. and Weeks, A. (2009). The role of instrumental vaginal delivery in low resource settings. BJOG, 116 (Suppl. 1), pp.22–25.

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Module 5: Surgical Obstetric Interventions

Surgical techniques breakout sessions 1

5.1 Knot tying and double layer uterine closure | Skill

Equipment

- ☐ Surgical sutures with curved needles X 7 (one each for participants and facilitator)
- ☐ Lengths of thread for knot-tying
- ☐ Model uteri with incisions X 7
- ☐ Needle holders X 7
- ☐ Scissors X 7
- ☐ Spencer Wells forceps X 7
- ☐ Green-Armytage clamps X 14
- ☐ Non-toothed forceps X 7

Key learning objectives

- To gain competence in tying one-handed knots
- To gain competence in double-layered uterine closure

Instructions for the facilitator

This is a skill session composed of two parts:

1. Knot tying
2. Uterine closure (double layer)

The facilitator will demonstrate the skills to the participants then each participant will practice the skills.

Lay out the equipment distributed so that each participant has one model uterus, one needle holder, one pair of scissors, one Spencer Wells forceps, one non-toothed forceps, 4 Green-Armytage clamps, one suture and some lengths of thread. One set of equipment is for the facilitator to sue to demonstrate.

Knot tying

1. Demonstrate the components of single-handed knot tying to participants in a step-wise manner as shown on the DVD.
2. Ensure all participants practice single-handed knot tying ensuring reef knots not granny knots by doing throws in two different directions.
3. Demonstrate knot tying using Spencer Wells with a short thread.
4. Emphasise safe practice of ALWAYS turning needle to face needle holder while tying knots.

Uterine closure

Using the model uterus, demonstrate double layer closure using the following steps, then ask the participants to close the uterus using the same steps:

1. Apply Green Armytage clamps either side of the uterine angles.
2. Suture and tie each end of the incision, starting with the right end (as in the patient's right).
3. Then tie off the left end of the incision, and continue to suture across the incision. Explain that because of the attachment to the upper segment, in real life the upper edge of the incision can seem shorter than the lower edge and this should be allowed for by taking very slightly wider bites on the bottom side as compared to the top.
4. Ensure that some raw tissue more superficially is left for closure of the second layer.
5. Close with non-locked sutures.
6. Discuss that extra sutures may be needed for any areas of residual bleeding.
7. Sutures should not be pulled so tightly that they cut through.

5.2 Management of a deteriorating patient in theatre | Scenario

Equipment

- ☐ Theatre table/bed
- ☐ BP machine
- ☐ Pulse oximeter
- ☐ Wedge
- ☐ IV fluids
- ☐ Cannulae x2
- ☐ Blood bottles
- ☐ Laryngoscope
- ☐ ET tube
- ☐ NLS algorithm for anaphylaxis treatment

Key learning objectives

- To appreciate the role of teamwork and communication in the management of a deteriorating patient in theatre
- To apply ABCDE in an on-table emergency

Instructions for the facilitator

Volunteers will be requested to play the roles of surgeon, anaesthetist, helpers and patient. The facilitator reads out the following scenario to the participants. After the scenario, the facilitator will lead a discussion on anaphylaxis during surgery.

Scenario

A 29-year old G3P2 patient is having an elective caesarean section because of two previous caesarean sections. She herself works as a nurse in the hospital. The caesarean section is being performed under spinal anaesthesia. The surgeon has just opened the uterus when the patient complains of feeling unwell and light headed, then stops talking.

The facilitator asks the participants to repeat the scenario to ensure they have grasped all the facts, then asks for volunteers to play the role of surgeon, anaesthetist and assistants. A participant can also play the patient.

The facilitator leads the scenario as follows. If the expected answers are not given the facilitator should probe gently until they are mentioned.

Facilitator: What would you do first?

Anaesthetist: Assess ABCDE

Facilitator: Please show me how you would do this?

Anaesthetist: I would assess the airway by look, listen and feel, then count the respiratory rate, note the oxygen saturations and auscultate the chest, take the BP and pulse.

Facilitator: You find that the patient is hypotensive with a blood pressure of 70/40 and pulse rate of 135/minute. The respiratory rate is 40/minute and the oxygen saturation probe is not reading. What would you do?

Anaesthetist: I would maintain the airway, give high flow oxygen and a rapid fluid bolus plus ephedrine. I would call for senior help.

Facilitator: The BP does not respond to these measures and remains low at 75/45, with ongoing tachycardia and tachypnoea. What could be the problem?

Anaesthetist: The problem could be a high spinal, blood loss or anaphylaxis. I would need to check with the surgeon as to whether there is significant blood loss and alert them to the problem.

Facilitator: There is minimal blood loss so far. What should you do?

Anaesthetist: I will assume this is an anaphylactic reaction and give adrenaline.

Facilitator: Say this is the right thing to do. What dose and route would you use for adrenaline in this situation?

Anaesthetist: I would give 500 micrograms by the intra-muscular route (0.5 mls of 1/1,000 (1mg/1ml vial)).

Facilitator (to the surgeon): What would you do?

Surgeon: Quickly deliver the baby, and ensure haemostasis to the wound edges with Green Armitage clamps then cover the wound with a sterile gauze and stop operating pending discussion with the anaesthetist.

Facilitator: The patient remains hypotensive following the adrenaline dose with a BP of 85/50. They are looking blue and the chest sounds wheezy on auscultation. What would you do now?

Anaesthetist: I would give a second dose of adrenaline, the same dose and route. I would prepare for general anaesthesia and intubation.

Facilitator: The Blood pressure remains low at 80/45 five minutes later. Oxygen saturation is now 88%. Now what would you do?

Anaesthetist: I would give intravenous adrenaline 50 micrograms. (0.5mls of 1/10,000 ((1 mg/10 mls)) and I would intubate the patient.

Facilitator: The patient responds to intravenous adrenaline and the BP starts to rise to 90/50. (speaking to the surgeon) What would you do now?

Surgeon: I would ask if I should continue the operation.

Facilitator: Is there anything you should do first?

Surgeon: I would re-scrub and apply latex free gloves. The patient is a health worker and the cause of anaphylaxis could be a latex allergy.

The facilitator leads a discussion on anaphylaxis during surgery and asks how common a problem this is (about 1 in 10,000 anaesthetics). They also discuss potential allergens, including antibiotics, muscle relaxants, chlorhexidine and other substances, including latex. All patients should be asked about any history of allergy and this should be mentioned in the WHO safe surgical check list.

Discuss the role of hydrocortisone and antihistamines in treating anaphylaxis.

Discuss post-operative care and the risk of relapse. Discuss the importance of counselling the patient.

If time permits, discuss anaphylaxis in pregnancy in general as a cause of sudden maternal collapse and review the treatment. Discuss whether a protocol or algorithm for treatment of anaphylaxis exists in the unit and how to write one. Show participants the NLS anaphylaxis algorithm.

5.3 Recognising and managing complications in theatre | Scenario

Equipment

- ☐ Monitoring simulator (on iPad or phone)
- ☐ BP cuff
- ☐ I.V. fluids
- ☐ Giving set
- ☐ Oxygen face mask
- ☐ Little Annie and cushion
- ☐ Theatre drape
- ☐ Syringe labelled tranexamic acid 1g
- ☐ Condom catheter balloon

Key learning objectives

- To recognise the deteriorating patient on the theatre table.
- To take appropriate and timely action to save a life using a structured approach

Instructions for the facilitator

The facilitator reads the scenario to the participants then asks them to feedback the main points to ensure they have understood the scenario. At the same time, the facilitator maintains and adjusts the parameters on the monitoring simulator.

The facilitator asks for volunteers to play the roles of anaesthetist, surgeon and assistant. The facilitator guides the participants to the correct answers to the questions.

Scenario

A patient who has had three previous caesarean sections is having a caesarean section under spinal anaesthesia. The patient is anaemic with a pre-operative Haemoglobin of 9g/dl. The lower segment appeared to be very thin. An intern is performing the procedure. Following the delivery of the baby and the placenta (which was found to be low in the uterine cavity), the patient is observed to be bleeding heavily from the uterine cavity. The patient has only had girl babies (including this one) and she and her husband are keen to have a son. The blood pressure at this point is 100/60, pulse 110/minute and Respirations 23/minute.

Facilitator: What should be done first?

Surgeon: I would explain to the anaesthetist that the patient is bleeding heavily and the loss is not yet under control. I would ask them to ensure that blood is cross matched.

Facilitator: How much blood?

Surgeon: As the loss has not settled and is heavy I would ask for 4 units, bearing in mind the patient was already anaemic.

Facilitator: What are you going to do to try to stop the haemorrhage?

Surgeon: I need to locate the source of the loss and determine if it is coming from within the uterine cavity, from the placental bed. If I can locate discrete bleeding points I will over-sew them.

Facilitator (to anaesthetist): What else should be done?

Anaesthetist: I would give oxygen to the patient. I would ensure I had two wide bore canulae in situ and increase the rate of infusion of normal saline or Ringer's lactate to 1 litre over 20 minutes as I wait for blood to arrive. I would draw up and administer 1g tranexamic acid over 10 minutes i.v. I would send blood for a clotting screen.

At this point the facilitator alters the monitoring simulator such that the BP is now 80/50, pulse 140/minute and respirations 35/minute. The simulator alarms.

Facilitator: Is there anything else that can be done?

Surgeon: I would ask my assistant to perform aortic compression. I would call for help and ask for a senior surgeon to attend. I would place a condom catheter balloon into the uterus and push the tail of the catheter through the cervix, then I would close the uterus.

Facilitator (to anaesthetist): The laboratory has phoned to say that blood for transfusion will be ready in 15 minutes. What would you do now?

Anaesthetist: I would speed up the infusion rate to as fast as possible. I would keep the patient warm and ensure that the oxygen is being given at high flow (10 litres per minute) Once one litre has run in I would commence another 1 litre. I would squeeze the bag to increase the infusion rate.

The facilitator alters the monitoring simulator again. The BP is 60/30, pulse 160/minute and respirations 40/minute. The simulator continues to alarm.

Facilitator: What should you do now? The condition of the patient is deteriorating and the blood loss is still not controlled? The lower segment is so thin that closure of the incision is very difficult and the bleeding is continuing.

Surgeon: The situation has reached a point where a hysterectomy should be performed. I would continue with aortic compression until the consultant arrives. I would ensure all bleeding points on the uterine incision are clamped with Green-Armytage clamps.

Anaesthetist: I would consider intubating the patient to help correct acidosis. I also need to monitor the urine output.

Discussion points

- Situational awareness: what does this mean and why is it so important?
- Communications within the team
- When to call for help
- What may influence decisions (human factors)
- How might blood loss be estimated?
- What could have been done to reduce risks in this case?
- How and where should the patient be cared for post-operatively?
- Should the decision for hysterectomy have been made earlier?
- Was it the right decision?

- Who should have done the caesarean section?

Reference

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 randomised, double-blind, placebo-controlled trial. The Lancet 389 (10084), pp. 2015-2116.

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5.4 Second stage and complex sections | Skill

Equipment

- ☐ Desperate Debra
- ☐ Lubricating gel
- ☐ Obstetric phantom and baby
- ☐ Caesarean incision cover

Key learning objectives

- To develop situational awareness in different difficult situations
- To practice delivering the fetal head in various different positions and degrees of difficulty

Instructions for the facilitator

The facilitator should familiarise themselves with the controls on the Desperate Debra mannequin.

1. Start with the fetal head in the occipito-anterior position, not deeply impacted (green level on the handle) and ask all participants in turn to attempt delivery.

2. Gradually increase the difficulty to medium and add in deflexed positions, including deflexed occipito-posterior.

Participants can work in pairs with an assistant pushing up from below for difficult cases as necessary.

Discuss, then ask participants to try using their left rather than right hands to decompress the impacted head. To do this they should remain on the right-hand side of the patient but turn to face the patient's feet and scoop backwards using their left hand. Ask participants to try this and discuss if this makes it easier to deliver the impacted head (it should)

Practice reverse breech extraction on the obstetric phantom with a caesarean incision cover over the abdomen

Surgical techniques breakout sessions 2: Perineal Repair

5.5 Third and fourth degree tear repair: Making a diagnosis, principles | Workshop

Equipment

- ☐ Whiteboard / Flip chart and pens
- ☐ Laminated anatomical poster of pelvic floor anatomy and anorectal complex
- ☐ Optional video (https://www.youtube.com/watch?v=XSRv3FdyL8g&t=410s)

Learning objectives

- To review the anatomy of the pelvic floor and OASIS
- To review classification of perineal trauma
- To appreciate risk factors for OASIS
- To learn how to mitigate risk where possible
- To become competent in taking informed consent for repair of OASIS
- To appreciate general principles of repair of OASIS

This session is a closed discussion led by the facilitator.

Ensure active participation by all participants.

Discuss the key terminologies to be used throughout this breakout session (ask participants what these terms mean, see table 5.5.1)

Obstetric Anal Sphincter Injuries (OASIS) refers to third and fourth degree tears. Anal incontinence is defined as the involuntary loss of flatus and/or faeces affecting the quality of life.

Anatomy of the pelvic floor

Facilitator: Use the laminated anatomical poster to:

- Lead a quick review of the anatomy of the pelvic floor
- Discuss the difference between the internal and external anal sphincters (IAS and EAS)

Classification for OASIS

1. **Revise the classification of perineal trauma** (see **Table 5.5.1**) with participants, write definitions on the flip chart.

Expect participants to discuss the classification.

- Use the poster to discuss the classification
- Anorectal mucosa should be used rather than anal epithelium

Table 5.5.1: Classification of perineal trauma

Classification	Description
First degree tear	Injury to the perineal skin and/or vaginal mucosa
Second degree tear	Injury to the perineum involving perineal muscles but not involving the anal sphincter
Third degree tear	Injury to perineum involving the anal sphincter complex • Grade 3a: Less than 50% of EAS thickness is torn • Grade3b: More than 50% of EAS thickness is torn • Grade 3c: Both EAS and internal anal sphincters (IAS) are torn
Fourth degree tear	Injury to perineum involving the anal sphincter complex (EAS and IAS) and anorectal mucosa

2. **Ask participants to discuss possible risk factors** and write on flip chart. Explain that it is not possible to predict who will sustain a third or fourth degree tear on the basis of risk assessment. Expect to discuss the following risk factors**:**

    - Asian ethnicity
    - Short perineum <2.5 cms from fourchette to anus
    - Induced labour
    - Nulliparity
    - High birth weight of baby
    - Occipito-posterior position
    - Duration of active second stage
    - Episiotomy (including angle of cut)
    - Assisted vaginal delivery with and without episiotomy (forceps increased risk with and without episiotomy, vacuum increased without episiotomy but decreased with episiotomy)

3. **Ask participants about the incidence of third and fourth degree tears.** Discuss why the reported incidence might be inaccurate. Expect them to mention:

    - Under-reporting by patients due to embarrassment about symptoms
    - Failure to diagnose OASI
    - Lack of disclosure by clinicians who fear being blamed for OASIS

4. **Discuss possible means of prevention**

Expect a discussion around the following:

- Episiotomy as a routine is not preventative but angle of episiotomy is important.
- Emphasise how perineal stretching as head crowns alters the position of the anal sphincter. Episiotomy should be medio-lateral at an angle of 60° to the midline to avoid the anal sphincter.
- Perineal protection when the head is crowning can be protective. Manual perineal protection / "hands on" techniques include:
    - Left hand slowing down the delivery of the head
    - Right hand protecting the perineum
    - Mother NOT pushing when head is crowning (**communicate**)
    - Think about episiotomy as indicated (risk groups and correct angle)
    - Warm compression during the second stage of labour reduces the risk of OASIS

5. **Discuss making the diagnosis**, how to examine the patient.

- All patients with perineal trauma should be examined to exclude or diagnose OASIS
- Examination best done with the patient in lithotomy if any doubt
- Good light and exposure, visual inspection
- Adequate analgesia
- Place finger in anal canal and use thumb in pill-rolling action to determine thickness of tissue in area of anal sphincter
- Differences in appearance between internal sphincter and external sphincter

Note Sometimes superficial tears to perineum may extend to the anal margin, this does not mean sphincter torn.

Facilitator: refer to laminated diagram and point out the difference between an anal sphincter tear and a tear to the superficial transverse perineal muscle

Remind participants to change gloves after anal/rectal examination

6. **General principles of repair**

- Informed consent (ask a participant to volunteer to practice obtaining informed consent*)
- Ideally performed in theatre
- Position in lithotomy
- Spinal anaesthesia
- Aseptic precautions
- Excellent light
- Good visualisation: Presence of an assistant or a self-retaining retractor
- A trainer and experienced surgeon
- The right equipment

- Use of the correct sutures
  - 3-0 polyglactin should be used for anorectal mucosa because it causes less irritation and discomfort compared to polydioxanone (PDS) sutures.
  - For repair of EAS/IAS, use monofilament sutures such as 3-0 PDS or braided sutures such as 2-0 polyglactin.
  - Bury any knots beneath the superficial perineal muscles to minimize the risk of the knot and suture migration to the skin.

Note Remember the first attempt has the best chance of success in terms of future continence.

* Refer to principles of informed consent in Chapter 2.2 in this manual.

References

Aasheim, V., Nilsen, A., Lukasse, M. and Reinar, L. (2011). Perineal techniques during the second stage of labour for reducing perineal trauma, Cochrane Database Syst Rev 12: CD 006672

Lone, F., Sultan, A. and Thakar, R. (2012). Obstetric pelvic floor and anal sphincter injuries. The Obstetrician & Gynaecologist, 14, pp.257–66.

Royal college of Obstetricians and Gynaecologists. (2015). The Management of Third and Fourth Degree Perineal Tears. Green-Top Guideline No. 29. Available at: https://www.rcog.org.uk/en/guidelines-research-services/guidelines/gtg29/

5.6 Third degree tear repair | Skill

Equipment

- ☐ Third/fourth degree trainer X6
- ☐ Needle holder, stitch scissors X6
- ☐ Toothed forceps X 6
- ☐ Allis forceps X12
- ☐ Langenbeck retractors X 12
- ☐ Small artery clips X 12
- ☐ Sutures X 6 (Vicryl 2.0)

Key learning objectives

- To appreciate the need to repair internal and external sphincters separately
- To practice safe repair techniques

Instructions for the facilitator

Remind the students of the film they have been watching:

1. Basic anatomy
2. Recognition of internal-smooth muscle and paler and external sphincters-striated muscle
3. EAS and IAS will retract when torn
4. Surgical techniques

Demonstrate on the model how to distinguish between the different types of third degree tears, Type 3A, 3B and 3C. Show them the internal sphincter on the model but discuss it may be more difficult to see in real life. Explain the importance of feeling the thickness of the residual tissue between the anus and the tear. If very thin, then it is very likely this is a 3C tear.

For repair of the EAS/IAS muscle, either a monofilament suture such as 3-0 PDS or braided sutures such as 2-0 poyglactin can be used with equivalent outcomes.

Explain that if the tear through the external anal sphincter is complete the ends can often retract into the surrounding tissues like an elastic band. The ends must be found and held with Allis forceps.

Explain that continence will be better if the internal sphincter is repaired separately.

Use the index finger and a thumb in a pill rolling technique to adequately examine the annual sphincter for damage.

Explain that ideally, third and fourth degree tears should be repaired in theatre with good lighting, analgesia/anaesthesia (spinal preferably), under aseptic conditions and with an assistant.

Demonstrate the following technique:

- Examine the tear carefully to identify the anal sphincter complex and determine the extent of the tear.
- Ask an assistant to hold the surrounding tissues back using the Langenbeck retractors.
- If the internal sphincter is torn, repair using interrupted mattress end-to-end sutures.
- During knot tying, remind participants about safe needle discipline. Turn the tip of the needle inwards in the needle holder so that the sharp tip is shielded by the needle holder and no-one can obtain a needle stick injury. THIS IS VERY IMPORTANT.
- For complete External sphincter tears, identify the ends of the external sphincter. Hold with Allis forceps and dissect as necessary to ensure that there is sufficient sphincter tissue available for an overlapping technique to be used.
- Suture using a mattress technique inserting needle from the proximal end of the upper side of the muscle on one side of the sphincter about 1.5 cms away from the edge. Bring suture out on underside.
- Take the same suture through the other side of the torn sphincter again from top to bottom, this time about 0.5 cms away from the edge of the tear. Next reverse the needle and come back from bottom to top about 1 cm more distally.
- Bring the suture through the first side of the torn sphincter again from bottom to top.
- Cut the suture, clipping the two ends with a small artery clip and leaving enough length to tie later.
- Repeat with another suture placed more distally in the external sphincter. Once the two sutures have been inserted, pull the ends together gently and tie off. Try not to pull too tightly to avoid the suture material cutting through the ends of the muscle, but at the same time, tight enough to ensure overlap and approximation of the tissues.

Explain that if the external sphincter tear is partial rather than complete repair should be end-to-end and not overlapping.

Say that the rest of the repair would be conducted as for a second-degree tear.

Note Figure of eight sutures should be avoided during repair of OASIS because they are haemostatic in nature and may cause ischaemia.

Good practice

- Any vaginal packs have been inserted they MUST be removed to avoid the complications of retained swabs.
- Use tailed swabs for vaginal packs and to attach a clip to the end of any swab inserted to make it less likely that it will be forgotten.
- Perform a rectal examination after the repair to ensure that sutures have not been inadvertently inserted through the anorectal mucosa. If a suture is identified, it should be removed.
- Reconcile needle and sponge counts, these should be recorded in the delivery notes.

Additional facilitator instructions

1. Ensure that each participant has adequate time to practice repair of the internal and external sphincters on the model.
2. At the end of the session ask participants to carefully remove their sutures ready for the next participants.
3. Remind all participants to dispose of their needles safely in the sharps box provided.

Note Poor needle discipline is a common problem in many settings, so do emphasise the importance of taking care with needles to avoid needle stick injuries.

Reference

Royal College of Obstetricians and Gynaecologists. (2015). The Management of Third and Fourth Degree Perineal Tears. Green-Top Guideline No. 29. Available at: https://www.rcog.org.uk/en/guidelines-research-services/guidelines/gtg29/

5.7 Fourth degree tear repair | Skill

Equipment

- Third/fourth degree trainer X6
- Needle holder, stitch scissors X6
- Toothed forceps X 6
- Allis forceps X12
- Langenbeck retractors X 12
- Small artery clips X 12
- Sutures X 6 (Vicryl 2.0)

Key learning objectives

- To learn how to repair a perineal tear that involves a tear in the anal/rectal mucosa
- To practice safe repair techniques

Instructions for the facilitator

Remind the students of the film they have been watching, including key messages from the lecture (basic anatomy, recognition of internal sphincter-smooth muscle (paler) and external sphincter-striated muscle (darker), both will retract when torn.

Demonstrate on the model how to identify torn anal/rectal mucosa. Explain that if the anal/rectal mucosa is torn at the level of the sphincter complex then it almost always means that both internal and external anal sphincters are also torn.

Discuss checking for button-hole lesions above the level of the anal sphincter complex. Use the index finger and a thumb in a pin-rolling technique to adequately examine the annual sphincter for damage.

Explain that ideally, third and fourth degree tears should be repaired in theatre with good lighting, analgesia/anaesthesia (spinal preferably), under aseptic conditions and with an assistant.

Remind them that informed consent must be obtained from the patient before the repair.

Demonstrate the following technique

Examine the tear carefully to identify the apex of the tear in the anal/rectal mucosa and place a suture over this.

Ask an assistant to hold the surrounding tissues back using the Langenbeck retractors.

Insert a suture 0.5 cms above the apex of the tear with the ends of the suture on the rectal side.

Depending upon the suture material used (3-0 or 4-0 polyglactin or catgut absorbable suture), the tear may be repaired with either continuous non-locked sutures (preferably) about 0.5 cms apart or interrupted sutures. If using interrupted sutures, ensure all knots are on the anal/rectal mucosa side.

Continue sutures to the point where the anal mucosa reaches the perineal skin and tie off.

During knot tying, remind participants about safe needle discipline. Turn the tip of the needle inwards in the needle holder so that the sharp tip is shielded by the needle holder and no-one can obtain a needle stick injury. THIS IS VERY IMPORTANT.

If time allows participants can continue to practice anal sphincter repair techniques.

Say that the rest of the repair would be conducted as for a third-degree tear.

Good practice:

Any vaginal packs have been inserted they MUST be removed to avoid the complications of retained swabs.

Use tailed swabs for vaginal packs and to attach a clip to the end of any swab inserted to make it less likely that it will be forgotten.

Reconcile needle and sponge counts, these should be recorded in the delivery notes.

Additional facilitator instructions

1. Ensure that each participant has adequate time to practice repair of anal/rectal mucosa on the model.
2. At the end of the session ask participants to carefully remove their sutures ready for the next participants.
3. Remind all participants to dispose of their needles safely in the sharps box provided.

Note Poor needle discipline is a common problem in many settings, so do emphasise the importance of taking care with needles to avoid needle stick injuries.

5.8 Postoperative care, follow up and counselling | Role play

Equipment

- ☐ Laminated Case studies
- ☐ Flip chart and pens

Learning objectives

- To review post-operative care following third and fourth degree tears
- To appreciate the importance of follow-up and counselling
- To practice listening and counselling techniques

Instructions for the facilitator

Ask participants to suggest important issues for post-operative care. Make sure that the following issues are covered:

1. Stool softening therapy (lactulose, not bulking agents)
2. Antibiotic prophylaxis (single dose)
3. Analgesia
4. Follow-up and advice for future deliveries

Case study

Ask for volunteers to role-play a patient and a doctor.

Background information for the class (to be provided out of earshot of those role playing the patient and the doctor).

A patient attends a midwife clinic for antenatal care at 16 weeks gestation. Upon questioning, she discloses that since the birth of her first child she has been embarrassed by being unable to control flatus. On a few occasions when she has had diarrhoea she has been incontinent of faeces but this is not usually a problem, although she always feels she has to rush to the toilet when she feels a need to open her bowels. She has not discussed this with any health professional previously because she thought it was just a change after giving birth that she had to accept. She had a spontaneous vaginal birth of a 3.9 kg baby last time. She recalled that she was pushing for what seemed to her to be a very long time, and the midwife was surprised when the baby emerged face up (face to pubis). She had sutures to her perineum after the birth but no-one mentioned anything specific about the anal sphincter.

Instructions for the patient

You are a woman aged 23 expecting your second child. You had a difficult labour last time and it seemed as if you were pushing the baby for a very long time. The midwife looked surprised at the delivery and she told you that the baby had come out face up. Your baby was big and weighed 3.9 kgs at birth.You had to have stitches after the birth and this was very painful. Since then you have been very embarrassed by finding that you cannot control the passage of wind from your back

passage. A few times when you had diarrhoea this leaked too. You always feel you need to rush to the toilet when you feel like opening your bowels. You have not spoken of this to anyone as you thought you just had to accept it and that somehow it is your fault. Please only disclose these facts in answers to specific questions. You have not really thought about how you would like to give birth to this next baby as yet.

Instructions for the doctor

A patient comes to see you in the antenatal clinic. She has been referred by a midwife because of issues of anal incontinence. The midwife would like you to counsel the patient regarding the best mode of delivery in the light of what the patient has told her. Please take a full history regarding the problem and discuss plans for delivery with the patient.

Notes for facilitator

Ensure principles of respectful care are applied.

Encourage participants to consider not just the physical effects of the clinical symptoms, but the probable effects on the woman's life, e.g. fear of going out, worry over sexual intercourse provoking leakage etc.

If necessary encourage the doctor to show the patient what OASIS involves by drawing a simple diagram.

Ensure that risks and benefits of repeat vaginal delivery versus caesarean are covered to enable the patient to make an informed choice.

Reference

Duggal, N. et al. (2008). Antibiotic prophylaxis for prevention of postpartum perineal wound complications: a randomised controlled trial. Obstetrics and Gynecology, 111(6), pp.1268-1273.

Surgical techniques breakout sessions 3: Post-surgical haemorrhage management

5.9 Recognising and managing post-caesarean haemorrhage | Scenario

Equipment

- ☐ BP Machine
- ☐ Stethoscope
- ☐ Pulse oximeter
- ☐ Oxygen face mask
- ☐ I.V. cannulae
- ☐ Giving set
- ☐ Syringe labelled oxytocin
- ☐ EWS chart

Key learning objectives

- To recognise and safely manage common post-operative complications
- To be aware of the need to return to theatre in cases of concealed haemorrhage

Instructions for the facilitator

The facilitator reads the scenario to the participants and then asks them to feedback the main points to ensure they have understood the scenario.

The facilitator asks for volunteers to play the role of the patient and a doctor.

The facilitator guides the discussion and ensures that the participants are supported to give the correct answers.

Scenario

A 24-year old primiparous patient is in the theatre recovery area, having been delivered by caesarean section under spinal anaesthesia 2 hours earlier because of a diagnosis of obstructed labour. The midwife has noticed that the patient is looking pale and has become drowsy, having previously been quite talkative but she has not taken any observations yet. She notices a doctor passing nearby and calls for help.

Facilitator: What would you do first?

Doctor: I would start with ABCDE assessment, check the airway, assess breathing, circulation and conscious level.

Facilitator: The patient has a patent airway. The respiratory rate is 38/minute but the chest is clear. The pulse is 120/minute and the BP is 85/55. The conscious level is V (responding to voice), giving a EWS score of 7. What is your diagnosis and What would you do?

Doctor: The patient is in shock. I would give oxygen, check that a wide-bore cannula was in place and if not insert one and give I.V. fluids (N.Saline or Ringer's lactate) rapidly at 1 litre in 20 minutes. I would insert a second wide-bore canula. I would call for help from a senior colleague.

Facilitator: What would you do next? What could be the possible causes of shock in this patient?

Doctor: I would undertake a secondary survey to look for possible causes. Possible causes include haemorrhage, sepsis or cardiac causes.

Facilitator: Which cause is most likely in this case?

Doctor: In this case hypovolaemic shock secondary to haemorrhage. The patient is pale and it is soon after surgery.

Facilitator: That's right. In most cases septic shock would take more time to develop and cardiac causes are less common. How would you look for haemorrhage?

Doctor: The haemorrhage might be revealed, concealed or both. I would look in the bed and perform abdominal and vaginal examinations.

Facilitator: The lochia seems normal and there are no clots in the vagina. The uterus is palpable at the level of the umbilicus and feels firm. There are no particular abdominal abnormalities detected, although the abdomen seems to be slightly distended. Do you still think this is hypovolaemic shock?

Doctor: There could be blood in the peritoneal cavity. I would also check the patient's temperature.

Facilitator: The midwife takes the vital signs again. The respiratory rate is 40/minute, the pulse is now 130/minute and the BP is 75/45. What is EWS score? What would you do now?

Doctor: The patient needs to go back to theatre urgently for a repeat laparotomy to locate the source of blood loss and stop the loss. I would send blood for urgent cross-match and call the theatre team. I would increase the rate of I.V. fluid infusion using both cannulae.

Facilitator: Good, that is the right thing to do. In this case an arterial bleed was located at the left uterine angle and 2.5 litres of blood was found within the peritoneal cavity.

Emphasise that failure to react to signs of shock and failure to return for repeat laparotomy in a timely fashion has been found to be a major cause of post-caesarean death in many locations.

Ask for suggestions as to why staff may be reluctant to return to theatre sometimes.

5.10 Condom catheter balloon (CCB) tamponade at caesarean section | Skill

Equipment

- ☐ Condoms
- ☐ Foley catheters
- ☐ Thread
- ☐ Scissors
- ☐ Intravenous giving set
- ☐ Fabric uterus with incision and cervix 1-2 cms dilated
- ☐ 500 mls IV fluid bag
- ☐ Bucket or basin
- ☐ Small safety pins

Key learning objectives

- To understand the role of the condom catheter balloon for prevention and control of PPH associated with placenta praevia and atonic uterus at caesarean section
- To practice making and inserting a condom catheter balloon
- The facilitator should discuss the use of balloon tamponade at caesarean section, then demonstrate how to put the CCB together and insert into the uterus

Instructions for the facilitator

The facilitator demonstrates how to set up a balloon tamponade using the following steps, then asks participants to do it themselves.

Discuss the need for additional analgesia as patients often feel more pain when a balloon is in situ, especially in the form of uterine cramps.

Discuss antibiotic prophylaxis and bladder catheterisation.

Steps

1. If possible apply initial haemostatic measures such as over-sewing bleeding areas of endometrium. In cases of placenta praevia this is not always possible as bleeding may be coming from multiple points in addition to coming from quite low down towards the cervix, where it can be both obscured by higher bleeding and difficult to reach.
2. Tie a condom to the Foley catheter, taking care to tie below the holes in the catheter tip, and about 1/3 to 1/2 way down the condom. (If ties are too near the end of the condom, the fluid filled balloon will tend to be too sausage shaped and is more likely to be expelled from the uterus, especially if the cervix has been dilated in labour prior to the caesarean). It is good practice to apply two ties.
3. Insert the prepared balloon into the uterus through the uterine incision.

4. Push the tail of the Foley catheter down through the cervix. In cases where no cervical dilation has occurred (for example, elective caesarean for placenta praevia) explain that there will be a need to gently dilate the cervix first. This can be achieved by gently pushing a finger down through the cervix from above.
5. Ask an assistant to reach into the vagina with a gloved hand to find the end of the Foley catheter and bring it down to the introitus, while you hold on to the top end to ensure it is retained in the uterus.
6. Once the Foley end is outside of the introitus, inflate the small balloon with 10 mls of fluid as you would when inserting a bladder catheter. This will ensure that the condom will not slip off the Foley catheter.
7. Next close the uterine incision as normal (In the demonstration safety pins can be utilized to mimic sutures).
8. Once the uterus is closed, the assistant is asked to start adding fluid to the Foley catheter from below. This is accomplished by connecting the end of the catheter to the giving set, which is attached to a bag of I.V fluid.
9. Run in some fluid whilst watching the suture line on the uterus. Ask the assistant to tell you if there is any vaginal loss. When the vaginal loss has settled the balloon will be sufficiently full to be applying adequate pressure to the bleeding areas to stop the loss.
10. Explain to participants that in cases of placenta praevia it is usual that 200-300 mls will be adequate. (In cases of atonic uterus, much more fluid is generally required).
11. Inspect the suture line carefully for any signs that the pressure of the balloon has caused the sutures to cut through the tissue. If so, extra sutures should be inserted. Provided the suture line is intact, the more superficial abdominal layers can be closed.
12. Explain that it is necessary to catheterise the bladder during the time that the CCB is in situ.
13. Explain that the CCB should remain in place for 12 -24 hours. This is generally sufficient time to allow for the bleeding vessels to seal off. When removing the CCB, drain 100 mls from the balloon. If there is no fresh bleeding the rest of the fluid can be drained immediately afterwards.
14. Deflate the small balloon in the Foley catheter then gently pull the CCB out via the vagina.
15. It is best to remove a CCB in the morning when more staff are available should any complications occur, rather than at night.

5.11 Venous access and cut-down | Skill

Equipment

- ☐ Whiteboard / flip chart + pens
- ☐ Scalpel no. 3 x 6(disposable scalpels with blades if available)
- ☐ Blades no. 10 or 15 x 6
- ☐ Mosquito artery forceps x 6 (or curved artery forceps)
- ☐ Artery forceps x 6
- ☐ Multipurpose suture material or linen thread/cotton x 1 roll and needles
- ☐ Intravenous canulae (e.g. Venflon™) 16-guage or 18-guage x 6
- ☐ Paper towels or tissue wipes
- ☐ Disposable surgical gloves
- ☐ Sharps box x 2
- ☐ Syringe labelled 'local anaesthetic'
- ☐ Cutdown pads x 6

Key learning objectives

- To learn safe cannulation techniques for internal jugular and femoral cannulation
- To learn the indications for cutdown
- To learn and practise venous cutdown

Instructions for the facilitator

Divide the session into a discussion about external jugular and femoral vein cannulation and venous cut-down skill practice.

The first part is a closed discussion led by the facilitator.

External jugular cannulation

Facilitator: What are the indications and contraindications of cannulating the external jugular vein?

Expected answers:

Indications:

- To be used in an emergency if there is difficulty obtaining venous access elsewhere.

Contraindications:

- Cervical spine trauma (unable to position neck adequately)
- Soft tissue trauma to the neck
- Patient has a neck mass
- Patient is unable to lie flat for the procedure
- Patient is agitated and moving head
- Infection at the site of insertion

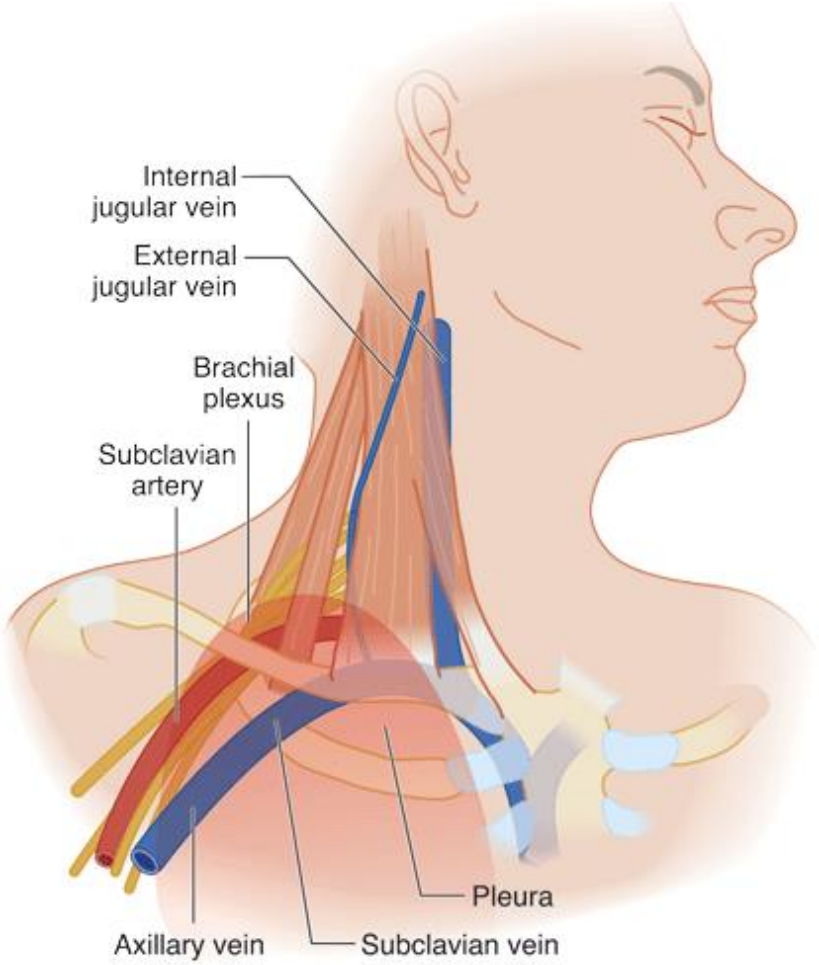

Figure 5.11.1: Location of the jugular vein

- Inability to identify anatomical landmarks for safe insertion
- Patient has a VP shunt on the side of intended insertion

Facilitator: Can both the left and right external jugular veins be cannulated?

Expected answer: Yes

Facilitator: How do you locate the external jugular vein?

Ask the participants to locate it on each other. The external jugular vein passes posteriorly over the sternomastoid muscle from the angle of the jaw and joins the subclavian vein behind the midpoint of the clavicle.

How to insert a cannula into the external jugular vein:

1. Gain consent from the patient (if the patient is conscious / has capacity to give consent).
2. Wash hands and put on non-sterile gloves.
3. Place the patient in the Trendelenburg position (supine and head down).
4. Turn the patient's head away from the side of the neck you intend to insert the cannula.
5. Clean the skin.

6. Lightly place a fore finger of your non-dominate hand just above the clavicle on the side you are going to cannulate (this will cause the vein to fill), and use the thumb of the same hand to apply traction to the skin.
7. Use the largest cannula you have available (e.g. 14G, 16G or 18G).
8. Puncture the vein midway between the angle of the jaw and the clavicle, and cannulate the vein in a shallow and superficial manner.
9. Confirm placement of the cannula, by witnessing a flashback of blood.
10. Flush the cannula with 0.9% normal saline.
11. Firmly secure the cannula with a cannula dressing.

Facilitator: Why is it important to place the patient in the Trendelenburg position before cannulating the external jugular vein?

Expected answers:

- It helps to distend the jugular vein so it's easier to locate.
- Helps to reduce the possibility of the patient obtaining an air embolism.

Facilitator: What are the complications associated with inserting a cannula into the external jugular vein?

Expected answers:

- Haematoma
- Infection
- Air embolism

Femoral vein cannulation

Facilitator: What are the indications and contraindications of cannulating the external jugular vein?

Expected answers:

Indications:

- To be used in an emergency if there is difficulty obtaining venous access elsewhere.

Contraindications:

- Patient is unable to lie flat for the procedure
- Patient is agitated and moving excessively
- Infection at the site of insertion
- Inability to identify anatomical landmarks for safe insertion
- Soft tissue swelling or trauma to the groin

Facilitator: What are the anatomical landmarks for locating the femoral vein for cannulation?

Use the whiteboard / flip chart and pens to draw the femoral triangle. As the facilitator, try to elicit the answers from the participants first.

Use the acronym: **NAVY** (**N**erve, **A**rtery, **V**ein, **Y**-fronts) to help the participants remember the correct order of the structures in the femoral triangle.

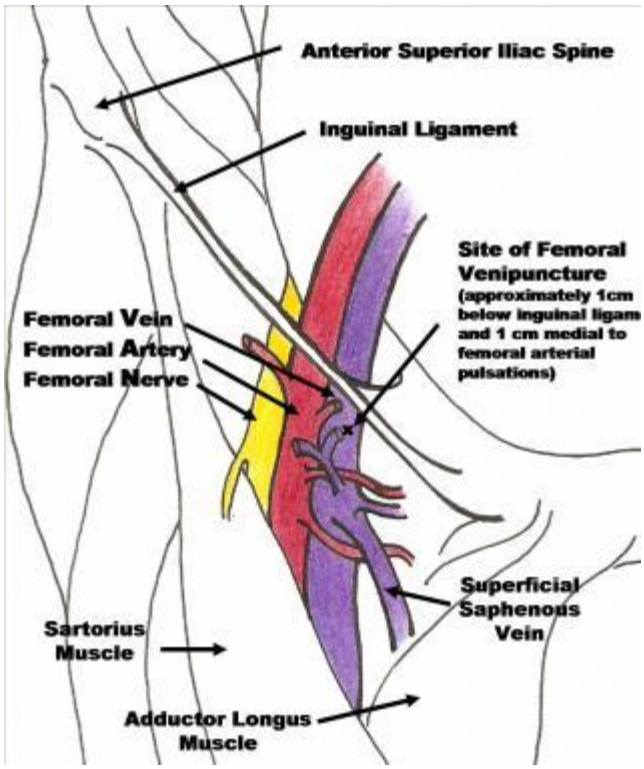

Figure 5.11.2: Anatomy of the femoral triangle

How to insert a cannula into the femoral vein

1. Gain consent from the patient (if the patient is conscious / has capacity to give consent).
2. Wash hands and put on non-sterile gloves.
3. Ensure the patient is supine.
4. Clean the skin.
5. Locate the femoral artery (it will be palpable as it's an artery), and aim approximately 1cm medially to the artery (towards the groin).
6. Use the largest cannula you have available (e.g. 14G, 16G or 18G).
7. Puncture the vein, at a 45-degree angle pointing the needle towards the patient's head (cephalic).
8. Confirm placement of the cannula, by witnessing a flashback of blood.
9. Flush the cannula with 0.9% normal saline.
10. Firmly secure the cannula with a cannula dressing.

Note The cannula will be prone to kinking if the patient doesn't remain supine – not advisable to cannulate the femoral vein if the patient is mobile in the bed

Facilitator: What are the complications associated with inserting a cannula into the femoral vein?

Expected answers:

- Haematoma
- Infection
- Accidental puncture of the femoral artery
- Nerve damage

Venous cutdown

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 (2 cm anterior to and 2 cm above the medial malleolus should be the site for cutdown).

The facilitator will demonstrate the skill with participants watching then all participants will perform the skill.

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

Technique

1. Apply a venous tourniquet proximal to the intended cannulation site.
2. Prepare the skin.
3. Infiltrate the area with local anaesthetic.
4. Make a full thickness transverse incision through the skin.
5. By blunt dissection, identify and display the vein.
6. Free the vein from its bed and elevate a 2-cm length.
7. Pass a double tie under the vein using an artery clip then cut the folded end of the tie.
8. Ligate the distal end, leaving the suture in place for traction.
9. Pass a tie around the proximal end of the vein.
10. Make a small transverse venotomy and gently dilate the opening with the tip of a closed haemostat.
11. Introduce the plastic cannula (without trocar) through the venotomy and secure it in place by tying the proximal ligature.
12. Attach the giving set and commence flow at the required rate.
13. 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).
14. Ensure all sharps are safely disposed of.

Emphasise 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 canulae

Note Technique may differ slightly in different settings and countries. The technique of intra-osseous infusion should be discussed as an alternative to venous cut-down, including a mention of the various possible sites of insertion (humeral head, proximal or distal tibia), contra-indications, need for analgesia with I.O. infusions and possible complications.

If time permits, ask participants to discuss the relative merits of external jugular or femoral vein cannulation versus cut-down or intra-osseous techniques.

5.12 Uterine compression sutures: skill

Equipment

- ☐ Fleece uterus with incision x 7
- ☐ Suture x 7
- ☐ Needle holder x 7
- ☐ Non-toothed forceps x 7
- ☐ Scissors x 7
- ☐ B-Lynch suture poster

Key learning objectives

- To understand the principles of uterine compression sutures
- To practice inserting sutures

Instructions for the facilitator

Facilitator will discuss the principles of the B-Lynch suture. If B-Lynch suture is to be used in combination with balloon tamponade then the balloon should be placed in the cavity of the uterus after the B-Lynch suture has been inserted, but prior to pulling tight and tying. Prior insertion of the B-Lynch suture prevents puncture of the condom catheter balloon with the needle. The balloon should then be inflated after uterine closure.

The facilitator will demonstrate B-Lynch suture insertion then assist all participants to insert a suture.

1. Explain the uterus must be exteriorised.
2. The uterine incision remains open (but suture angles of the incision first to reduce blood loss.
3. Insert suture from outside to inside of the uterus below the incision on the left side.
4. Bring suture from inside to outside above the incision line directly above the entry point.
5. Take suture up over left lateral side of uterine fundus.
6. Enter uterus from outside lower left posterior uterine surface.
7. Bring suture out of uterus lower right side.
8. Take suture up over right side of uterine fundus.
9. Enter uterus above suture line right side.
10. Bring suture from inside to outside below the incision directly below the entry point.
11. Close uterine incision.
12. Pull B-Lynch suture to cause uterus to contract.
13. Tie free ends of suture together.

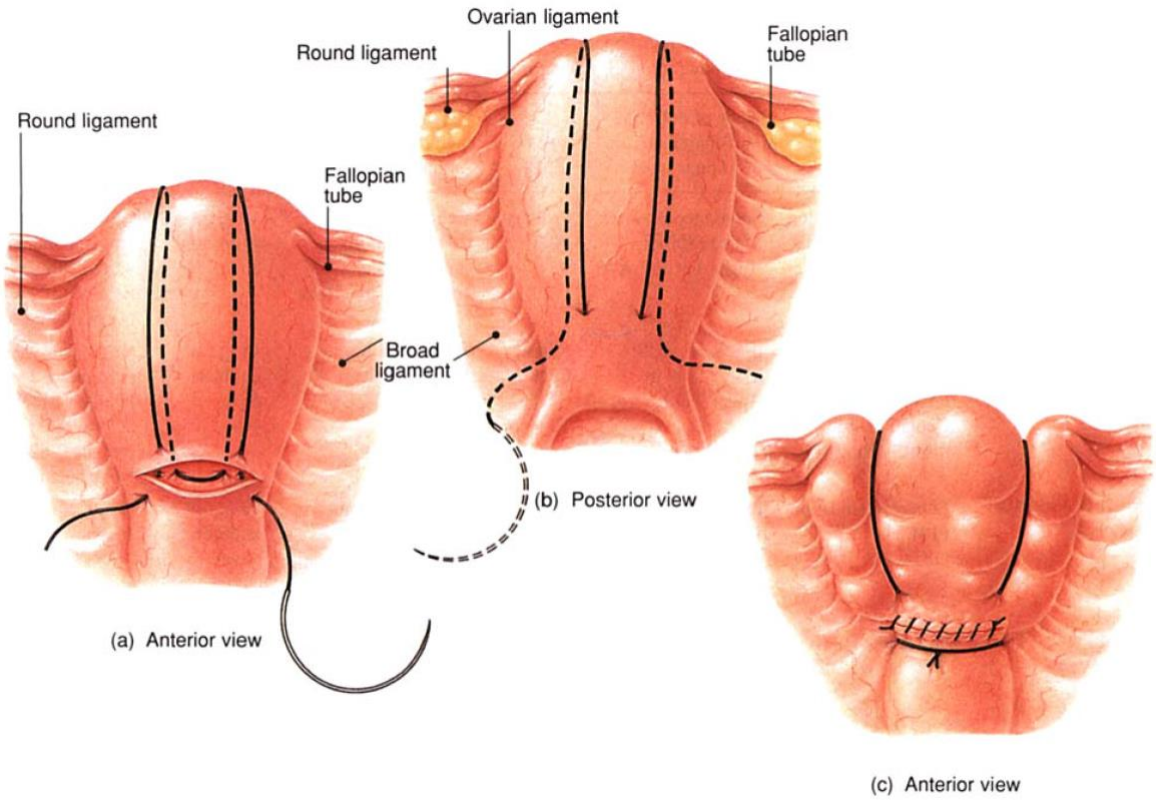

Figure 5.12.1: B-Lynch suture

Note If the uterus has not been opened due to a vaginal delivery but a compression suture is required, demonstrate the insertion of compression sutures in both upper and lower segments.

Reference

B-Lynch, C., Coker, A., Lawal, A.,Abu, J. and Cowen, M. (1997). The B-Lynch surgical technique for the control of massive postpartum haemorrhage: an alternative to hysterectomy? Five cases reported. BJOG, 104, pp.372-375.

Module 6: Module 6: Post-operative Care, Counselling and Clinical Audit

Post-operative care breakout sessions

6.1 Post-operative analgesia | Workshop

Equipment

- ☐ None

Key learning objectives

- Understand the causes of post-operative pain
- Know how to assess and treat post-operative pain
- Understand the concept of pre-emptive analgesia
- Understand the concept of multi-modal analgesia

Instructions for the facilitator

This is a closed discussion session led by the facilitator using the guidance below. There are two discussion topics followed by four scenarios.

Opening discussions:

1. Local practice
2. Why should we treat pain?

Scenario:

1. Pain assessment
2. Causes of post op-pain
3. Pain management – WHO ladder Vs WFSA ladder
4. Preventing pain

Local Practice

- Who prescribes post-op analgesia in your hospital?
- What analgesia do you routinely give to patients?
- What are the side effects of these drugs? – discuss side effects and need for monitoring (See Table 1).
- Are there any drugs you avoid using? Discuss contra-indications to NSAIDs, Paracetamol, Pethidine, Ketamine and tramadol (Table 6.1.1).
- Who assesses whether the patient is in pain?
- How do you assess pain in your hospital?
- Do you use opioid in spinal anaesthesia? What opioid and dose?
- Does the surgeon use local anaesthesia?

Table 6.1.1: Drug doses

Drug	IV bolus dose	PO/PR dose	IM dose	Side effects
Opioids				
Fentanyl	10-15 microg			**All opioids:** Respiratory depression, nausea, itching, drowsiness, constipation, confusion, accumulate in renal impairment. **Codeine:** Fast acetylators will convert to morphine and may have toxicity at lower doses. Avoid pethidine and tramadol in patients with epilepsy/on MAOIs
Morphine	2.5 – 5mg	10-20mg 2hrly PO	0.1-0.2mg/kg 4hrly	
Pethidine	25-50mg	50 -100mg 2hrly PO	25-100mg 4hrly	
Codeine	Do not give IV	30-60mg 6hrly PO		
Tramadol	50-100mg 6hrly	50-100mg 6hrly PO		
Paracetamol	1g 6hrly if > 50kg 15mg/kg if < 50kg	1g 6hrly if > 50kg 15mg/kg if < 50kg		Avoid in HELLP with severe liver derangement
NSAIDs				
Ibuprofen		200-400mg PO 8hrly		Gastritis, renal failure. Avoid in severe PET/renal failure/major haemorrhage
Diclofenac		25–50mg PO/PR 8hrly		
Adjuncts				
Clonidine	150 – 300mic over 5min (can be given 8hrly)			↓BP, ↓HR, sleepiness. Monitor BP and HR
Ketamine	0.125-0.5mg/kg			Delirium, hallucinations, ↑HR, ↑BP. Avoid in PET
Magnesium	50mg/kg slowly			↓BP, flushing. Caution in patients who have received high doses of Mg for PET. Avoid in shocked patients

Why should we treat pain?

- Patient comfort
- Improves mobility
- Reduces hospital stay
- Recovery and healing
- Morbidity associated with poorly controlled pain
- Ability to care for baby
- Chronic pain

Scenario

You are asked to see a 24-year old patient who underwent caesarean section under spinal overnight for fetal distress. She is now unable to get out of bed due to pain.

Facilitator: How will you assess the patient?

Expected answers:

- **ABCDE** approach!
    - the patient is stable.
- **A:** patent, talking, complaining of abdominal pain
- **B:** RR 20, shallow breathing (due to pain), SpO2 98% in air, chest clear
- **C:** HR 95, BP 128/70, Capillary refill time < 2sec
- **D:** Alert and talking, pain is 8/10. Sharp lower abdominal pain, worse on coughing and movement. (Pupils equal and reaching to light, glucose normal).
- **E:** T 36.5. Abdomen soft, uterus well contracted, tender to touch and she doesn't want you to palpate. Normal lochia. Has passed urine. Bowels not yet opened but passing flatus.

Facilitator: How can we assess this patient's pain?

History

Consider what is causing the pain, diagnostic clues:

- Site
- Character
- Severity
- Duration
- What makes it better or worse?

What analgesia has she had?

- Fentanyl in spinal - Short acting, will require opioid analgesia in post-operative period.
- Had 500mg paracetamol at 8am
- Didn't receive NSAID as has asthma

Severity (Pain Scales):

- 0-10
- 0 – 3 (where 0 = no pain, 1 = mild pain, 2 = moderate pain, 3 = worst pain imaginable)

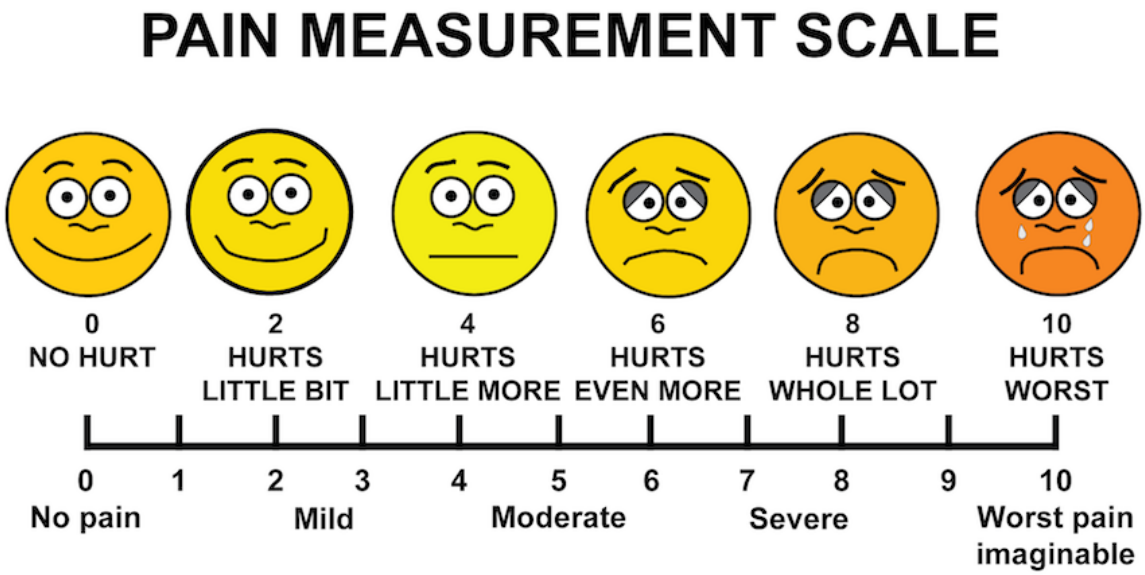

Figure 6.1.1: A pain measurement scale

Facilitator: What are the possible causes of her pain? (Ask candidates for differential with most likely causes)

- Surgical wound – most likely in this case
- Urinary retention
- Constipation/ileus/flatus – associated abdominal distension, may be colicky
- Uterine contractions – worse when breastfeeding
- Intraperitoneal haemorrhage – signs of peritonism, may be tachypnoea, tachycardia, hypotension
- Infection – examine wound and lochia, check temperature, may be tachycardic. Think SEPSIS!

Treat the cause AND the pain

Facilitator: How will you manage this woman's pain?

Patient is Day 1 post-op

Likely to require:

- Paracetamol 1g (if > 50kg; if < 50kg -> 15-20mg/kg)
- NSAID (discuss Asthma and NSAIDs – NOT a contra-indication unless have had adverse reaction)
- Strong opioid analgesia by injection (IV/IM)
- Support and reassurance – help to lift her baby
- Prescribe laxatives with opioid analgesia

Facilitator: How will you monitor the patient?

- Monitor RR and SpO2 if strong opioids used
- Monitor pain score – reassess
- Also monitor the baby – small amounts of opioid excreted in breastmilk can cause sleepiness

Facilitator: Discuss the WHO analgesic ladder vs WFSA pain ladder

- WFSA pain ladder: Pre-emptive analgesia for post-op patients
- WFSA pain ladder: Step *down* analgesia as patient recovers
- WHO ladder: If pain is not controlled, can step up requirements

Severe pain (Day 1)

Strong opioids		
By injection:		
Morphine	**Moderate pain (Day 2-3)**	
Pethidine	**Weak opioids**	
Fentanyl	By mouth:	
Local Anaesthetic	Codeine	**Mild pain (Day 3-7)**
Regular Paracetamol	Tramadol	**Regular Paracetamol**
Regular NSAIDs*	Regular Paracetamol	As required NSAIDs*
+/- Adjuncts	Regular NSAIDs*	

Figure 6.1.2: Post-op analgesia ladder (adapted from WFSA pain ladder)
(NSAIDs = non-steroidal anti-inflammatory drugs, eg diclofenac; Adjuncts include clonidine, ketamine)

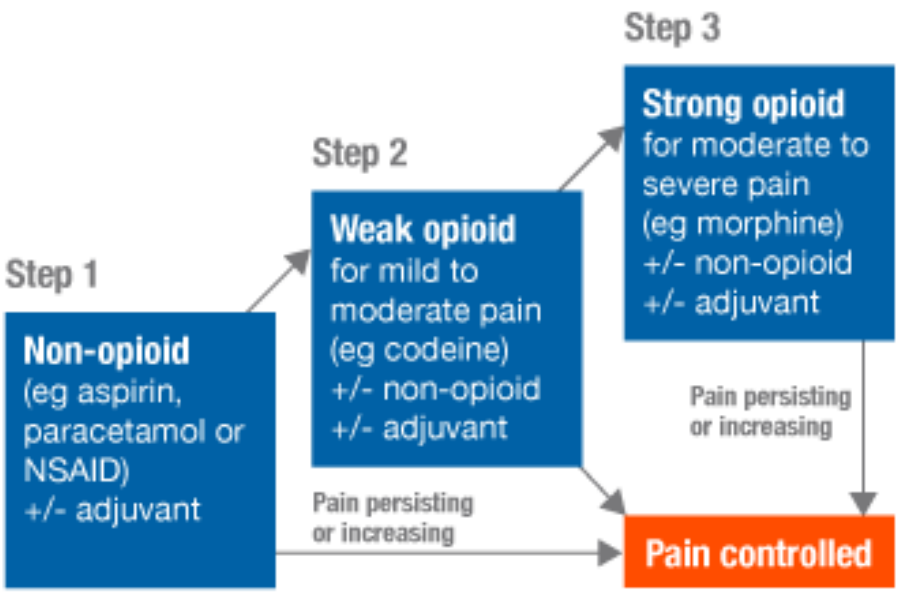

Figure 6.1.3: WHO analgesia ladder

Facilitator: Can we prevent pain?

- Yes!
- Preventing pain is easier than treating pain when it is established

Facilitator: What methods are there for preventing post-operative pain?

Surgical:

- Pfannenstiel incision is less painful than midline
- Local anaesthetic infiltration of wound
- Local anaesthetic TAP block
- Maximum doses of LA:
    - Lidocaine with adrenaline: 7mg/kg
    - Lidocaine without adrenaline: 3mg/kg
    - Bupivacaine (with or without adrenaline): 2mg/kg

Anaesthetic:

- Opioid in spinal: long acting opioids (preservative free morphine/diamorphine)
- Fentanyl is short acting
- IV morphine in case of GA – titrate slowly and ensure patient remains self-ventilating
- IV/PR paracetamol
- PR diclofenac
- Ketamine has analgesic properties
- Diazepam does NOT provide analgesia

Post-op analgesia:

- As per WFSA pain ladder
- Review requirements and step down as able
- If pain is increasing post-operatively, increase analgesia as per ladder and consider the cause. Pain should improve post-operatively.

Facilitator: What is pre-emptive analgesia?

- Providing analgesia **before** pain develops
- Surgery is painful
- Analgesia requirements are highest immediately post-operatively

Analgesic adjuncts (may be used for refractory pain; are opioid sparing):

Facilitator: Discuss doses and side effects (See Table 6.1.1).

- Clonidine
- Magnesium
- Ketamine

Facilitator: What is multi-modal analgesia?

- Using multiple agents with different mechanisms of action to prevent and treat pain
- Local anaesthetic and systemic drugs
- Different classes of systemic agents
- Improved analgesia and reduced opioid requirements

Opioid Reminders

- Avoid opioids for 24hours in patients who have had morphine/diamorphine in spinal.
- All patients receiving strong opioids (fentanyl/morphine/pethidine/diamorphine) need their RR and SpO2 monitored.
- Opioid-induced respiratory depression (RR <8 or desaturation) -> Naloxone 100-200microg IV followed by 100microg IM every 1-2hrs if persistent depression.
- Opioids cause constipation: Prescribe laxatives.

Table 6.1.2: Intra-thecal opioid doses

Opioid Analgesics		
Fentanyl	10-25 micrograms (0.2 – 0.5ml of 50 mic/ml)	1-4 hours
Diamorphine	0.3mg (0.3ml of 5mg/5ml)	12 hours
Preservative free morphine	0.1mg (0.1ml of 10mg/10ml)	24 hours

Summary

- Prevent pain with multi-modal pre-emptive analgesia.
- Assess post-operative pain routinely.
- Treat the pain AND the cause.
- Monitor RR and SpO2 in patients when strong opioid analgesia is used.

6.2 Post-operative care case scenarios | Scenarios

Equipment

- ☐ BP cuff
- ☐ Stethoscope
- ☐ Thermometer
- ☐ Oxygen mask
- ☐ I.V cannula
- ☐ Giving set
- ☐ NG tube
- ☐ Thermometer
- ☐ I.V. fluids
- ☐ Syringes labelled with antibiotics
- ☐ MEOWS chart

Key learning objectives

- To consider differential diagnoses for patients with post-operative complications
- To apply ABCDE in post-operative care
- To provide safe management for patients with post-operative complications
- To appreciate the risks of post-surgical sepsis
- To apply a structured approach to the management of a sick patient on the postnatal ward

Instructions for the facilitator

The facilitator reads the first scenario to the participants then asks them to feedback the main points to ensure they have understood the scenario.

The facilitator asks for volunteers to play the role of the patient and a doctor.

If time allows, go through the second scenario in the same way.

Case 1: Paralytic ileus (do not tell this to the participants at this stage, see if they can work it out)

Scenario

A 30-year old patient had a caesarean section under general anaesthesia 24 hours earlier for failure to progress in the second stage, following a prolonged labour. An attempt at spinal anaesthesia had failed. As laparotomy, it was discovered that the lower segment was very thin and on the point of rupture, and there were extensions of the uterine incision bilaterally, necessitating exteriorization of the uterus for repair. Blood loss was estimated as 1500 mls. The patient is on the postnatal ward. She is complaining of severe abdominal pain and vomiting.

Facilitator: You have been called by the midwife to review this patient who is complaining of severe abdominal pain and vomiting 24 hours following a caesarean section. What will you do?

Doctor: I would start by greeting the patient, then I would assess the patient by a primary survey, using ABCDE.

Facilitator: That's good. You find that the patient has a patent airway, a respiratory rate of 30/minute, Pulse of 105/minute and BP of 120/75. The conscious level is Alert. Is this OK?

Doctor: No both the pulse and respiratory rate are high.

Facilitator: What would you do?

Doctor: I would treat the rapid respirations with oxygen and insert an I.V. line if one was not already there, and commence an infusion of normal saline or ringer's lactate.

Facilitator: What would you do next?

Doctor: I would perform a secondary survey, including a head to toe examination to look for a cause for the problem. I would want to know if the patient had a raised temperature and what the EWS score was?

Facilitator: The temperature is 37.9°C and the EWS score is 4. What might be the cause of this? Remember the patient is complaining of severe pain and has been vomiting.

Doctor: I would consider giving intravenous antibiotics and I would want to examine the patient's abdomen.

Facilitator: How would you do that?

Doctor: I would start with inspection.

Facilitator: The abdomen looks more distended than might be expected. What would you do next?

Doctor: I would auscultate for bowel sounds and palpate for signs of peritonism.

Facilitator: Bowel sounds are not heard and there is diffuse tenderness. What could be the problem?

Participant: The patient could be suffering from paralytic ileus.

Facilitator (to all participants): How should this be managed? What complications could develop?

Discuss paralytic ileus and its management. Consider Ogilvy's Syndrome and the risks of bowel necrosis or perforation. How is pseudo-obstruction differentiated from genuine bowel obstruction?

Case 2: Sepsis

Scenario

A patient on the postnatal ward reports feeling unwell and short of breath. She complains of chest tightness and feeling hot and cold.

She had a caesarean section two days ago under general anaesthesia for prolonged labour with failure to progress.

The midwife has asked the doctor to review the patient.

Facilitator: How would you assess this patient?

Doctor: I would start by performing a primary survey using the ABCDE approach.

Facilitator: The patient is alert. She has a respiratory rate of 38/minute and looks obviously breathless. Her pulse is 105/minute and BP is 120/70. Is this OK?

Doctor: No. The respiratory rate is very high and the pulse is high.

Facilitator: Is there anything else would you like to know?

Doctor: I would like to know the temperature of the patient.

Facilitator: The temperature is 38.9°C. What is the EWS score? What would you do?

Doctor: It is likely that the cause of the problem is sepsis. I need to treat the patient with oxygen, commence I.V. fluids and give broad spectrum antibiotics and antipyretics. I would undertake a secondary survey to look for the source of the sepsis.

Facilitator: Please show me how you would do the secondary survey. What are you suspecting?

Doctor: I would perform a head to toe survey. I would want to listen carefully to the patient's chest to determine whether the rapid breathing is due to a primary lung problem or is secondary to another source of sepsis.

Facilitator: On auscultation you hear crackles and rhonchi and an area of diminished air entry at the left base. The chest is dull to percussion at the left base, with bronchial breathing. What could this mean? What does the patient need?

Participant: The patient may have pneumonia. They will need treatment with broad spectrum antibiotics, oxygen and fluids.

Facilitator: How should the patient be monitored?

Doctor: With a EWS chart. This will help to show if the condition is improving in response to the treatment.

Discuss with participants the differential diagnosis. In particular, ask participants to suggest what the diagnosis could have been in the absence of pyrexia (asthma, cardiac conditions, pulmonary embolism). How would these conditions have been treated?

Explain that two days later, the patient still has a fluctuating fever. What should be done? (Expect the participants to say ABCDE again). Tell them that on examination the caesarean wound is found to be swollen, hard and very tender. Pus is oozing from one area of the wound. Discuss how this should be managed.

6.3 Counselling for future deliveries | Role play

Equipment

- ☐ Whiteboard / flip chart and pens

Key learning objectives

- To gain listening and counselling skills
- To apply the principles of respectful care in a counselling situation
- To become proficient in counselling patients after caesarean regarding planning future deliveries

Instructions for the facilitator

The facilitator will explain that participants will practice counselling in pairs. Two participants will role play a scenario observed by the other participants. This will be followed by a discussion.

The facilitator will ensure that the group focuses on counselling technique and factual accuracy of the advice given using the check list below.

Case studies

1. A woman has just had her 5th caesarean section. The procedure was complicated by a placenta praevia and she lost 2 litres of blood. The lower segment of the uterus was very thin. She now has three living children, all girls. She and her husband are keen that they continue to try for a son.

   How would you counsel this patient?

2. A woman has had a caesarean section for the delivery of her first child because of fetal distress. Her baby required extensive resuscitation and was admitted to the Neonatal Intensive Care Unit because of convulsions, although seems to have made a good recovery. The woman is very upset that her baby experienced complications and she is very keen to be delivered by caesarean in the future. However, fetal distress is not a recurring indication for caesarean section.

   How would you counsel this patient?

3. A Woman has had a caesarean section for the second time. The indication for the first caesarean was fetal distress and the second breech presentation. She has found recovery difficult and painful on both occasions and would like to aim for a vaginal delivery next time around.

   How would you counsel this patient?

4. A woman had an assisted vaginal delivery for her first birth complicated by a third-degree tear. Six weeks later she is complaining of incontinence of flatus and noticed soiling when she has diarrhoea in the first post-operative week, but generally her bowel control is good. She has come to the post-natal clinic for advice regarding future deliveries.

   How would you counsel this patient?

Check list for counselling following caesarean section

1. Check that the patient has understood the reason for the caesarean section correctly and confirm explanation.
2. Explore the patient's ideas and preferences for future deliveries.
3. Ask how many more pregnancies she is planning.
4. Check whether there are any absolute contra-indications to future vaginal births e.g. classical scar*.
5. Check if the patient has any factors associated with a greater likelihood of successful vaginal birth*.
6. Check if the patient has any factors associated with a decreased likelihood of successful vaginal birth*.
7. Outline future options; planned caesarean section, trial of scar, trial of scar if spontaneous labour before a certain gestation etc.
8. Explain the risks and benefits of the various options.

* See Participants' Manual Chapter 6.3

6.4 Neonatal resuscitation following operative delivery | Skill

Equipment

- ☐ Resusi baby
- ☐ Hat
- ☐ Neonatal Ambu bag (with release valve)
- ☐ Masks for Ambu bag (2 sizes: 0 and 1)
- ☐ Stethoscope
- ☐ Towels (3, includes two for the baby and one for a shoulder roll))
- ☐ Penguin sucker

Key learning objectives

- To revise the steps taken to resuscitate a newborn baby
- To appreciate the particular issues likely to arise when resuscitating and caring for babies delivered by caesarean section

Instructions for the facilitator

Demonstrate to the participants what should be done to resuscitate this baby. Following the demonstration all participants should practice the essential skills of bag and mask ventilation and cardiac compressions.

Say that the equipment should have been checked prior to the resuscitation and the member of staff should have washed their hands and applied clean gloves.

Allow plenty of time for participants to practice the skill.

Start by telling the participants the scenario below.

Scenario

Imagine that you have been called to receive a full-term baby at caesarean section. The indication for the caesarean was a cord prolapse at 5 cms dilation. A fetal heart rate of 80/minute had been auscultated on the theatre table immediately prior to opening the maternal abdomen. At delivery the baby looks pale and is floppy and no sign of breathing. The surgeon passes the baby to you, having noted the condition of the baby and having cut the umbilical cord.

Within the first minute:

- Call for help.
- Place the baby supine on a firm flat clean surface preferably under a radiant warmer.
- Dry and stimulate the baby (drying provides sufficient stimulation in itself).
- Discard wet towel.
- Cover with a dry towel, leaving chest visible.
- Put a hat on the baby. Emphasise the great importance of keeping the baby warm.

- Is the baby breathing?
    - If not, open airway by placing a shoulder roll under the shoulders, tilting the head back with a head tilt and chin lift to the neutral position, and performing very brief gentle suction of air passages with penguin under direct vision only if there are obvious secretions present.
- Is the baby breathing?
    - If not breathing once the airway is open, apply mask and commence ventilation with the Ambu bag at the rate of 40 breaths per minute.

Note Ventilation, if required, should be commenced within the first minute (the golden minute).

Demonstrate carefully the choice of an appropriately sized mask and the application of the mask to the baby's face to avoid leakage of air. Hold the mask with thumb and forefinger and lift the chin with your middle finger. Be careful not to occlude the baby's trachea with your other fingers.

If using an Ambu bag with an escape valve (which most have) then you do not need to worry about how hard to squeeze the bag as you cannot over-inflate the lungs. (You can tell if your Ambu bag has such a valve by placing the mask on your own palm and squeezing the bag hard. As the valve releases you will hear a clicking sound). If there is no valve, squeeze the bag gently to inflate the lungs to avoid causing a pneumothorax.

- If the chest doesn't move after a few breaths, reposition the baby and re-apply the bag and mask.
    - It may take a few breaths to get the chest to move as fluid is being pushed out from the lungs into the interstitial tissues. However, if the chest is not moving ultimately the lungs are not being inflated. The most likely reason for this is that the airway is not being held open or the mask is badly positioned and leakage is occurring. Remember that the baby's head needs to be held in the neutral position, tilted back enough to maintain an open airway by lifting the tongue away from the airway, but not so far back that the soft neonatal trachea is compressed.
- If there is still no chest movement check again for any upper airway obstruction and using the penguin sucker, remove it under direct vision.
    - Suction without vision should be avoided as damage may occur to the throat resulting in either airway obstruction due to trauma or spasm or vagal stimulation resulting in bradycardia.
- After one minute of effective ventilation, check the baby's heart rate by listening to the left side of the chest with a stethoscope. If no stethoscope is available palpate the brachial pulse.
- If the heart rate is less than 100/minute but more than 60/minute, continue to ventilate and check again after 30 seconds.
- If the heart rate is less than 60/minute you ask your helper to perform cardiac massage. (Emphasise that this is only rarely necessary).
    - This is done by placing two hands in a ring around the baby's chest with the thumbs overlapping on the sternum in the inter-nipple line. The chest should be compressed three times (at a rate of 120/minute) and then you should give one ventilation.

- Continue with 3 compressions to 1 ventilation ratio for 30 seconds then check the heart rate again. The depth of compression should be equivalent to 1/3 of the total depth of the baby's chest
- An alternative method of performing cardiac compressions, and one that should be employed when single-handed, is to compress the sternum in the same place with two finger-tips using the hand that squeezes the Ambu bag.
- Do not remove or let go of the mask on the baby's face during Cardio pulmonary resuscitation, continue to hold it in place with the head maintained in the neutral position and continue to watch for chest rise during ventilation.
- Once the baby's heart rate is above 60/minute and rising you should stop compressions.
- Continue to ventilate until the baby shows signs of regular breathing or crying.
- If there is no sign of breathing at all and no heart rate after ten minutes of good quality resuscitation then you should stop. In this case the baby is not going to recover. Explain to the patients sympathetically that the baby cannot survive and provide support and comfort.
- If there is a heart rate <60/minute but no spontaneous breathing by 20 minutes, attempts at resuscitation should also cease as it is very likely that the respiratory centre in the brain stem has been damaged beyond recovery.
- You should stop ventilation once the baby starts to breathe regularly. Wrap and give to the mother but continue to observe frequently.

Discuss the issue of transient tachypnoea of the newborn (TTN) with participants. This is a particular problem following delivery by caesarean section, especially if the membranes have been intact until the point of birth. Explain that a baby with TTN will show signs of respiratory distress manifest by nasal flaring, intercostal recession, grunting and rapid breathing. If this does not settle the baby will need supplemental oxygen and/or CPAP until the lungs have dried out. Explain to the mother that this is a temporary situation that does not result in any long-term consequences.

Note Normally neonatal Ambu bag ventilation is performed using ambient air and supplemental oxygen is not necessary. Remember air contains 21% oxygen. However, when performing CPR supplemental oxygen (100%) may be used, if available, but should be discontinued as soon as the heart rate recovers.

Emphasise that improvements in neonatal heart rate are the most sensitive indicator of success of each intervention.

Emphasise that ALL staff involved in caesarean section should be proficient in neonatal resuscitation.

References

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Clinical audit breakout sessions

6.5 Documentation following caesarean section | Workshop

Equipment

- ☐ Whiteboard / flip chart + pens

Key learning objectives

- To understand the importance of clear post-operative documentation
- To consider the components of that documentation

Instructions for the facilitator

Ask participants how they record surgical details. Do they have a proforma?

If so what details does it ask for?

Where are the records kept?

What information is given to the patient regarding the operation?

Ask them what details they think are important to record?

Design a caesarean proforma with participants to include:

- Patient's details: name, Date of Birth, patient identifying number
- Title of operation
- Reason for the procedure
- Gravidity and parity, number of previous caesareans
- Procedure

Procedure to include:

- Abdominal incision
  - Type of incision
- Peritoneum and bladder
  - Any excision of previous scar?
  - Ease of access into peritoneal cavity, any problems encountered e.g. adhesions to the underside of the rectus sheath. Blunt or sharp dissection?
  - Any intra-peritoneal adhesions and division
  - Any problem dissecting bladder from lower segment of uterus

- Uterine incision
    - Was uterine incision transverse lower segment, vertical lower segment or classical (vertical extending higher than lower segment)?
    - State of lower segment: Thick, normal, thin, very thin (see-through)
    - Whether lower segment opened higher than usual
    - Whether incision extended, if so how?
    - Means of opening uterus: Knife, scissors, fingers
- Delivery of baby
    - Lie of baby immediately prior to delivery
    - Condition of liquor
    - Engagement or not of presenting part
    - Any difficulties encountered with delivery of baby
    - Any trauma to the baby
- Placentation
    - Location of placenta within uterus
    - Did placenta separate spontaneously?
    - Any problem with placental separation?
    - Confirm cavity checked to ensure empty
    - Is cavity normal or septate/ bicornuate?
    - Any problems with placental bed: excessive bleeding
    - Any additional measures e.g. insertion of compression balloon into cavity
- Closure
    - Closure of the uterus: suture type used, how many layers?
    - Any additional haemostatic sutures required?
    - Tubes and ovaries: any abnormalities
    - Any additional procedures e.g. ovarian cystectomy, bi-lateral tubal ligation
    - Closure of visceral peritoneum yes/no
    - Closure of parietal peritoneum yes/no
    - Haemostasis under rectus sheath ensured
    - Rectus sheath closure: suture type
    - Scarpa's fascia closure: yes/no
    - Skin closure: method, (clips or suture) Suture type and method e.g. subcuticular, interrupted, continuous
- Additional notes
    - Estimated blood loss
    - Recommendations for next delivery e.g. planned caesarean, trial of labour, advice against pregnancy. (Not applicable if bi-lateral tubal ligation performed).
    - Any additional instructions for post-operative care if procedure complicated e.g. prolonged catheterisation if bladder injured.

Discuss with participants why it is important to document all of the above. Emphasise the importance of a review of previous surgical records before performing a repeat caesarean section.

6.6 Standards based audit | Workshop

Equipment

- ☐ Whiteboard / flip chart + pens

Key learning objectives

- To appreciate the value of standards-based audit
- To understand the audit cycle
- To plan an audit proforma

Instructions for the facilitator

Discuss the concept of standards-based audit with participants.

Explain that audit is a means of checking the extent to which best practice is put in place.

Explain the audit cycle and the importance of completing the cycle. Link audit to action planning.

Ask the participants to consider audits that they could undertake on the following topics. Some suggestions are included to encourage discussion but the participants should be encouraged to come up with their own suggestions.

3rd/4th degree tears

- The incidence of 3rd/4th degree tears for AVD and normal births?
- Whether women are experiencing problems after repair?
- The quality of documentation of tears and repair?

Caesarean section

- Decision making according to agreed criteria?
- Numbers of sections according to Robson classification?
- Proportion of referred patients with caesarean deliveries compared to direct admissions?

Assisted vaginal delivery

- Decision making according to agreed criteria?
- Conducted in operating theatre if OT or OP position?
- Consent for procedure documented?

Operating theatre

- Left lateral tilt of the table?
- WHO safe surgical checklist used at correct times and filled in correctly?
- Documentation of swab counts?

Haemorrhage

- Was the major haemorrhage guideline followed?

Infection control

- Incidence of wound infections requiring surgical drainage?
- Prophylactic antibiotics administered prior to surgery?

Neonatal care

- Kangaroo care for stable pre-term babies
- Breast feeding initiated in first hour of life

Anaesthesia

- Incidence of post-spinal anaesthesia complications, e.g. headache
- Proportion of caesarean sections under GA versus regional (spinal) anaesthesia
- Quality of preoperative assessment
- Intraoperative pain perception

Ask the participants to choose a topic for an audit and work in pairs to design an audit proforma to collect data for their audit.

Encourage participants to reflect on the value of audit in delivering quality care for patients.

6.7 Maternal death surveillance and response (MDSR) | Workshop

Equipment

- ☐ Copies of case review forms X 7
- ☐ Whiteboard / flipchart + pens

Key learning objectives

- To practice performing a death review
- To appreciate how findings from death review lead to recommendations to improve practice

Instructions for the facilitator

In this session the participants will be guided to review a case of maternal death following a caesarean section.

Invite the participants to read through the case for five minutes then lead a discussion on the following, writing main points on the whiteboard / flip chart:

- Risk factors identified from the history
  Suggested answers: Grand-multiparous patient, previous PPH
- Any areas of good practice
  Suggested answers: Four antenatal visits, took anti-malarial prophylaxis and iron supplementation
- Areas where they think things should have been done differently
  Suggested answers:
  - Should not have augmented with oxytocin (grand-multipara and progressing in labour)
  - If progressing in second stage should have allowed to deliver with face presentation (if mento-anterior, not mentioned)
  - Second stage of five hours prior to going to theatre, too long
  - Lack of preparation
  - Lack of observations
  - Should not have left theatre until bleeding under control
  - Probably cut bladder by making incision low, questionable quality of surgery
  - Insufficient transfusion
- Areas where if things had been done differently the outcome might have been avoided
- Suggested answers: As above
- Recommendations for change
- Comment on any further information that would make review better

Example

The following case is a real case from a Maternal Death Surveillance and Response process undertaken in Uganda involving the death of a woman following caesarean section (HURAPRIM Project).

Case Review Form

Summary of the case (therapeutic itinerary and management of the patient):

a. Background

The deceased was a 28 year-old female, of S.4 level of education and a snacks seller by occupation. She was living with her husband and sister-in-law.

She was the first wife and a grand multi para with 4 existing children. The pregnancy was for the fifth born and the baby survived. She had attended ANC 3 times from a private hospital where she also wished to deliver from as with the previous pregnancies. The private hospital is the nearest health facility to their home with an approximate distance of 3km in between.

She did not have any problems with her previous pregnancies or deliveries, had never had any still births, abortions or miscarriages. (Apart from a history of heavy bleeding tendencies with her previous deliveries). She had tested negative for HIV and had no problems at all with this particular pregnancy, she was immunized and received pregnancy prophylaxis medication like antimalarials, iron supplements, had a good appetite, was generally in good condition with no chronic/persistent medical problems.

Her blood pressure was normal; she was not stressed at the moment, had no physical injuries like falls / beatings, and did not consult anyone else during the pregnancy apart from the ANC. Her EDD was 20th/09/12 and she expected to deliver normally like before since she had been successful with the other pregnancies from the same hospital. She had gone for antenatal services when she was admitted from there and told not to go back home by the health workers, that she was due for delivery.

b. First signs of illness, and actions taken

There were no signs of illness, apart from slight labour like pains.

She had gone for her 4th ANC services as usual from the private hospital on 10/09/12 at 9:00am when she was told to stay and be admitted for delivery. She stayed at the hospital as the sister in law went back home to bring her delivery necessities and admission was done at 1:30pm by a midwife and doctor.

c. Management in the Community

The mother did not go to any clinic or see any traditional healer.

d. Management in the hospital

At the hospital, she presented with slight labour pains on her 4th ANC visit, she was admitted and reviewed at 5:15pm 10th/09/2012 and the findings were;

Findings	Care plan
Membranes intact 4cm dilated Foetal heart was 138bts/min 4/5 parts were palpable Fundal Height was 40/40 weeks Temp was 36˚C BP was 110/80mmHg And the Presentation was Cephalic.	Encourage bladder emptying. She was told to ambulate Take sweetened tea

When reviewed again on 11/09/12 at 1:20am, the fetal heart rate was still 138 bts/min, membranes were still intact and BP was still 110/80mmHg. Partograph was not fully filled, and the patient was not reviewed again until 2pm on 11/9/12.

At 2:00pm of 11th/09/12, the membranes were still intact, she was 7cm dilated with a BP of 110/80mmHg and the care plan was to augment with 5IU oxytocin.

At 3:30pm, Membranes ruptured with clear liquor, Foetal heart rate was 136bts/min, and a VE was done to exclude cord prolapse, No cord was felt and the presenting part was still high with the OS fully dilated.

At 3:56pm, she was reviewed by a doctor and midwife VE was repeated and felt like face presentation. Contractions had stopped despite IV Oxytocin.

The Oxytocin was stopped and replaced with IV Normal Saline. A urinary catheter was passed too.

Labour pains increased after 8 hours of medication and she had started pushing the baby but was stopped because the baby was coming out by face presentation.

The sister in law says the midwife saw the baby coming and pushed it back in so as to let her deliver by caesarean section; that they prefer C/S because they gain more money from it than the usual normal deliveries. The midwife refused to comment about the pushing back of the baby.

She was taken to theatre at 8:30pm and done caesarean section through the lower segment incision where the abdomen was opened in layers & found the catheter balloon in the abdomen with a ruptured anterior bladder wall.

The baby was born without any complication and was in a good condition with APGAR score, 9/10 but the mother had a complication of profuse bleeding after the operation. The uterus was repaired in 2 layers with extreme difficulty as it was hard to contract. The bladder wall was also repaired with vicryl 2/0.

The mother was sent to the ward with:

- IV N/S 4 litres in 6hrs
- IV Blood (whole 4 units & frozen plasma)
- IV metronidazole 500mg tds×3/7
- IV gentamicin 160g od×3/7
- IV ceftriaxone 2g od×3/7
- Rectal misoprostol 5 tabs stat
- Rectal diclofenac 100mg stat

The mother was still bleeding a lot so was returned to theatre for the second time at 10:20pm to control the bleeding. While in theatre, a very large non-contracted uterus was found with bleeding almost everywhere, they did subtotal hysterectomy, left ovary in site repaired, tried to arrest bleeding but with difficulty.

During surgery, they left 4 mops intra-abdominal for pressure.

They used fresh blood 4 units & fresh plasma 3 units.

In theatre, Temp was 37˚C, BP 100/70mmHg and Pulse was 125/min.

The surgeon's diagnosis was severe post-partum haemorrhage.

The mother was discharged from theatre and returned to the ward at 11:15pm with a prescription to continue with IV N/S: Dextrose in a ratio of 4:1 in 24hrs.

She died at around 11:25pm which was 10 minutes after coming out of theatre.

Summary

10/09/12 at 09:00am (went to Kibuli for last ANC, admitted)

11/09/12 at 8:30pm (taken to theatre for C/S)

11/09/12 at 10:20pm (returned to theatre due to bleeding)

11/09/12 at 11:25 (died, 10 min from theatre)

6.8 Developing and implementing action plans | Workshop

Equipment

- ☐ Whiteboard / flip chart + pens

Key learning objectives

- To learn how to identify an issue or problem that requires change
- To understand how to formulate a plan for change that is SMART (Specific, Measurable, Achievable, Relevant or Realistic, Time-bound)

Instructions for the facilitator

Write the SMART acronym on the flip chart and explain to participants what is meant by a SMART plan. Emphasise that a plan should be specific and avoid aims that are too broad. Explain that all plans must lead to change that is measurable (auditable). The plan must be potentially achievable within the resources available. Hence it should not involve expenditure that is not available. It should relate directly to the problem identified and there must be a timeline with an end point. Every point in the plan should be delegated to a suitable person who is given responsibility for ensuring it happens.

Ask the participants to talk in pairs to identify 3 issues from their labour ward, theatre or post-natal ward that impact or could impact on patient safety and wellbeing.

List the issues identified on the flip chart.

Choose one issue and lead a discussion about how to make a SMART action plan that would tackle the issue. Go through each of S M A R T in turn to do this. Discuss how to anticipate problems along the way and consider how to tackle such problems.

If time allows, undertake the same process with each issue identified by the participants.

Encourage the participants to consider trying this out in their workplaces, in consultation with their managers.

S	=	Specific
M	=	Measurable
A	=	Achievable
R	=	Realistic
T	=	Time Bound

Sessions for anaesthetic specialists

6.9 Difficult intubation | Workshop

Equipment

- ☐ Airway head manikin
- ☐ Intubation kit (Laryngoscope, ETT assortment of sizes, tie, lube)
- ☐ AMBU bag + mask
- ☐ Guedel airways
- ☐ Bougie / stylet
- ☐ Yankauer suction
- ☐ LMA (various sizes)
- ☐ DAS laminates (master algorithm, algorithm 1)
- ☐ Whiteboard / flip chart + pens

Key learning objectives

- Identify which factors can help predict a potentially difficult intubation
- Identify which steps can be taken to help manage an unanticipated difficult intubation
- Demonstrate how to correctly use a bougie and stylet for a difficult intubation
- Identify correct placement of an endotracheal tube (ETT)
- Identify accidental oesophageal intubation

Instructions for the facilitator

This should be an interactive session (duration 30 minutes), have the participants standing around a table, with the equipment laid out on the table in front of you.

Work through the questions in the order they have been written.

Use the 4-stage approach to teach the skills within the workshop.

You have been provided with laminated copies of the DAS management of difficult tracheal intubation in obstetrics algorithm 1 to help you guide the participants through this workshop.

Use the whiteboard to write down the participants' answers. Write them in the correct order if they are sequential.

Facilitator: How can you predict whether a patient will be a potentially difficult intubation?

Expected answers:

- Airway assessment
- From the patient, if they have had a previous difficult intubation
- Patient notes
- Imaging: X-rays, CT

- Previous surgery to airway, face, neck
- Previous radiotherapy to the airway
- Facial burns
- Facial oedema
- Foreign bodies: including blood, vomit, excess secretions
- Difficulty positioning the patient adequately e.g. cervical spine fracture, cervical spondylosis, rheumatoid arthritis

Facilitator: What steps can you take to help manage a unanticipated difficult Intubation?

Try to elicit as many answers as possible from the participants on how to manage an unanticipated difficult intubation, before going through the DAS management of difficult tracheal intubation in obstetrics Algorithm 1 laminate (Figure 6.9.1).

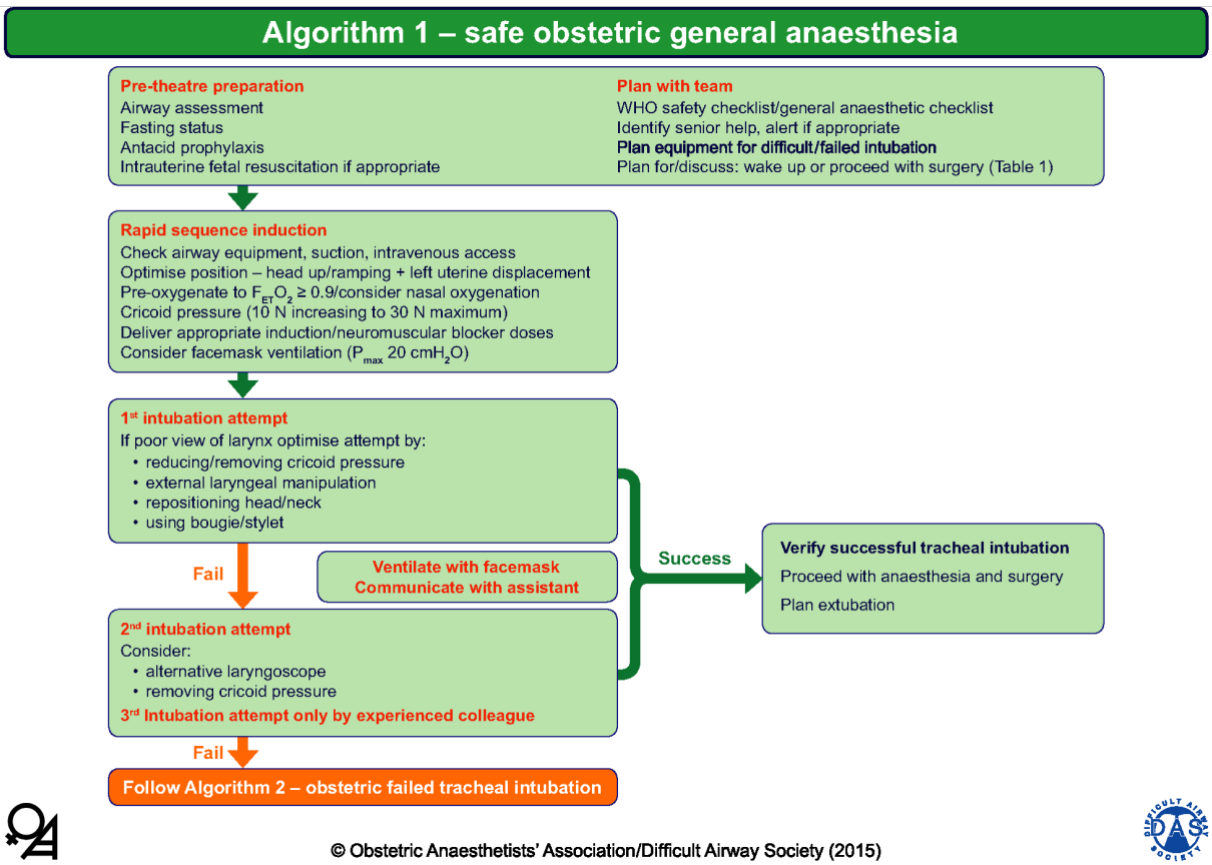

Figure 6.9.1: DAS Algorithm 1

Expected answers:

- Call for help (ideally a more senior anaesthetic provider).
- Continue to oxygenate the patient.
- Optimise patient position.
- Ensure you have given an adequate amount of time for the induction drugs to work, especially the muscle relaxants.
- Reduce force of cricoid pressure / completely remove cricoid pressure in an attempt to improve visualisation of the vocal cords.
- Consider using BURP (Backwards-Upwards-Right-Pressure).

- Try using a different laryngoscope (e.g. McCoy blade), or a bougie or stylet in the ETT.
- Change the operator trying to intubate (1 person should only have 2 attempts at intubating, 3rd attempt should be performed by a more senior operator).

Skills teaching: Difficult intubation requiring correct use of a bougie and stylet

Facilitator to demonstrate to the participants how to correctly use a bougie and stylet for a difficult intubation.

Pre-oxygenate the patient with 100% oxygen (for 3 minutes or for 5 vital capacity breaths).

1. Hold the laryngoscope in the left hand, insert blade into the right side of the mouth and sweep the tongue to the left.
2. Gently advance the laryngoscope until the epiglottis is seen, then place the tip of the laryngoscope in the vallecula (anterior to the epiglottis).
3. Then lift the epiglottis forward, being careful not to lever and damage the teeth.
4. Attempt to visualise the vocal cords.
5. Insert the bougie through the vocal cords if visualised or just underneath the epiglottis if unable to visual them.
6. Gently advance the bougie (if you are in the trachea you may feel the 'clicks' of the tracheal rings – the bougie will become held up once you hit the carina).
7. Keep the laryngoscope in position, and keep your eyes fixed on the patients airway at all times.
8. Ask your skilled assistant to railroad the ETT over the bougie, then keep hold of the bougie until your skilled assistant is able to grab hold of the other end of the bougie.
9. Pass the ETT through the cords while your skilled assistant holds the end of the bougie (you may need to slightly rotate the ETT anticlockwise in order to prevent the bevelled end getting caught on the arytenoids.
10. Hold onto to the ETT firmly, while asking your skilled assistant to remove the bougie.
11. Remove the laryngoscope.
12. Inflate the cuff.
13. Confirm correct placement of the ETT.
14. Tie the ETT.

Facilitator: How can you confirm correct placement of an ETT?

Expected answers:

- Visualise ETT passing through the cords
- Misting of the ETT
- Visualise chest rising
- Auscultation of breath sounds

- Appropriate tidal volumes and PIP
- Capnography ('gold standard – 6 complete waveforms')

Facilitator: How can you recognise an accidental oesophageal intubation?

Expected answers:

- No misting of the ETT
- Unable to visualise the chest rising
- Absent breath sounds on auscultation, but air audible over the stomach
- No capnography or decreasing amplitude of capnography waveform, which will reach zero after 5-6 breaths
- Abnormal lung compliance

Note If in doubt take it out, maintain cricoid pressure, maintain oxygenation and ventilation via bag valve mask then attempt re-intubation if deemed appropriate.

Failed intubation will be covered in the next workshop so do not discuss this algorithm now.

6.10 Failed Intubation | Workshop / Scenario

Equipment list

- ☐ Airway head manikin
- ☐ Intubation kit (Laryngoscope, ETT assortment of sizes, tie, lube)
- ☐ Ambu bag + mask
- ☐ Guedel airways
- ☐ Bougie
- ☐ L aryngeal Mask Airway (assortment of sizes)
- ☐ How to insert a supraglottic airway laminate
- ☐ Yankauer suction
- ☐ Size 10 blade with a handle
- ☐ For cricothyroidotomy model: kidney dish, ventilator tubing, tape
- ☐ DAS laminates (master algorithm, algorithm 2, algorithm 3, Table 1, Table 2 and Plan D emergency front of neck access)
- ☐ Whiteboard / flip chart + pens

Learning objectives

- Demonstrate the safe insertion of supraglottic airway
- Demonstrate how to safely navigate through the failed tracheal intubation in obstetrics algorithm
- Demonstrate safe decision making in an emergency situation
- Identify the anatomical landmarks for a surgical cricothyroidotomy
- Demonstrate how to safely perform a surgical cricothyroidotomy with a scalpel and bougie

Instructions for the facilitator

This is a skills workshop (duration 50 minutes) and therefore an interactive session, so have the participants standing around a table, with the equipment laid out on the table in front of them.

Work through the questions in the order they have been written.

You have been provided with laminated copies of the DAS management of failed tracheal intubation in obstetrics algorithms to help you guide the participants through this workshop.

Read out the scenario to the participants.

Consider using the whiteboard / flip chart to create a flow diagram with the participants of the different steps in the DAS algorithm.

Facilitator: Do pregnant women die from failed intubation?

Expected answer: No, but mothers do die from failure to **oxygenate** and ventilate them.

Note **T**he incidence of failed intubation is 10 times higher in the obstetric population.

Scenario

28 year old female, G2 P1 requires an emergency caesarean section for a prolonged fetal bradycardia. You need to give a general anaesthetic as the patient's platelets are only 45 x 10^9/l.

You attempt to intubate the patient, you try twice and a second operator then tries once, but you both fail to intubate.

Facilitator: What steps should be taken next?

Expected answer: Attempt to insert a supraglottic airway (maximum 2 attempts).

Before taking the participants through skills teaching 1, go through the DAS management of failed tracheal intubation in obstetrics Algorithm 2 laminate (Figure 6.10.1) first, in order to familiarise the participants with the algorithm (if time permits try to elicit the answers from the participants before showing them the laminate).

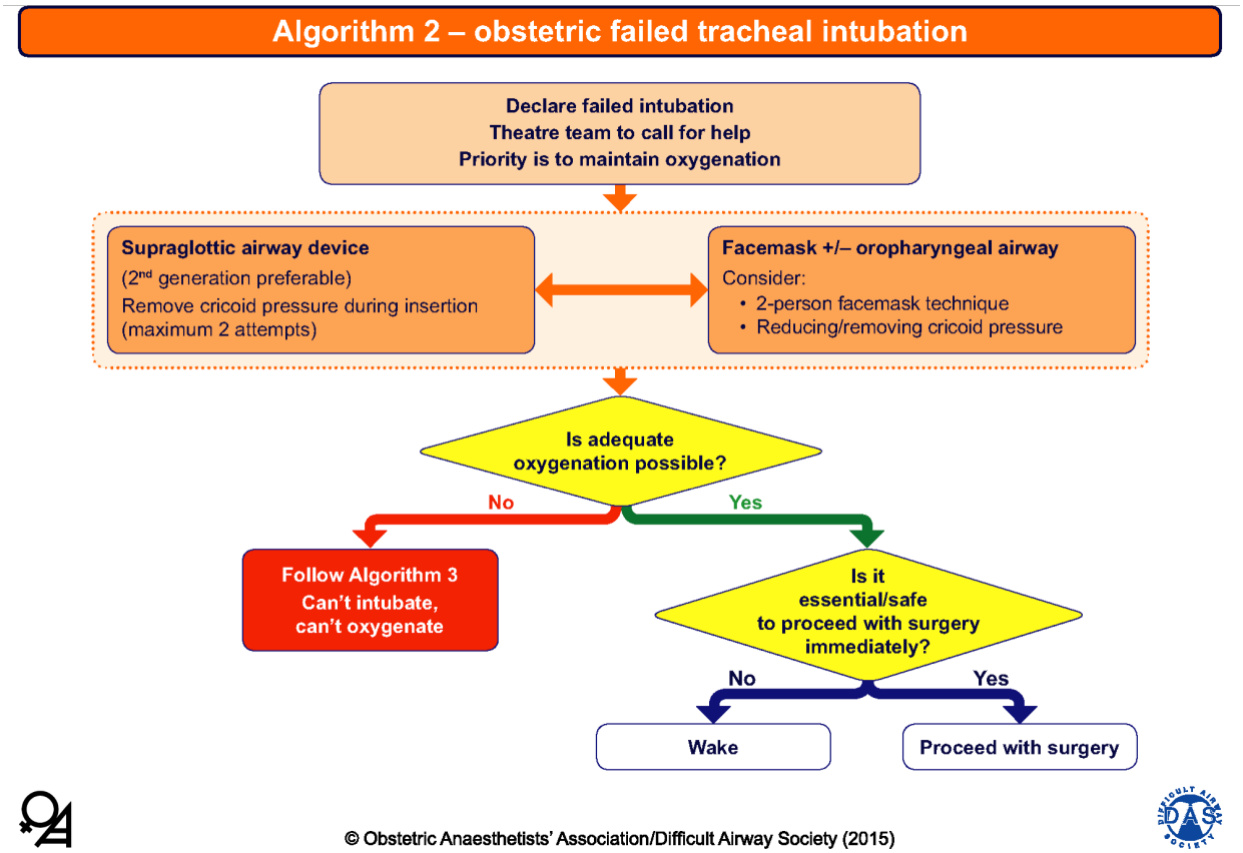

Figure 6.10.1: DAS algorithm 2

Skills teaching 1: Insertion of a supraglottic airway

- Declare a failed intubation
- Call for help
- Maintain oxygenation (with 100% oxygen)
- Attempt to insert a supraglottic airway (max 2 attempts)

Demonstrate to the participants how to insert an supraglottic airway.

Before commencing the skill familiarise the participants with the various features of a supraglottic airway, then get them to practice inserting one. (Remember some participants may never have seen a supraglottic airway).

Instructions for the skill station

- Chose the correct size supraglottic airway for the patient
- Check cuff integrity (remember an IGEL has no cuff)
- Ensure the LMA is lubricated before insertion
- Check the participants know how to correctly hold the supraglottic airway for insertion
- Consider the application of a jaw thrust, to aid with insertion
- Inflate the cuff (remember this is not required if you are using an IGEL)

Inform the participants to remove cricoid pressure during insertion of the supraglottic airway, then reapply after insertion to prevent aspiration of gastric contents.

Remember a supraglottic airway is not a definitive airway.

Table 6.10.1: Cuff inflation volumes for LMA

Adult LMA/iGEL	Patient weight	Max. cuff inflation volume with air for LMA
3	<50kg	20ml
4	50-70kg	30ml
5	> 70kg	40ml

Facilitator: What steps should you take if you fail to oxygenate and ventilate the patient after 2 attempts at trying to insert a supraglottic airway?

Expected answer: Attempt to oxygenate and ventilate using a facemask +/- Guedel, (a four-handed technique must be used, to improve your chances of success).

Refer to DAS management of difficult and failed tracheal intubation in obstetrics Algorithm 2 laminate (Figure 6.10.1)

This skill will not be practiced in this workshop, as it was covered earlier in the course during the Basic Airway workshop.

Facilitator: What are your options now, as you have been successful in oxygenating the patient with a facemask and Guedel using a four-handed technique, and the fetal bradycardia has now recovered?

Note for the facilitator

Familiarise the anaesthetists with the DAS laminates, but don't discuss what decision they would make if faced with such a situation, as this is covered in the multi disciplinary team failed intubation scenario.

Table 1 – proceed with surgery?

	Factors to consider	WAKE			PROCEED
Before induction	**Maternal condition**	• No compromise	• Mild acute compromise	• Haemorrhage responsive to resuscitation	• Hypovolaemia requiring corrective surgery • Critical cardiac or respiratory compromise, cardiac arrest
	Fetal condition	• No compromise	• Compromise corrected with intrauterine resuscitation, pH < 7.2 but > 7.15	• Continuing fetal heart rate abnormality despite intrauterine resuscitation, pH < 7.15	• Sustained bradycardia • Fetal haemorrhage • Suspected uterine rupture
	Anaesthetist	• Novice	• Junior trainee	• Senior trainee	• Consultant/specialist
	Obesity	• Supermorbid	• Morbid	• Obese	• Normal
	Surgical factors	• Complex surgery or major haemorrhage anticipated	• Multiple uterine scars • Some surgical difficulties expected	• Single uterine scar	• No risk factors
	Aspiration risk	• Recent food	• No recent food • In labour • Opioids given • Antacids not given	• No recent food • In labour • Opioids not given • Antacids given	• Fasted • Not in labour • Antacids given
	Alternative anaesthesia • **regional** • **securing airway awake**	• No anticipated difficulty	• Predicted difficulty	• Relatively contraindicated	• Absolutely contraindicated or has failed • Surgery started
After failed intubation	**Airway device/ ventilation**	• Difficult facemask ventilation • Front-of-neck	• Adequate facemask ventilation	• First generation supraglottic airway device	• Second generation supraglottic airway device
	Airway hazards	• Laryngeal oedema • Stridor	• Bleeding • Trauma	• Secretions	• None evident

Table 6.10.2: DAS table 1

Table 6.10.3: DAS table 2

Table 2 – management after failed tracheal intubation

Wake

- Maintain oxygenation
- Maintain cricoid pressure if not impeding ventilation
- Either maintain head-up position or turn left lateral recumbent
- If rocuronium used, reverse with sugammadex
- Assess neuromuscular blockade and manage awareness if paralysis is prolonged
- Anticipate laryngospasm/can't intubate, can't oxygenate

After waking

- Review urgency of surgery with obstetric team
- Intrauterine fetal resuscitation as appropriate
- For repeat anaesthesia, manage with two anaesthetists
- Anaesthetic options:
  - Regional anaesthesia preferably inserted in lateral position
  - Secure airway awake before repeat general anaesthesia

Proceed with surgery

- Maintain anaesthesia
- Maintain ventilation - consider merits of:
  - controlled or spontaneous ventilation
  - paralysis with rocuronium if sugammadex available
- Anticipate laryngospasm/can't intubate, can't oxygenate
- Minimise aspiration risk:
  - maintain cricoid pressure until delivery (if not impeding ventilation)
  - after delivery maintain vigilance and reapply cricoid pressure if signs of regurgitation
  - empty stomach with gastric drain tube if using second-generation supraglottic airway device
  - minimise fundal pressure
  - administer H_2 receptor blocker i.v. if not already given
- Senior obstetrician to operate
- Inform neonatal team about failed intubation
- Consider total intravenous anaesthesia

Facilitator: You were initially able to oxygenate the patient using a facemask and a Guedel using a 4 handed technique, but this is no long possible. You are now in a situation where you can't intubate and you can't oxygenate the patient, what steps should be taken next?

Expected answer: Perform a surgical cricothyroidotomy.

Skills teaching 2: Surgical cricothyroidotomy for CICO

Note for the facilitator

Before taking the participants through skills teaching 2, go through the DAS management of failed tracheal intubation in obstetrics Algorithm 3 laminate first (Figure 6.10.2), in order to familiarise the participants with the algorithm.

- Declare "can't intubate, can't oxygenate" (CICO) to theatre team
- Call for help (if not already done)
- Give 100% oxygen
- Exclude laryngospasm – ensure neuromuscular blockade
- Front-of-neck access

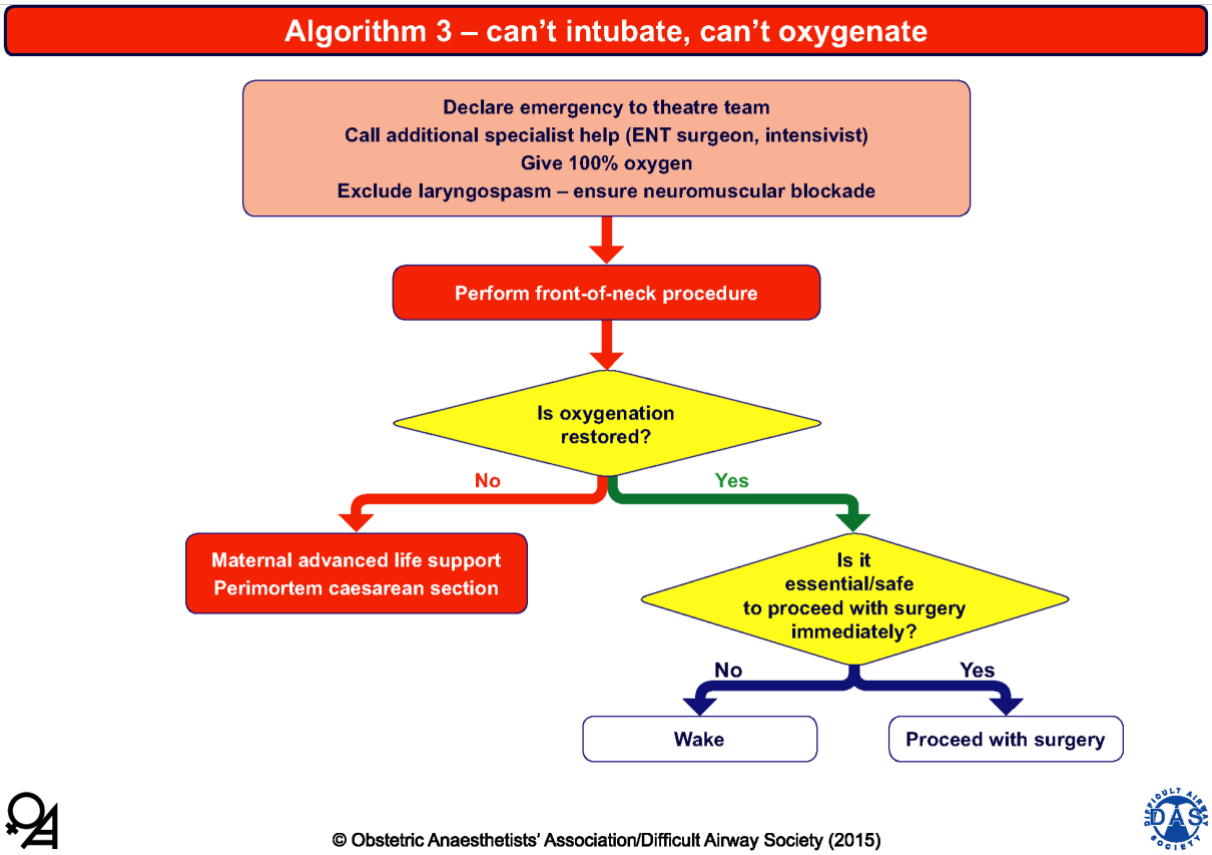

Figure 6.10.2: DAS algorithm 3

Facilitator: What equipment do you need to perform a surgical cricothyroidotomy?

Expected answers:

- Cuffed endotracheal tube size 6.0
- Scalpel: size 10 blade on a handle
- Bougie (with a coude – angled tip)

Facilitator: Do you have any of this equipment readily available in your hospital / theatre?

Demonstrate to the participants how to do a surgical cricothyroidotomy.

Use DAS laminate Plan D emergency front of neck access and the instructions below to help you teach this skill.

Surgical cricothyroidotomy as per DAS guidelines

Prior to performing a cricothyroidotomy:

- Position the patient to extend the neck.
- Identify the anatomical landmarks (use laminate, to ensure the participants know how to correctly identify the cricothyroid membrane.
- Perform a 'laryngeal handshake' with your non-dominant hand to identify and stabilise the cricothyroid membrane.

How to perform a cricothyroidotomy when the cricothyroid membrane is palpable:

- Make a transverse stab incision through the cricothyroid membrane with your dominant hand.
- Keep the scalpel perpendicular to the skin and turn the blade 90 degrees (the sharp edge of the blade should be facing caudally).
- Swap hands and hold the scalpel in position with your non-dominant hand.
- Maintain gentle traction, pulling the scapel towards you to open up the incision.
- Slide the coude tip of the bougie down the side of the scalpel blade with your dominant hand into the trachea.
- Advance the bougie into the trachea 10-15cm.
- Remove the scalpel, but keep the bougie in the trachea, stabilise the trachea with your non-dominant hand.
- Railroad a lubricated size 6.0 cuffed endo-tracheal tube into the trachea.
- Remove the bougie.
- Ventilate with high flow oxygen, inflate the cuff & confirm correct position with capnography.
- Secure the tube.

If you have time, briefly go through how to perform a surgical cricothyroidotomy on a patient whose cricothyroid membrane is not palpable. However, it is not essential to go through this if you have run out of time.

Surgical cricothyroidotomy as per DAS guidelines

How to perform a cricothyroidotomy when the cricothyroid membrane is NOT palpable:

- Make an 8-10cm vertical skin incision, caudad to cephalad.
- Use blunt dissection with fingers of both hands to separate tissues.
- Identify and stabilise the larynx .
- Proceed with technique for palpable cricothyroid membrane as above.

Scenario

28-year old female, G2 P1 requires an emergency caesarean section for a prolonged fetal bradycardia. You need to give a general anaesthetic as the patient's platelets are only 45 x 10^9/l.

You attempt to intubate the patient, you try twice and a second operator then tries once, but you both fail to intubate. What are you going to do next?

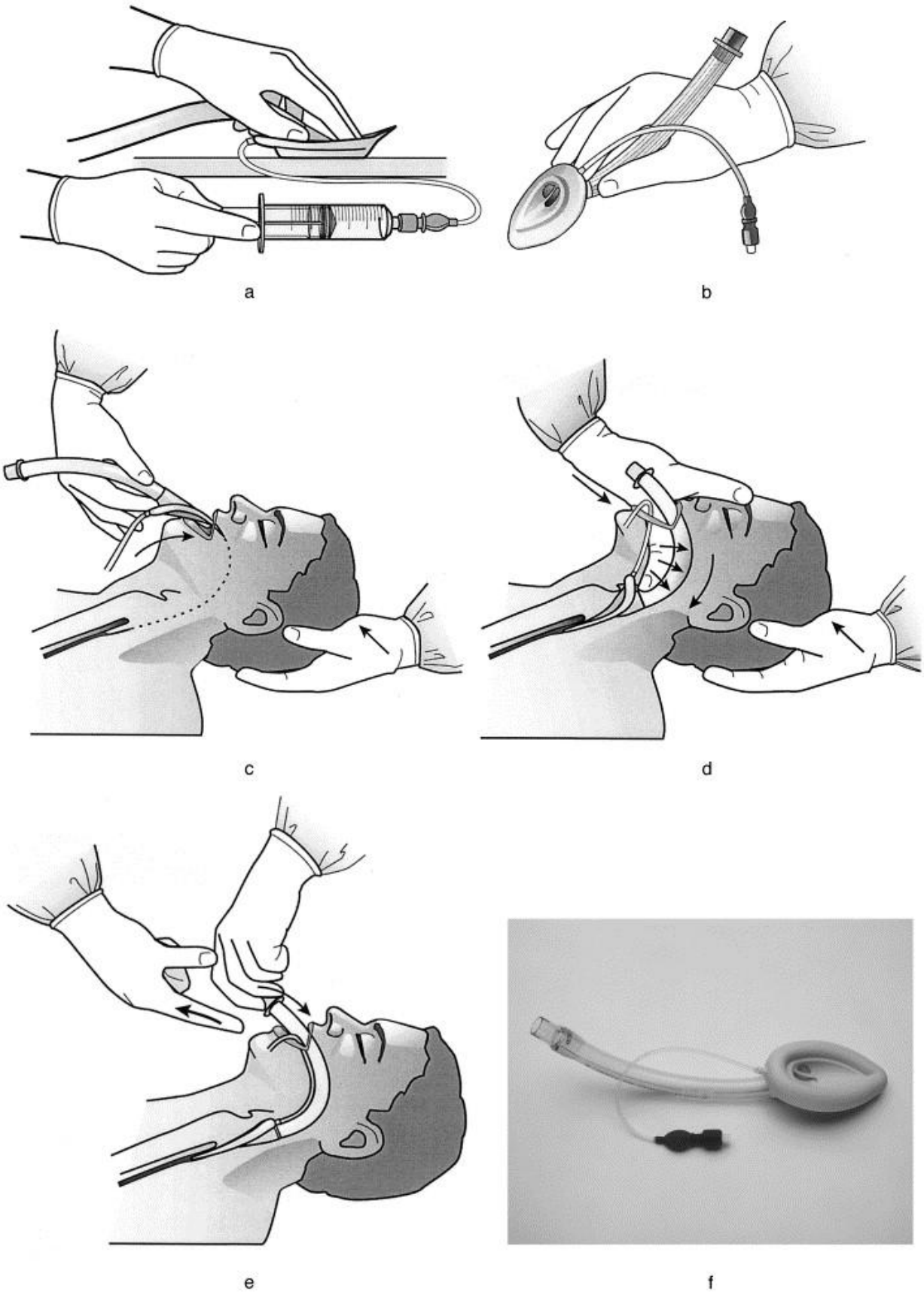

Figure 6.10.3: How to insert a supraglottic airway (Image: Science Direct)

6.11 High / Total Spinal | Workshop

Equipment

- ☐ Resus Annie Manikin
- ☐ Monitoring equipment: ECG, BP cuff, Pulse oximeter
- ☐ Oxygen mask + Guedel airway
- ☐ Laryngoscope
- ☐ ET tubes, syringe, tie, lube
- ☐ Bougie
- ☐ AMBU mask
- ☐ Laryngeal Mask Airway
- ☐ Yankauer suction
- ☐ Whiteboard / flip chart + pens
- ☐ Algorithm for the management of high regional blocks in obstetrics laminate

Learning outcomes

- Identify the key factors that contribute to a high/total spinal block
- Identify the key anatomical landmarks required to give a safe spinal anaesthetic
- Demonstrate how to test for an adequate sensory and motor block for a caesarean section
- Recognise signs and symptoms of a high or total spinal block
- Demonstrate appropriate management of a high and total spinal block

Instructions for the facilitator:

This should be an interactive session (duration 40 minutes), have the participants standing around a table, with the equipment laid out on the table in front of you.

Work through the questions in the order they have been written.

Use the equipment as props to help the participants work through the questions or scenarios.

Try to elicit the answers from the participants don't just tell them, this is meant to be an interactive session.

Facilitator: Has anyone had a high or total spinal anaesthetic?

Facilitator: What type of local anaesthetic do you use in your spinal anaesthetics?

Facilitator: What is hyperbaric local anaesthetic, and why is it the preferred local anaesthetic to use if available?

Expected answers:

- A local anaesthetic will become hyperbaric when Dextrose / glucose has been added (concentrations of Dextrose / glucose vary).
- If the local anaesthetic is hyperbaric, it means that this solution will be heavier than the cerebro-spinal fluid, therefore gravity can be used to manipulate the height of the block

Facilitator: How long can block height be manipulated with positioning after injecting hyperbaric local anaesthetic for a spinal anaesthesia?

Expected answer: For 20-30 minutes.

Facilitator: What doses of local anaesthetic do you use, and does anyone add an opioid?

Don't try to teach the participants how much local anaesthetic to put in their spinals, as this could result in potential harm to patients .

Facilitator: What causes a high/total spinal?

Try to elicit the answers from the participants don't just tell them, this is meant to be an interactive session. Consider using the whiteboard / flip chart to write down the participants answers.

Expected answers:

Drug factors

- Dose
    - block height more dependent on dose than volume
- Baricity
    - Cephalad spread is easier to control with hyperbaric local anaesthetic

The height of the block can be manipulated by changing the position of the operating table e.g.

- **Trendelenburg**: head down position (to increase the height of the block)
- **Reverse Trendelenburg**: head up position (to decrease the height of the block)

Patient factors:

- Body morphology
    - High BMI or abdominal girth
- Height of patient
- Gestation of the foetus

Technique factors:

- Barbotage
- Higher lumbar insertion may increase final block height
- The position of patient at the time of the injection as well as after the injection (sitting may minimise cephalad spread)
- Speed of the injection
- Direction of the spinal needle

Using the Resus Annie manikin as a model ask the participants to point out the anatomical landmarks for the location of dermatomes T10, T6 and T4 (start with T10 first and work upwards as most participants know where T10 is) (see Figure 6.11.1).

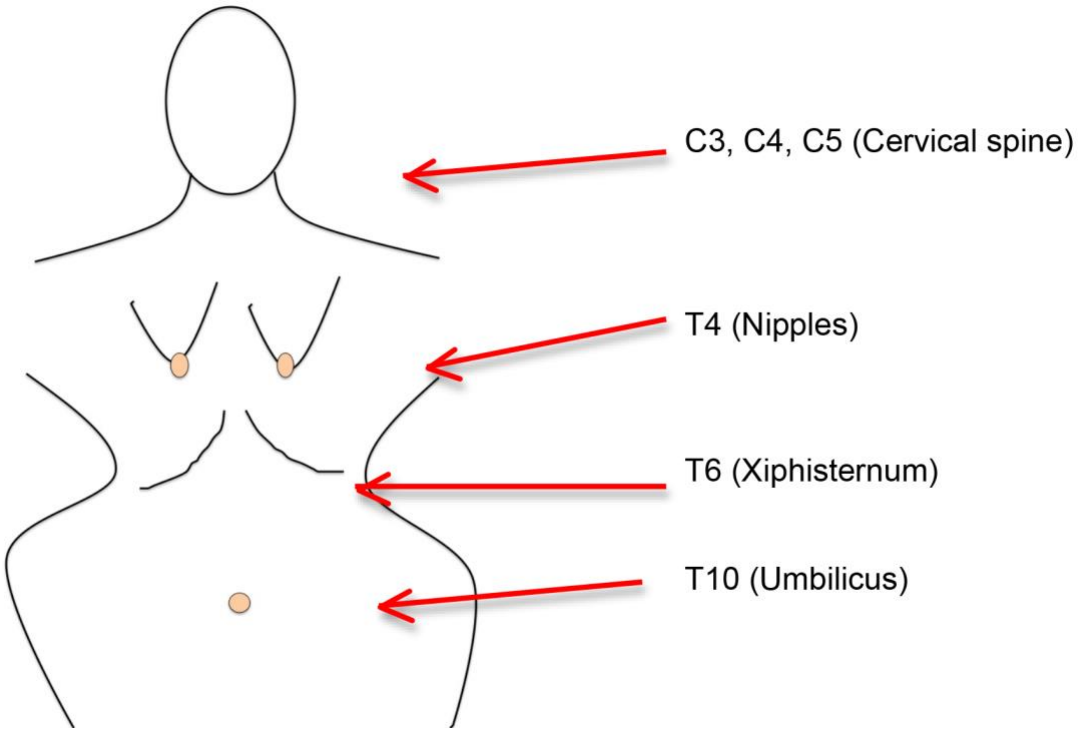

Figure 6.11.1: Guide to the location of dermatomes

Facilitator: What level do you block to in your clinical practice, and what is the ideal block level for a caesarean section?

Expected answer: T4

Facilitator: Do you find your obstetric patients sometimes complain of pain during a caesarean section?

Facilitator: Do you know why the patient can sometimes feel pain during the caesarean section

Facilitator: What dermatomes innovate the uterus?

Expected answer: T10

Facilitator: What dermatomes innovate the peritoneum?

Expected answer: T6

Note If T6 is **not** blocked when the gutters are cleaned, or the uterus is exteriorised, the patient will complain of pain.

Facilitator: What level is the diaphragm innervated at?

Expected answer: C3, C4, C5

Ask the participants to show the anatomical landmarks on Resus Annie.

A rhyme to help the participants remember: "C3, 4, 5 keeps the diaphragm alive."

Facilitator: How do you test that your block is adequate?

Expected answers:

- Motor: ask the participants to explain how they test this

Table 6.11.1: Bromage score

Grade	Criteria	Degree of block
1	Free movement of legs	Nil (0%)
2	Just able to flex knees with free movement of feet	Partial (33%)
3	Unable to flex knees, but with free movement of feet	Almost complete (66%)
4	Unable to move legs or feet	Complete (100%)

- Sensory: ask the participants to demonstrate how they perform this (to check this is done correctly)
- Sensory level block can be checked by loss of sensation to:
    - Ice
    - Alcohol soaked swabs
    - Pin-prick

Facilitator: What is the difference between a high and total spinal?

Expected answers:

- High spinal: Spread of the local anaesthetic block affecting the spinal nerves above T4
- Total spinal: Intracranial spread of local anaesthetic resulting in loss of consciousness

Facilitator: How do you recognise a high spinal?

Expected answers:

- Patient complains of difficulty breathing
- Patient complains of pin and needles in their hands
- If it's in only one hand, check it's not the BP cuff that's causing the pin and needles in this hand
- Patient complains of feeling light-headed, nausea/vomiting
- Drop in HR / BP

Facilitator: How would you assess power if the patient complains of pins and needles? (Check that the participants know the dermatomes of the hand).

Expected answer: Ask the patient to squeeze the anaesthetist's fingers.

Dermatomes of hand: any easy way for the participants to remember the dermatomes

C6: Thumb

C7: Middle finger

C8: Little finger

Note Important message to relay to the participants to help them with early detection of a rising block.

- The anaesthetist must perform regular checks to determine the height of the block
- On-going communication with the mother throughout the caesarean section
- Continuous monitoring of the patient's heart rate, BP and oxygen saturations throughout the caesarean section (the anaesthetist must continue to look at the monitor throughout the operation)

Note Patients develop a total spinal block as a result of the anaesthetist not being vigilant enough in theatre

Table 6.11.2: Spinal block locations and their effects

Root level	Systems affected	Effects
T1-T4	Cardiac sympathetic fibres blocked	Bradycardia Severe hypotension as bradycardia compounds hypotension from vasodilatation
C6-C8	Hands & arms	Paraesthesia (tingling) & weakness Accessory muscles of respiration affected
C3-5	Diaphragm & Shoulders	Diaphragmatic innervation, & therefore respiratory compromise – the patient will require intubation & ventilation Shoulder weakness is a warning sign of impending diaphragmatic compromise
Intracranial spread		Slurred speech Sedation Loss of consciousness

Scenario 1

Use Resus Annie manikin as a patient and the equipment available for this workshop to help the participants work through the scenario. Try to elicit the answers from the participants don't just tell them, this is meant to be an interactive session.

Facilitator: How are you going to manage a high spinal?

Expected answers:

- Call for help.
- Consider placing the woman in the head up position (reverse Trendelenberg), if using hyperbaric local anaesthetic.
- Give the patient 100% oxygen via a face mask
- ABCDE assessment (including checking the level of the block)
- Airway / Breathing: closely observe

- Circulation:
    - Place patient in left lateral tilt or manually displace the uterus (if not already in this position – check participants know why this is important to do, to relieve **aortocaval compression.**
    - Treat hypotension: with fluids +/- drugs.
    - Treat bradycardia: with drugs.

Facilitator: What drugs do you have available in your hospital to treat hypotension and what dose do you use?

Table 6.11.3: Drug for treating hypotension

Drug	Dose	Preparation
Ephedrine	3-9 mg or 1 to 3 mls boluses Max dose is 30mg as patients then develop tachyphylaxis	Add 1ml of Ephedrine (30mg/ml) to 9 mls of 0.9% normal saline to give you 3mg Ephedrine/ml
Adrenaline	10 microgram boluses	1 in 1000 = 1mg of adrenaline/ml Add 1ml of Adrenaline to 9 mls of 0.9% normal saline. This will give you 100micrograms Adrenaline/ml **Note** This is too high a concentration to give as a bolus for hypotension secondary to a high or total spinal). Add 1ml of the diluted Adrenaline (which will be 100 micrograms/ml) to 9 mls of 0.9% normal saline. This will then give you 10 micrograms Adrenaline/ml
Phenylephrine	25-50 microgram boluses	The dilution will depend on vial preparation the hospital stocks

Facilitator: What drugs do you have available in your hospital to treat bradycardia and what dose do you use?

Table 6.11.4: Drugs for dealing with bradycardia

Drug	Dose	Preparation
Atropine	600 micrograms boluses Maximum dose is 3mg	Vial preparations are usually 600 micrograms/ml
Glycopyrrolate	100-200 microgram or 0.5ml-1ml boluses	Vial preparations are usually 200 micrograms/ml
Adrenaline	10 microgram boluses	See table of drugs for treating hypotension, for how to 'double' dilute Adrenaline

Scenario 2:

Use Resus Annie manikin as a patient and the equipment available for this workshop to help the participants work through the scenario.

Facilitator: How are you going to manage a total spinal?

Expected answers:

- Call for help – announce to theatre that this is an anaesthetic emergency.
- Consider placing the woman in the head up position (reverse Trendelenberg), if using hyperbaric local anaesthetic.
- Give the patient 100% oxygen via a face mask.
- ABCDE assessment.
- Airway/Breathing:
    - Prepare drugs and equipment for intubation.
    - Don't forget to apply cricoid pressure.
    - Prepare for difficult intubation / failed intubation.
- Skilled assistant.
- Circulation:
    - Place patient in left lateral tilt or manually displace the uterus (if not already in this position – check participants know why this is important to do, to relieve **aortocaval compression.**
    - Treat hypotension: with fluids +/- drugs.
    - Treat bradycardia: with drugs.

Additional information to make the participants aware of if there is time.

- To provide anaesthesia for RSI, as the patient may be fully aware even if apparently unconscious. Assume that the mother is aware until drugs have been administered. Talk to the patient calmly and explain what you are doing.
- The patient MUST be ventilated, by hand if necessary, until the block wears off (usually 1-2 hours for a spinal). The patient MUST receive sedation until they start spontaneously breathing, and don't extubate until the patient has adequate tidal volumes
- Don't forget to document what happened on the anaesthetic chart, and remember to explain what happened to the patient once they are fully awake.
- A high regional block often develops early and rapidly but it can have a later onset (e.g. postoperative period), so remain alert to this possibility.
- Equipment and drugs to safely give a general anaesthetic must always be checked and prepared before performing a spinal anaesthetic, in the event that a failed or total spinal occurs.

The manual was produced by Emergency Obstetric Care and Quality of Care Unit, Department of International Public Health, Liverpool School of Tropical Medicine.

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