Module 1MO

Antenatal Care

Learning objectives

At the end of this module participants will:

- Understand the importance of antenatal care
- Understand the purpose of antenatal care
- Know the main principles of antenatal care, based on best evidence
- Be able to explain the importance of visits to a medical establishment before pregnancy and in early antenatal period
- Know which tests to conduct during antenatal care
- Describe problem-oriented approach as an alternative to traditional routine risk assessment and explain its advantages
- Be able to prioritize care in critical situations with involvement of a woman and/or her family in decision-making

Module Outline and Duration:

Part I – Classroom Activities - 75 minutes
Activity 1 – Introduction 5 min
Activity 2 – Brainstorming 10 min
Activity 3 – Interactive Presentation 55 min
Activity 4 – Summary 5 min

Part II – Clinical Work – 105 minutes
Activity 5 – Practice: consulting pregnant women on the topic: Birth Planning 105 min

Preparations of the Module

- Ensure that all participants have a copy of a Participant’s Manual
- Ensure that other facilitators know their responsibilities during the implementation of this module
- Before the clinical part of the module discuss Activity 5 with the management of Pregnancy Pathologies Department
Materials and Audio-visual Equipment

Materials
- Participant’s Manual
- Presentation 1MO EPC ENG

Equipment
- Video-projector or OHP
- Lecture notes
- Colour markers
- Name tags
- Blank transparencies

Key Messages
- The main objective of antenatal care is support and informing future parents, as well as ability to resolve problems that emerge during pregnancy.

- Pregnancy is not an illness. Over 85% of pregnancies require no medical interventions.

- It is important for a woman to receive care before pregnancy and as early as possible in the antenatal period.

- Care should be not risk-oriented but problem-oriented.

- Women that receive antenatal care need to have continuous and reliable information and understanding of their social needs and requirements.

- The key factor is not the number of antenatal visits, but performing procedures of proven effectiveness, which will increase the woman’s satisfaction with the provided care. Any intervention into the natural pregnancy process flow must be justified to be beneficial rather than harmful.

- Employment of traditional systems for risk assessment often leads to unjustified specialized care, while women with severe complications oftentimes lack such care.

- WHO does not recommend traditional risk-assessment systems. Instead vigilant approach for all pregnant women is being advocated. This means that women are to not to be initially regarded as “high risk”.

- Rather all women should be considered as having normal pregnancies until there is clear evidence to the contrary.
Part I - Classroom Activities

Activity 1 – Introduction (5 min)

• Display Slide 1MO-1 and discuss with participants the objectives of this module.

• Go to Slide 1MO-2 and tell the participants that antenatal care programmes, that are currently in use initially appeared from models developed in Europe during the first decades of the 20th century. Programmes’ core remained unchanged until now; however new, mostly diagnostic, medical technologies contribute new components to the antenatal care practice, yet, these innovations are often introduced without sufficient scientific evidence.

• Giving women more self-control opportunities during pregnancy fully coincides with their desires and needs.

• Women themselves emphasize the importance of continuous care by the same personnel, being listened to, and being provided with reliable information.

Move to Slide 1MO-3 with the aim of antenatal care, emphasize that the main goal of antenatal care is to assist the woman to remain healthy and thus aid the health of the unborn baby. This is accomplished through education, psychological and emotional support while providing vigilant care e.g. preventive interventions, screening throughout pregnancy and appropriate referral. Highlight the three important opportunities during antenatal care that should not be missed: promotion of healthy lifestyles, creating a birth plan, and preparation for childbirth and parenting.

Activity 2 – Brainstorming (10 min)

• Activity objective: learn what antenatal care practices exist in medical establishments represented by training participants.

• Ask the participants to describe their existing in-patient practice in terms of:
  o Organization of antenatal visits and their quantity
  o Routine antenatal screening

• Record everything reported by the participants in lecture notes.

• Ask the participants what is an optimal number of visits to an antenatal clinic in the case of a normal pregnancy and why?

• Discuss the reported options with the participants.

• Ask the participants which routine examinations should be conducted during pregnancy according to their opinion and experience, and why?

• Discuss the reasons for listing particular examinations with the participants.
Activity 3 - Interactive Presentation (55 min)

- Ask the participants their opinion on expectations of women that request antenatal care.

- After participants voice their opinions display Slide 1MO-4 and emphasize that medical personnel should keep in mind that pregnant women may have other priorities besides antenatal care, e.g. allocating resources and time for already existing children.

- Emphasize that the role of medical personnel is:
  - to support psychological adaptation to pregnancy, delivery, breast-feeding and parenthood;
  - to supervise pregnancy in order to secure health and wellbeing of mother and her foetus;
  - to examine all women in order to detect signs of obstetric complications;
  - to provide women with important information regarding their health: healthy nutrition, giving up smoking, HIV prevention, family planning, abuse prevention.

- Display Slide 1MO-5 and tell the participants that studies have shown that there is redundancy of visits for women with normal pregnancy flow.

- Turn to Slide 1MO-6 and ask the participants to refer to Attachment 2 at the end of “Participant’s Manual” and look at the “New WHO Antenatal Care Model: Table of Main Items”, which describes the new antenatal care organizational model developed by WHO. The model shows examinations and other activities that have to be included into each of the four visits that are required for women with normal progress of pregnancy. This model is just one of the many approved options. Discuss the proposed model of antenatal care with the participants. Participants may disagree with some of the model’s elements; emphasize that this is just one of the possible options.

- Display Slide 1MO-7 and explain that different countries, depending on their level of development and available resources, choose an acceptable system of antenatal care (preferably taking women’s requests into account).

- Move to Slide 1MO-8 and emphasize the importance to conform to the following principles:
  - Any intervention into the natural pregnancy and delivery process must be justified to be of benefit, rather than harm.
  - Any method, restricting mother’s independence, her freedom of choice, and access to her baby, requires absolute proof that such practice is of benefit, rather than harm.

- Display Slide 1MO-9 and tell the participants that receiving care during the early antenatal stage is very important to a woman. This fact requires special attention and the key point is for a woman to request medical pregnancy supervision as soon as possible. The importance of counselling before pregnancy is evident. Many deviations can be detected during antenatal supervision and prophylactic measures taken before conception may help avoiding a number of such deviations. For instance, it is difficult to influence on
frequency of preterm delivery during pregnancy, but it is much easier to do before pregnancy.

- Draw attention of participants to the importance of **routine** folic acid prescription before pregnancy and during the first pregnancy trimester to prevent defects of neuraxis development.

- Turn to Slide 1MO-10 and ask the participants to locate Attachment 3 in the “Participant’s Manual” with the description of routine procedures for antenatal care recommended by WHO. Discuss efficiency and advantages of the examination methods listed in the slide.

- Explain that besides routine examinations during antenatal care the following general principles should be respected:
  - Establish good contact; encourage woman to tell about how she feels and what bothers her.
  - Pay attention to general appearance of a woman, indicators of stress, anxiety, nervousness, any disturbances, as well as not getting enough sleep.

- Move to slide 1MO-11 and explain why it is not recommended to conduct the procedures listed in the slide.

- Display Slide 1MO-12 and discuss in detail the efficiency of fundal-symphisial height measurement during pregnancy and its representation on an antenatal growth chart (Slide 1MO-13). Ask the participants are their medical establishments use antenatal growth chart to follow fundus of uterus elevation changes? Draw participants’ attention to the fact that fundal-symphisial height measurement with a tape-measure and charting its dynamics on a antenatal growth chart is a simple and inexpensive method-of-choice for antenatal care. This method diagnoses small or large foetus size for the corresponding gestational age, however it does not always indicate pathology. Draw attention to antenatal growth chart’ completion and foetus development assessment techniques.

- Display Slide 1MO-14 and discuss in detail the efficiency of ultrasonography during pregnancy. Note, however, that the only thing being worse than the absence of an ultrasonic investigation is conducting a poor ultrasonic investigation. There is no evidence that an ultrasonic investigation has any benefit after Week 24 and therefore it is not recommended [A].

- Go to Slide 1MO-15 and give the participants a definition of obstetric risk. Explain the need to determine risk during pregnancy in obstetrics (by displaying Slide 1MO-16). Point out the requirements for vigilant, attentive and supportive attitude towards all women regardless of whether they belong to the risk-group or not.

- Display Slide 1MO-17 and discuss the difficulties that may arise during risk identification.

- Ask the participants if they are satisfied with risk assessment by scoring? Does this method predict which women will suffer complications and which won’t? Why?
Display Slide 1MO-18 with Case Study 1:

Anna, 22 years
Came to antenatal clinic with amenorrhea

History
- Second pregnancy - gestational age 10 weeks
- 1st delivery by caesarean section due to pelvis and head disproportion (foetus weight: 4.500 kg)
- No postoperative complications, the child’s growth is normal
- Chronic pyelonephritis, severe myopia

- Ask the participants’ opinion on the level of risk in the current situation and which factors would they use to attribute this woman to a particular risk-group? Also ask if a scoring system is used, what would this woman’s score be?

- Listen to participants’ opinions and discuss correctness and effectiveness of scored risk assessment for the current situation.

- Inform the participants that risk level is low in the current situation, since none of the anamnesis facts (chronic pyelonephritis, myopia) as well as none of the previous pregnancy issues (foetus weight: 4.500 kg, Caesarean section, pelvis and head disproportion) carry any risk for the current pregnancy as of Week 10.

- Display Slide 1MO-19 with Case Study 2:

Anna, 22 years
Came to antenatal clinic with amenorrhea

History
- Second pregnancy - gestational age 38 weeks
- 1st delivery by caesarean section due to pelvis and head disproportion (foetus weight: 4.500 kg)
- No postoperative complications, the child’s growth is normal
- Chronic pyelonephritis, severe myopia

- Ask the participants’ opinion on the level of risk in the current situation (same woman, 38th week of pregnancy) and which factors would they use to attribute this woman to a particular risk-group? Also ask if a scoring system is used, what would this woman’s score be?

- Listen to participants’ opinions and discuss correctness and effectiveness of scored risk assessment for the current situation.

- Tell the participants, that in this instance risk is increased, though neither chronic pyelonephritis, nor myopia have any significance, but before delivery this woman will automatically be attributed to a high-risk group.

- Display Slide 1MO-20 with Case Study 3:

Victoria, 36 years
Came to antenatal clinic with amenorrhea
History
- Fourth pregnancy – gestational age 14 weeks
- 1st delivery: preterm birth at 34 weeks of gestation, birth weight – 2,300 g. Child is alive.
- 2 miscarriages during week 10 – 12
- Pyelonephritis at the age of 16, ovary surgery (ovarian apoplexy), severe myopia
- Haemoglobin - 99 g/l

Ask the participants’ opinion on the level of risk in the current situation and which factors would they use to attribute this woman to a particular risk-group? Also ask if a scoring system is used, what would this woman’s score be?

Listen to participants’ opinions and discuss correctness and effectiveness of scored risk assessment for the current situation.

Inform the participants that the only risk in the current situation is miscarriage/premature birth. Miscarriage/premature birth risk is very high and this woman requires vigilant consulting and attention. All other factors mentioned in woman’s history have no risk for the current pregnancy.

Display Slide 1MO-21 with Case Study 4:

Irina, 26 years
Came to antenatal clinic with amenorrhea

History
- Second pregnancy – gestational age 14 weeks
- 1st delivery: preterm delivery at 34 weeks, birth weight – 2,300 g. Infant is alive.
- Haemoglobin - 109 g/l

Ask the participants’ opinion on the level of risk in the current situation and which factors would they use to attribute this woman to a particular risk-group? Also ask if a scoring system is used, what would this woman’s score be?

Listen to participants’ opinions and discuss correctness and effectiveness of scored risk assessment for the current situation.

Inform the participants that the only risk in the current situation is miscarriage/premature birth. Miscarriage/premature birth risk is low in the current situation.

Discuss in the general group whether they agree with conclusions.

Display Slide 1MO-22 and explain to the participants one more time that some establishments may use quantitative approach, for instance, the traditional risk-factor scoring method. In this method different “risk factors” concerning woman’s health and anamnesis, receive certain scores; based on total score, woman is attributed to a high, moderate, or low risk group.

Move to Slide 1MO-23 and emphasize that use of traditional risk assessment system often leads to unjustified specialized care, while women with severe complications oftentimes lack such care.
Display Slide 1MO-24 and inform the participants that WHO does not recommend traditional scoring systems for risk assessment; however, any pregnancy cannot be defined as risk-free. Therefore it is very important to watch closely for warning signs of serious and/or life-threatening complications. Detecting serious complications and referring to the appropriate level of care is one of the primary goals of antenatal care. However applying a medical model to all pregnant women is disadvantageous. An approach of vigilance for all pregnant women is being advocated.

Turn to Slide 1MO-25 and introduce the new proposed approach to the participants by explaining its point: vigilant approach is recommended to all pregnant women. This does not mean that all women should belong to a risk group; conversely, they should all be attributed to a group with normal pregnancy process unless there appear explicit indicators showing evidence of complications.

Display Slide 1MO-26 to illustrate consequences of traditional (score-based) system of risk assessment.

Mention the following facts to the participants: “…only between 10 and 30% of the women who are allocated to the high-risk groups actually experience the adverse outcome for which the scoring system declares them to be at risk. Between 20 and 50% of mothers who deliver preterm or low-birthweight infants have low risk scores.” (Murray W. Enkin et al., 2000, p.51)

Assistance should not be risk-oriented, but rather address resolution of a specific problem.

Once some complication is diagnosed, it should be carefully considered and questioned as to the extent and severity of the risk it poses for the woman and her baby. Some complications may result in temporary risk and later resolve themselves (e.g., transient rises in blood pressure). Just what the specific complication means for mother and baby should be defined accurately rather than be classified in some all encompassing risk category.

Classification as at risk should not automatically result in a routine treatment protocol for all women (e.g., immediate hospitalization). Such treatment protocols should be determined on the basis of the particular risk factor which the woman has, and the care she is offered should be tailored to her specific needs.

Activity 4 - Summary (5 min)

Ask the participants if they have any questions; answer these questions.

Turn to Slide 1MO-27 and say that over 85% of all pregnancies do not require interference of specialized doctors, therefore simple monitoring, psychological and emotional support should be considered a norm. Make recommendations while displaying Slide 1MO-28.

At the end of the module, tell the participants that a vigilant approach to all women is necessary and treatment protocols should be developed individually.
The main objectives of antenatal care are to support and inform future parents, as well as, to resolve problems that appear during pregnancy.

- Ask participants to open their “Participant guides” and find the Attachment 8 at the end of this module. Tell them that in this Attachment they can find the basic information on education for parenthood. Note, that you will not discuss this issue during this training course and this information is for their self-reading after the training course.

**Part II – Clinical Work (105 min)**

**Activity 5 – Practice: «Consulting Pregnant Women on the Topic: Birth Planning » (105 min)**

- Before starting the activity explain the goal of your visit to the management of the Pregnancy Pathologies Department and arrange for groups of participants to come and consult female patients of the department. Ask the medical personnel to assist in selecting women for this consulting.

- Ask the participants to locate “Birth Plan” (Attachment 6 to “Participant’s Manual”).

- Give the participants 5 minutes to review the “Birth Plan” and then discuss the necessity and importance of completing the document: (1) the woman is involved in decision-making of what is going to happen to her during birth; where and how she will give birth; who will be present there; (2) the medical staff member, who conducts birth planning together with a woman, receives additional information about her, her wishes, preferences and priorities, which will make further communication with the woman during delivery easier.

- Divide the participants into groups of 2 people. Explain that each pair will have to fill in birth plans with the female patients of Pregnancy Pathologies Department during 35-40 minutes.

- After completion of birth plans, ask each group to present their results. Ask each group what difficulties they encountered.

- After all presentations ask the participants’ opinion if this form is convenient. Can the participants use this form in their maternity hospitals?

- Ask the participants if they have any questions on birth planning; answer the questions.

- Finalize the module by emphasizing the convenience, efficiency and affordability of this technology.
References


Module 2MO

The Use of the Partograph

Learning objectives

At the end of this module, the participants will:

- Know the history and the background of the partograph
- Understand the effectiveness of the partograph for improving perinatal outcomes
- Know how a partograph is used and how to complete one
- Be able to interpret the partograph and use it to make decisions in managing labour

Module structure and duration:

Part I – Classroom work – 90 minutes
Activity 1 – Introduction 5 min
Activity 2 – Presentation 50 min
Activity 3 – Small group work 30 min
Activity 4 – Conclusion 5 min

Part II – Clinical Practice
Activity 5 – Practical use of a partograph

Module preparation

- Review the existing evidence and WHO recommendation regarding the partograph
- Ensure that all participants have a copy of a Participant’s Manual
- Ensure that the other facilitators know their duties in teaching this module

Materials and Audiovisual equipment

Materials
- Participant’s Manual
- Presentation 2MO EPC ENG
- Partograph on sheet of paper (for each participant)
- Laminated partograph of A3 format – 3

Equipment
Materials and Audiovisual equipment

- Multimedia or overhead projector
- Flip-Chart
- Colour markers
- Name badges
- Pencils (for each participant)

Key messages

- In the latent phase, the cervix dilates from 0 to 3 cm. The latent phase should not last longer than 8 hours.
- When labour moves from the latent to the active phase, the point of cervical dilatation on the partograph should be moved from the area of the latent phase to the Alert line in the active phase.
- The Alert line corresponds to dilatation rate of 1 cm per hour.
- In the active phase, the cervix dilates from 3 to 10 cm, with normal dilatation of no less than 1 cm / hour.
- If the woman is admitted to the maternity in the active stage of labour, cervical dilatation should be plotted on the Alert line.
- If the labour progresses successfully, cervical dilatation should not move to the right of the Alert line.
- When cervical dilatation moves to the right of the Alert line, it means that the dilatation rate is less than 1 cm per hour. In this case, obstetric interventions may be required (amniotomy, oxytocin).
- The Action line lies within 4 hours of the Alert line. If the cervical dilatation chart reaches this line, the reasons for slow progress of labour should be identified and appropriate measures taken.

Part I - Classroom work

Activity 1 – Introduction (5 min)

- Show Slide 2MO-2 and define the partograph.
- Show Slides 2MO-3 – 2MO-6 and discuss the history of a partograph.
• Show Slide 2MO-3 and explain that Friedman’s curve was the first attempt to identify the limits of normal dilatation rate and establish a standard for normal labour, define pathologies in labour and determine obstetric interventions.

• Show Slide 2MO-4 and discuss the first Philpott’s partograph. Explain in detail, the purpose of designing Alert and Action lines. This information is key to understanding the role of a partograph in the decision-making process. Interpretation which will be presented later. Highlight that the 1 cm per hour dilatation rate presented on the partograph as the Alert line is the slowest normal dilatation rate both for primaparae and for multiparae worldwide.

• Show Slide 2MO-5 and explain that by 1988 many different partographs had been developed. Give each participant a copy of a partograph printed on a sheet of paper, and say that in 1988 a working group of WHO experts analyzed and synthesized the best points of the existing partographs and developed the WHO partograph within the Safe Motherhood initiative.

• Show the participants Slides 2MO-6 and 2MO-7 and show the benefits of a partograph confirmed by a multicenter trial in a number of settings in South-East Asia. The number of women involved was 35,484.

• The WHO proposes using the partograph as a tool to improve labour management and reducing maternal morbidity and mortality, as well as foetal morbidity and mortality.

**Activity 2 – Presentation (40 min)**

• Show Slide 2MO-8 and 2MO-9 and explain how to use a partograph.

• The main principles for use are as follows:

  • The partograph is used to manage mainly the first stage of labour the partograph is designed to be used mainly for monitoring the first stage of labour.

  • However, even after full cervical dilatation is reached, you should continue to record vital information related to the mother and the fetus, such as foetal heart rate, uterine contractions, maternal pulse, and blood pressure. Listen and record the foetal heart rate at least every 5 minutes during the second stage of labour.

  • Filling in the partograph starts when:
    - Two or more uterine contraction in 10 minutes, each lasting 20 seconds or more in the latent phase
    - One or more uterine contraction in 10 minutes, each lasting 20 seconds or more in the active phase
    - No complications requiring emergency care and/or delivery

• The partograph should be filled during labour, not after labour.

• The partograph should be kept in the labour room during the labour
- The partograph should be completed and interpreted by trained personnel (midwife or obstetrician)

- The partograph should be stopped if:
  - The first stage of labour is over
  - There are complications requiring emergency delivery

Emphasize that the use of the partograph should not be limited to women in low risk groups.

Since the partograph is an effective tool to monitor the progress of labour, and maternal and foetal status, it should be used for women in high risk groups.

The partograph may be used for managing breech presentations, deliveries with a uterine scar and multiple births; however, its effectiveness for improving birth outcomes in these situations is not supported by evidence.

The statement that a partograph should be used only for normal labour is incorrect because:
- “Normal labour” is a conclusion made after labour, while a partograph is used mainly during the first stage of labour.
- The objective of a partograph is not only to detect abnormal labour but to monitor the effectiveness of interventions (e.g., unsatisfactory progress of labour and oxytocin stimulation).

- Show Slide 2MO-10 and explain which patient information is recorded on the partograph: first and last name, obstetric data (number of current pregnancy, number of births in anamnesis), the # of birth cases in the mother’s history file, date of hospitalization, time of hospitalization, hours since membrane rupture at the moment the partograph was started. All this general information is recorded in the upper part of the partograph.

- Show Slide 2MO-11 and explain that in the “Time” line the time of admission to the maternity department is recorded. Below, the real time of the day from the moment of admission is written.

- Explain in detail the structure of the “cervical dilatation” chart:
  - On the left, there is a vertical line of numbers from 0 to 10. Each number / cell refer to 1 cm dilatation. The X-axis represents 24 cells, each referring to 1 hour.
  - The Latent phase section takes 8 hours (the latent phase should not last longer than 8 hours) and up to 3 cm (when dilatation reaches 3 cm the woman is said to enter the active phase). The section is bordered with thick lines.
  - The Active phase section starts with 3 cm dilatation up to 10 cm in column and from the 9th hour on the right end of the partograph in line.
  - In the Active line section the Action line is marked. It is a straight line from 3 to 10 cm. Remind participants that the Alert line is the 10th percentile of dilatation and corresponds to 1 cm per hour dilatation rate.
  - The Action line is parallel to the Alert line, 4 hours to the right.
• Show Slide 2MO-12, an example of plotting cervical dilatation in the latent phase on the partograph and explain the information plotted on the partograph.

• Cervical dilatation is assessed every 4 hours (if no indications for more frequent examinations) and is plotted with an X. The X-symbols are connected with a line.

• Tell the participants that there are two options for moving to the active phase. Show Slide 2MO-13 and explain that the first mode is when cervix gradually (in 8 hours) dilates reaching 3 cm. In the active phase a vaginal examination is performed every 4 hours and plotted on the partograph with an X. The symbols are connected with a straight line.

• Show Slide 2MO-14 and explain the other option in details when cervical dilatation reaches 3 cm or more in less than 8 hours. In this case, at first cervical dilatation is plotted according to the time line. The X symbol will be located on the thick line corresponding to 3 cm, or above it.
  o As labour goes into the active phase, plotting must be TRANSFERED to the Active phase area. To achieve this, X is plotted directly on the Alert line in the place which corresponds to the dilatation. The value of time is also moved and plotted to the left of the vertical line where the moved X is located. The X symbols located in line are connected with a broken line.
  o Note that all values plotted on the partograph are moved, including: foetal head descent, contractions, foetal heart rate (FHR), amniotic fluid, maternal status.
  o Further time count and plotting is done from the TRANSFERED time.

• Go to Slide 2MO-15 and explain that the 4 hours distance between Alert and Action lines was randomly selected, but it proved to be most appropriate to assess the situation.

• Remind them that when the cervical dilatation chart crosses the Alert line, the risk of neonatal resuscitation is 4 times higher, and when cervical dilatation chart reaches and crosses the Action line, the risk of intranatal stillbirth is 10 times higher.

• Show slides 2MO-16 - 2MO-19 and explain how to interpret the partograph depending on the location of the dilatation chart regarding the Alert and Action lines. Make sure to tell participants which actions should be taken and why.

• Slide 2MO-16. If the cervical dilatation chart is located to the left to the Alert line, it means that the dilatation rate is over 1 cm per hour. The progress is normal, no intervention is needed, but monitoring is required.

• Slide 2MO-17. If the cervical dilatation chart is located on the Alert line, it means that the dilatation rate is 1 cm per hour. The progress is normal, no intervention is needed, but monitoring is required.

• Slide 2MO-18. If the cervical dilatation chart is located on the right of the Alert line, it means that the dilatation rate is less than 1 cm per hour. The progress is abnormal, amniotomy is required. If one hour after amniotomy active labour
does not start (3-4 contractions during 10 minutes, each lasting over 40 seconds), oxytocin stimulation is necessary.

- If the facility has no opportunity to provide operative care in delivery (Caesarean section, vacuum-extraction, and forceps) due to lack of equipment and/or trained staff, the woman must be referred to higher level of care when the Alert line is crossed.

**Slide 2MO-19.** Reaching and crossing the Action line requires the following measures:
- Full clinical assessment of maternal and foetal status and the obstetric situation
- Delivery by caesarean section in case of foetal distress or obstructive labour
- If no contraindications – start IV infusion of oxytocin
- Vaginal examination in 3 hours, then every 2 hours
- If dilatation rate of 1 cm per hour between any two examinations is not reached – caesarean delivery.

- Move to **Slide 2MO-20** and explain a RCT (n = 3000 women) comparing the effectiveness of different partograph Action lines (2 hours vs. 4 hours). Primary outcomes were rate of caesarean delivery and maternal satisfaction. It was noted that the two-hour interval between the Alert and Action lines has no advantage over the 4 hour interval. Moreover, the 2 hour action line increases interventions without improving maternal and neonatal outcome.

- Move to **Slide 2MO-21** and explain how to assess foetal head descent with abdominal examination.
  - For convenience, the width of the five fingers is a guide to assessing the head above the rim. A head which is mobile above the rim will accommodate the full width of five fingers.
  - As the head descends, the portion of the head remaining above the rim, will be represented by fewer fingers (4/5th, 3/5th, etc.). It is generally accepted that the head is engaged when the portion above the rim is represented by two fingers’ width or less.
  - Descent of the head should always be assessed by abdominal examination immediately before doing a vaginal examination so that you will know where to expect to feel the head during the vaginal examination.

- Show **Slide 2MO-22** and explain to the participants the rules of plotting foetal head descent.
  - Foetal head descent is plotted with a “O” on the chart.
  - To plot foetal head descent on the partograph, use the “Foetal head descent” scale marked from 5 to 0.
  - Remember that measuring descent of the baby’s head helps the health professional follow the progress of labour.

- Show **Slide 2MO-23** an example of plotting cervical dilatation and foetal head descent when the woman is admitted in the latent phase.

- Show **Slide 2MO-24** an example of plotting cervical dilatation and foetal head descent when the woman is admitted in the active phase.
• Show **Slide 2MO-25** and explain to the participants the rules of plotting the intensity and length of uterine contractions.
  o Contraction frequency is plotted on the time axis.
  o The partograph records:
    Below the time line and on the left hand side is written “contractions per 10 minutes”. Squares are numbered from 1–5. Each square vertically represents one contraction so that if two contractions are felt in ten minutes, two squares will be shaded. Each cell in line represents 30 minutes
  o Three types of shading are used on a partograph: dots, diagonal lines and solid colours.

• **Oxytocin**: Oxytocin administration is recorded in a corresponding cell in MU/L and drops/min. The drop frequency is counted and recorded every 30 minutes.

• Go to **Slide 2MO-26** show an example of recording contraction intensity on the partograph and explain how the information is recorded.

• Show **Slide 2MO-27** and explain the principles of recording foetal heart rate
  o Each cell on the Y-axis in the Foetal heart rate section represents the value; each cell on the X-axis represents 30 minutes.

  o Foetal heart rate is registered and plotted on the partograph every 30 minutes. The plotting is done in dots which are connected forming a chart.

  o Note that the mentioned frequency of FHR assessment (every 30 minutes) is the minimum rate that WHO recommends. More frequent auscultation, e.g., every 15 minutes (Ukraine) may be adopted nationally or in a facility, if resources allow (the midwife-patient ratio, the daily number of births). Less frequent auscultation than 30 minutes will not allow staff to detect abnormal foetal status in a timely way.

  o A rate of >160 beats/min (tachycardia) and < 120 beats may indicate fetal distress.

  o If an abnormal heart rate is heard, listen every 15 minutes for at least 1 minute immediately after contraction. If the heart rate remains abnormal over 3 observations, action should be taken unless delivery is very close. A heart beat of 100 or lower indicates very severe distress and action should be taken at once. In facilities with no other way to confirm foetal distress (cardiotocography, blood sampling (pH) of the presenting part, etc.), these findings support the decision for urgent delivery.

  o Remind participants that today a number of sources give different information regarding the “normal” FHR range. The possible options are: 120-160 (WHO), 110-150 (FIGO), 110-160 (RCOG),

  o Also, highlight the WHO’s recommended auscultation technique:
    • Auscultation is performed when the woman lies on the side

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• Auscultation begins at the end of the contraction peak
• Duration of the auscultation – not less than 60 seconds

• Amniotic fluid: The integrity of membranes and the colour of amniotic fluid are checked during every vaginal examination and recorded on the partograph (show Slide 2MO-28)

• The colour of amniotic fluid should be recorded: clear ("C"), blood ("B") or meconium-stained ("М"). If the membranes are intact – “I”.

• Moulding of the foetal skull bones: Moulding is an important finding because it indicates how well the pelvis will accommodate the foetal head. Moulding assessment is performed at every vaginal examination and recorded on the partograph (show Slide 2MO-29).

• Recorded as follows: bones are separated and the sutures can be felt easily (0); bones are just touching each other (+); bones are overlapping (++); bones are seriously overlapping (+++).

• Show Slide 2MO-30 and explain how to record the maternal status in labour.
  o Drugs and IV solutions: The injections administered are marked in empty fields.
  o Pressure, pulse, temperature: Regularly registered in special cells of the partograph. Pulse (plotted with dots on the partograph) should be taken every half an hour, arterial pressure (reported by a line between systolic and diastolic pressure values) and temperature – every 4 hours (or more often, if necessary).
  o Urine: The amount of urine is registered at every urination. Woman should be encouraged to pass urine every 2-4 hours. The protein and acetone should be tested, if indicated.
  o All the observations about the mother’s condition are written at the bottom of the partograph at the time line.

• Ask one of the participants to answer questions (using the information on the slide):
  o What was the mother’s pulse, blood pressure and temperature at the first measurement?
  o How would you assess the general condition of the mother?

• Show Slide 2MO-31 and conclude by saying that the partograph is a simple, clear, easy-to-use, cost-effective means of monitoring labour and there is strong evidence of real effectiveness even with limited equipment.

• Ask the participants if they have any questions. Answer the questions.
Activity 3 – Small group work (30 min)

- Split the trainees into three groups.
- The goal of the small group work is filling in partographs and presenting them afterwards.
- Distribute the case studies. Ask participants to plot the information presented in the case on the partograph AND add the necessary information showing a normal FHR every 30 minutes, contractions per 10 minutes every 30 minutes and a normal maternal pulse every 30 minutes. They will present the completed partograph to the entire group.
- Ask the participants of the entire group to evaluate whether the partograph was filled in correctly.

Case study 1

Iryna K. A history of 4 pregnancies and 3 births. Birth record file # 1620, admitted on 16.04 at 22:00

22:00

Fetal heart rate - 136 beats / min  
Amniotic fluid – intact 
Head moulding – no  
Cervical dilatation – 3 cm 
Head descent - 4/5  
Contractions in 10 min – 3 contractions of less than 40 seconds 
Blood pressure – 120/70  
Pulse – 70 beats /min  
Temperature – 36.4 ºC  
Urine – 90 ml

Fetal heart rate
22:30 - 140 beats / min,  
23:00 - 150 beats / min,  
23:30 - 140 beats / min,  
00:00 - 130 beats / min,  
00:30 - 140 beats / min,  
01:00 - 146 beats / min,  
01:30 - 132 beats / min,

Contractions per 10 minutes
22:30 - 3 contractions of less than 40 seconds,  
23:00 - 3 contractions of more than 40 seconds,  
23:30 - 3 contractions of more than 40 seconds,  
00:00 - 3 contractions of more than 40 seconds,  
00:30 - 4 contractions of more than 40 seconds,  
01:00 - 4 contractions of more than 40 seconds,  
01:30 - 4 contractions of more than 40 seconds
**Pulse**
22:30 - 80 beats / min,
23:00 - 80 beats / min,
23:30 - 90 beats / min,
00:00 - 90 beats / min,
00:30 - 90 beats / min,
01:00 - 80 beats / min,
01:30 - 80 beats / min,

02:00

Fetal heart rate - 140 beats / min
Amniotic fluid – clear (membrane rupture during the examination)
Head moulding – the bones slightly overlap
Cervical dilatation – 8 cm
Head descent - 2/5
Contractions in 10 min – 4 contractions of more than 40 seconds
Blood pressure – 125/80
Pulse – 82 beats /min
Temperature – 36.7 ºC
Urine – 140 ml

**Delivery – 02:50**

A live boy
Weight – 3600
Length – 54 cm
Apgar – 9/10 points

**Case study 2**

Olga M. Third pregnancy, second birth. Birth record file # 300, admitted on 31.03 at 09:00

09:00

Fetal heart rate – 132 beats /min
Amniotic fluid – intact
Head moulding – no
Cervical dilatation – 2 cm
Head descent – 5/5
Contractions in 10 min – 2 contractions each lasts 25 seconds
Blood pressure – 140/80
Pulse – 80 beats /min
Temperature – 36.4 ºC
Urine – 120 ml

**Fetal heart rate**
09:30 - 140 beats / min,
10:00 - 150 beats / min,
10:30 - 130 beats / min,
11:00 - 130 beats / min,
11:30 - 140 beats / min,
12:00 - 150 beats / min,
12:30 - 150 beats / min,
Contractions per 10 minutes
09:30 - 2 contractions each lasts 25 seconds,
10:00 - 3 contractions each lasts 25 seconds,
10:30 - 3 contractions each lasts 30 seconds,
11:00 - 3 contractions each lasts 30 seconds,
11:30 - 3 contractions each lasts 35 seconds,
12:00 - 3 contractions each lasts 35 seconds,
12:30 - 3 contractions each lasts 35 seconds

Pulse
09:30 - 80 beats / min,
10:00 - 80 beats / min,
10:30 - 90 beats / min,
11:00 - 90 beats / min,
11:30 - 90 beats / min,
12:00 - 80 beats / min,
12:30 - 80 beats / min,
13:00

Fetal heart rate – 140 beats /min
Amniotic fluid – clear, membrane rupture at 12.30
Head moulding – no
Cervical dilatation – 5 cm
Head descent – 4/5
Contractions in 10 min – 3 contractions each lasts 35 seconds
Blood pressure – 135/80
Pulse – 82 beats /min
Temperature – 36.4 ºC
Urine – 150 ml

Fetal heart rate
13:30 - 140 beats / min,
14:00 - 150 beats / min,
14:30 - 130 beats / min,
15:00 - 130 beats / min,
15:30 - 140 beats / min,

Contractions per 10 minutes
13:30 - 3 contractions each lasts 35 seconds,
14:00 - 3 contractions each lasts 40 seconds,
14:30 - 3 contractions each lasts 50 seconds,
15:00 - 4 contractions each lasts 55 seconds,
15:30 - 4 contractions each lasts 55 seconds,

Pulse
13:30 - 80 beats / min,
14:00 - 80 beats / min,
14:30 - 90 beats / min,
15:00 - 90 beats / min,
15:30 - 90 beats / min,

16:00

Fetal heart rate – 146 beats /min
Amniotic fluid – clear
Head moulding – the bones slightly adjust
Cervical dilatation – 10 cm
Head descent – 1/5
Contractions in 10 min – 4 contractions each lasts 55 seconds
Blood pressure – 140/80
Pulse – 88 beats /min

Delivery – 16:20

A live boy
Weight – 3800
Length – 54 cm
Apgar – 8/9 points
Case study 3

Valentyna S. First pregnancy, no history of births. Birth record file # 411, admitted on 25.01 at 04:00

04:00

Fetal heart rate – 132 beats /min
Amniotic fluid – clear, membrane rupture at 2.30
Head moulding – no
Cervical dilatation – 1 cm
Head descent - 4/5
Contraction in 10 min – 3 contractions each lasts 30 seconds
Blood pressure – 110/60
Pulse – 70 beats /min
Temperature – 36.2 ºC
Urine – 80 ml

Fetal heart rate
04:30 - 140 beats / min,
05:00 - 150 beats / min,
05:30 - 150 beats / min,
06:00 - 140 beats / min,
06:30 - 140 beats / min,
07:00 - 130 beats / min,
07:30 - 150 beats / min,

Contraction per 10 minutes
04:30 - 3 contractions each lasts 30 seconds,
05:00 - 3 contractions each lasts 25 seconds,
05:30 - 3 contractions each lasts 30 seconds,
06:00 - 3 contractions each lasts 30 seconds,
06:30 - 3 contractions each lasts 40 seconds,
07:00 - 3 contractions each lasts 40 seconds,
07:30 - 3 contractions each lasts 40 seconds

Pulse
04:30 - 80 beats / min,
05:00 - 80 beats / min,
05:30 - 90 beats / min,
06:00 - 90 beats / min,
06:30 - 90 beats / min,
07:00 - 80 beats / min,
07:30 - 80 beats / min,

08:00

Fetal heart rate – 136 beats /min
Amniotic fluid – clear
Head moulding – no
Cervical dilatation – 4 cm
Head descent - 4/5
Contraction in 10 min – 3 contractions each lasts 45 seconds
Blood pressure – 115/65
Pulse – 74 beats /min
Temperature – 36.6 ºC  
Urine – 150 ml  

**Fetal heart rate**
08:30 - 140 beats / min,  
09:00 - 150 beats / min,  
09:30 - 150 beats / min,  
10:00 - 140 beats / min,  
10:30 - 140 beats / min,  
11:00 - 130 beats / min,  
11:30 - 150 beats / min,  

**Contractions per 10 minutes**
08:30 - 3 contractions each lasts 45 seconds,  
09:00 - 3 contractions each lasts 45 seconds,  
09:30 - 3 contractions each lasts 50 seconds,  
10:00 - 3 contractions each lasts 50 seconds,  
10:30 - 4 contractions each lasts 50 seconds,  
11:00 - 4 contractions each lasts 50 seconds  
11:30 - 4 contractions each lasts 50 seconds  

**Pulse**
08:30 - 80 beats / min,  
09:00 - 80 beats / min,  
09:30 - 90 beats / min,  
10:00 - 90 beats / min,  
10:30 - 90 beats / min,  
11:00 - 80 beats / min,  
11:30 - 80 beats / min,  

**12:00**

Fetal heart rate – 150 beats /min  
Amniotic fluid – clear  
Head moulding – no  
Cervical dilatation – 9 cm  
Head descent - 2/5  
Contractions in 10 min – 4 contractions each lasts 50 seconds  
Blood pressure – 120/80  
Pulse – 90 beats /min  
Temperature – 36.5 ºC  
Urine – 110 ml  

**Delivery – 13:10**

A live girl  
Weight – 3100  
Length – 50 cm  
Apgar – 8/9 points  

- Discuss each presentation with the whole group.
**Activity 4 – Conclusion (5 min)**

- It is good to allow the participants to formulate their own conclusions about the module. They need to answer the following questions:
  
  - What is more informative and easy to read – a partograph or birth file records?
  - How does a partograph make it easier to monitor the progress of labour?
  - Does the partograph help to make logical obstetric decisions?
  - Is this technology expensive?

To conclude, draw the participants’ attention to the fact that a partograph is the simplest and one of the most effective tools ever developed for managing deliveries. A graphic representation is very helpful.

**Part II – Clinical practice**

**Activity 5 – Practical use of partograph**

- Split the participants into 3 groups.

- The objective of the small group work is to review clinical cases with the use of a partograph.

- Distribute copies of a partograph printed on a sheet of paper or on a transparent sheet, to each group, or use a laminated A2 size partograph, and the cases. Ask the participants to plot the case information AND add the necessary information showing a normal FHR every 30 minutes, contractions per 10 minutes every 30 minutes and a normal maternal pulse every 30 minutes on the partograph. The group participants should discuss whether the management of the case was correct, and present the completed partograph and their comments regarding case management to the rest of the group.

- After each presentation, ask the participants to evaluate whether the partograph was completed correctly and discuss the comments regarding the management of the case.
Case study 4

Galina V. Second pregnancy, a history of 1 birth. Delivery record file # 802, admitted on 04.05 at 18:00

18:00
Fetal heart rate – 140 beats /min
Amniotic fluid – intact
Head moulding - no
Cervical dilatation – 4 cm
Head descent – 4/5
Contractions in 10 min – 3 contractions of 35 sec.
Blood pressure – 110/65
Pulse - 68 beats /min
Temperature – 36.7 °C
Urine – 120 ml

Fetal heart rate
18:30 - 140 beats / min,
19:00 - 150 beats / min,
19:30 - 150 beats / min,
20:00 - 140 beats / min,
20:30 - 140 beats / min,
21:00 - 130 beats / min,
21:30 - 150 beats / min,

Contractions per 10 minutes
18:30 - 3 contractions each lasts 35 seconds,
19:00 - 3 contractions each lasts 35 seconds,
19:30 - 3 contractions each lasts 35 seconds,
20:00 - 3 contractions each lasts 40 seconds,
20:30 - 3 contractions each lasts 40 seconds,
21:00 - 3 contractions each lasts 40 seconds
21:30 - 3 contractions each lasts 35 seconds

Pulse
18:30 - 80 beats / min,
19:00 - 80 beats / min,
19:30 - 90 beats / min,
20:00 - 90 beats / min,
20:30 - 90 beats / min,
21:00 - 80 beats / min,
21:30 - 80 beats / min,

22:00
Fetal heart rate – 132 beats /min
Amniotic fluid – intact
Head moulding – no
Cervical dilatation – 7 cm
Head descent – 3/5
Contractions in 10 min – 3 contractions of 35 sec.
Blood pressure – 115/70
Pulse - 74 beats /min
Temperature – 36.8 °C
Urine – 80 ml
Fetal heart rate
18:30 - 148 beats / min,
19:00 - 130 beats / min,
19:30 - 130 beats / min,
20:00 - 140 beats / min,
20:30 - 140 beats / min,
21:00 - 130 beats / min,
21:30 - 150 beats / min,

Contraction per 10 minutes
18:30 - 3 contractions each lasts 35 seconds,
19:00 - 3 contractions each lasts 35 seconds,
19:30 - 3 contractions each lasts 35 seconds,
20:00 - 3 contractions each lasts 40 seconds,
20:30 - 3 contractions each lasts 40 seconds,
21:00 - 3 contractions each lasts 40 seconds,
21:30 - 2 contractions each lasts 40 seconds,

Pulse
18:30 - 80 beats / min,
19:00 - 80 beats / min,
19:30 - 90 beats / min,
20:00 - 90 beats / min,
20:30 - 90 beats / min,
21:00 - 80 beats / min,
21:30 - 80 beats / min,

02:00
Fetal heart rate – 130 beats /min
Amniotic fluid – spontaneous rupture. clear
Head moulding – no
Cervical dilation – 8 cm
Head descent – 3/5
Contraction in 10 min – 2 contractions of 35-40 sec.
Blood pressure – 120/80
Pulse – 92 beats /min
Urine – 70 ml
Oxytocin infusion started, 10 U/L; 2 drops = 1milliunits per minute

Delivery – 03:45
A live boy
Weight – 3200
Length – 55 cm
Apgar – 6/7 points

- Possible answer for Case 4
- In this case, the progress of labour is unsatisfactory: contractions last less than 40 seconds; dilatation progress from 18.00 to 22.00 was less than 1 cm per hour. Why was the progress slow? Consider the contraction pattern, the position of the fetus, the psychological state of the woman, the size of the fetus, the size of the pelvis. Options at 22:00 might have been upright position with partner, positions to facilitate rotation if the fetus is in a posterior or transverse position, oral fluids, shower, listening to the woman’s perceptions of labour. These activities may facilitate the labour
progress. Another option at 22:00 is an amniotomy. The risks and benefits of these options should be discussed with the woman. If an amniotomy is performed and if contractions did not increase in one hour (3-4 contractions in 10 minutes, each lasting more than 40 seconds), oxytocin infusion should have been started AT 1 MLIUNITS PER MINUTE. At examination at 02:00 the Action Line was reached (high risk of neonatal resuscitation and intranatal death), and oxytocin infusion was obviously started too late. This example shows how a partograph can detect an unsatisfactory labour early and guide the staff to take the appropriate action in time.

Case study 5

Iryna P. Second pregnancy, a history of 1 vaginal birth (boy, 3600 g). Birth record file # 510, admitted on 02.06 at 06:00

06:00
Fetal heart rate – 136 beats / min
Amniotic fluid – clear (membrane rupture at 04:00)
Head moulding - no
Cervical dilatation – 4 cm
Head descent – 4/5
Contractions in 10 min – 3 contractions 40 seconds
Blood pressure – 115/75
Pulse – 70 beats /min
Temperature – 36.7 ºC
Urine – 120 ml

Fetal heart rate
06:30 - 138 beats / min,
07:00 - 150 beats / min,
07:30 - 150 beats / min,
08:00 - 140 beats / min,
08:30 - 140 beats / min,
09:00 - 130 beats / min,
09:30 - 140 beats / min,

Contractions per 10 minutes
06:30 - 3 contractions each lasts 40 seconds,
07:00 - 3 contractions each lasts 40 seconds,
07:30 - 3 contractions each lasts 40 seconds,
08:00 - 3 contractions each lasts 45 seconds,
08:30 - 3 contractions each lasts 45 seconds,
09:00 - 4 contractions each lasts 45 seconds
09:30 - 4 contractions each lasts 45 seconds

Pulse
06:30 - 80 beats / min,
07:00 - 80 beats / min,
07:30 - 90 beats / min,
08:00 - 90 beats / min,
08:30 - 90 beats / min,
09:00 - 80 beats / min,
09:30 - 80 beats / min,
10:00
Fetal heart rate – 140 beats / min
Amniotic fluid – clear
Head moulding – the bones slightly adjoin
Cervical dilatation – 8 cm
Head descent – 3/5
Contractions in 10 min – 4 contractions of 50 – 55 seconds
Blood pressure – 115/80
Pulse – 84 beats/min
Temperature – 36.6 ºC
Urine – 100 ml

Fetal heart rate
10:30 - 130 beats / min,
11:00 - 140 beats / min,
11:30 - 140 beats / min,

Contractions per 10 minutes
10:30 - 3 contractions each lasts 45 seconds,
11:00 - 4 contractions each lasts 55 seconds,
11:30 - 4 contractions each lasts 65 seconds,

Pulse
10:30 - 80 beats / min,
11:00 - 90 beats / min,
11:30 - 100 beats / min,

12:00
Fetal heart rate – 130 beats/min
Amniotic fluid – meconium-stained
Head moulding – the bones severely overlap
Cervical dilatation – 8 cm
Head descent – 3/5
Contractions in 10 min – 4 contractions of 55 – 65 seconds, painful
Blood pressure – 140/90
Pulse – 100 beats /min
Temperature – 36.7 ºC
Urine – no spontaneous urination, catheterization failed

Caesarean delivery – 12:15
Alive girl
Weight – 4200
Length – 52 cm
Apgar – 7/8 points

• Possible answer for Case 5
  o Why was the progress slow? Consider the contraction pattern, the position of the foetus, the psychological state of the woman, the size of the foetus, the size of the pelvis.
  o The partograph obviously shows the signs of cephalopelvic disproportion at 12:00: no head descent with 3rd degree moulding and active labour. C-section was performed due to cephalopelvic disproportion (CPD), a large baby was delivered.
Case study 6

Elena P., Third pregnancy, no history of birth. Birth record file # 612, admitted on 02.02 at 07:00

07:00
  Fetal heart rate - 140 beats/min
  Amniotic fluid – intact
  Head moulding – no
  Cervical dilatation – 1 cm, cervical length 2 cm (50% effacement)
  Head descent – 5/5
  Contraction in 10 min - 2 contractions of 20 to 25 seconds
  Blood pressure – 130/80
  Pulse – 72 beats/min
  Temperature – 36.8 ºC
  Urine – 70 ml

Fetal heart rate
  07:30 - 138 beats / min,
  08:00 - 150 beats / min,
  08:30 - 150 beats / min,
  09:00 - 140 beats / min,
  00:30 - 140 beats / min,
  10:00 - 130 beats / min,
  10:30 - 140 beats / min,

Contractions per 10 minutes
  07:30 - 2 contractions each lasts 25 seconds,
  08:00 - 2 contractions each lasts 25 seconds,
  08:30 - 2 contractions each lasts 25 seconds,
  09:00 - 2 contractions each lasts 30 seconds,
  00:30 - 2 contractions each lasts 30 seconds,
  10:00 - 2 contractions each lasts 30 seconds
  10:30 - 2 contractions each lasts 30 seconds

Pulse
  07:30 - 80 beats / min,
  08:00 - 80 beats / min,
  08:30 - 70 beats / min,
  09:00 - 70 beats / min,
  09:30 - 70 beats / min,
  10:00 - 80 beats / min,
  10:30 - 70 beats / min,

11:00
  Fetal heart rate - 136 beats /min
  Amniotic fluid – intact
  Head moulding – no
  Cervical dilatation – 2 cm, cervical length 1 cm (75% effacement)
  Head descent – 4/5
  Contraction in 10 min - 2 contractions of 25 to 30 seconds
  Blood pressure – 130/80
  Pulse – 74 beats/min
  Temperature – 36.7 ºC
  Urine – 110 ml
Fetal heart rate
11:30 - 138 beats / min,
12:00 - 150 beats / min,
12:30 - 150 beats / min,
13:00 - 140 beats / min,
13:30 - 140 beats / min,
14:00 - 130 beats / min,
14:30 - 140 beats / min,

Contractions per 10 minutes
11:30 - 2 contractions each lasts 25 seconds,
12:00 - 2 contractions each lasts 25 seconds,
12:30 - 2 contractions each lasts 30 seconds,
13:00 - 2 contractions each lasts 35 seconds,
13:30 - 2 contractions each lasts 35 seconds,
14:00 - 2 contractions each lasts 25 seconds,
14:30 - 2 contractions each lasts 30 seconds,

Pulse
11:30 - 80 beats / min,
12:00 - 70 beats / min,
12:30 - 80 beats / min,
13:00 - 80 beats / min,
13:30 - 70 beats / min,
14:00 - 80 beats / min,
14:30 - 70 beats / min,

15:00
Fetal heart rate - 130 beats/min
Amniotic fluid – intact
Head moulding – no
Cervical dilatation – 2 – 2.5 cm, cervical length 0.5 cm (>75% effacement)
Head descent – 4/5
Contractions in 10 min - 2 contractions of 25 to 30 seconds
Blood pressure – 130/80
Pulse – 74 beats/min
Temperature – 36.6 ºC
Urine – 120 ml

• Possible answer for Case 6
  o In this case, the latent phase of labour is prolonged. The dynamic structural changes of the cervix are evidence contradicting the diagnosis of false labour pains. However there is more than one way to manage the care for this woman.
  o Ask the participants how they manage such women in their maternities? Why was this woman admitted at 07:00? What was the indication? Unless this woman or her fetus is exhibiting signs of complications, she should be sent home with instructions of when to return to the hospital. Misdiagnosing false labour or prolonged latent phase leads to unnecessary induction or augmentation, which may fail. This may lead to unnecessary caesarean section and amnionitis.
  o Remind them of tactics recommended by the WHO to manage a prolonged latent phase,:
- If the latent phase lasts 8 hours and more, with no signs of labour advancing, the woman should be examined again for cervical dilatation.

- If no structural changes (effacement and dilatation) and no foetal distress is identified, the diagnosis should be revised. It is likely labour has not started.

- If structural changes are present (effacement or dilatation), discuss the risks and benefits of AROM and oxytocin augmentation with the woman. If the woman agrees with intervention, rupture the membranes with amniotic hook or Kocher’s tweezers and note the colour of the fluid and listen to the FHR. Record the information on the partograph. If the contraction pattern is not increased in one hour, stimulate the labour with oxytocin OR begin oxytocin immediately after AROM. Discuss the options with the woman.
  - Reassess the woman every 4 hours
  - If the woman has not entered the active phase after 8 hours of oxytocin infusion, a caesarean section is indicated

- Discuss the importance of correctly using and interpreting the partograph

**During the clinical week, you will be able to:**

- Use the partograph when labour is managed by the group on duty.

- Analyse the partograph at morning staff meetings (filling-in, assessment of the progress of labour)

- Use birth record files from the archive of this maternity to review clinical cases and audit the actions of the staff (prolonged latent phase, labour induction and augmentation)
References


Module 3MO

Hypertension in Pregnancy

Learning objectives

- To learn international criteria of diagnosis and classification of hypertensive disorders in pregnancy
- To be able to use evidence based management of hypertensive disorders in pregnancy
- To be aware of the danger of over-diagnosis and over-treatment of hypertensive disorders in pregnant women
- To acknowledge risks associated with intubation and fluid overload in patients with severe pre-eclampsia

Module outline and length

Part I – Classroom work - 90 min
Activity 1 – Introduction 5 min  
Activity 2 – Small group work 20 min  
Activity 3 – Interactive presentation 40 min  
Activity 4 – Discussion of cases 20 min  
Activity 5 – Conclusions 5 min

Part II – Clinical work – 60 min
Activity 6 – Management of severe pre-eclampsia and postoperative period in women with severe pre-eclampsia/eclampsia 60 min

Preparation for the module

- Review current publications and evidence based materials regarding hypertensive disorders during pregnancy
- Ensure that all participants have Participant Manual
- Ensure that case studies with clear descriptions are prepared.
Materials and Audiovisual Equipment

**Materials**
- Participant Manual
- Case studies for small group work

**Equipment**
- Video projector or projector overhead
- Flipchart
- Felt pens
- Pens and pencils

Key Messages

- Pre-eclampsia cannot be prevented and there is no effective treatment method for this condition.
- The only effective treatment method for pre-eclampsia is delivery.
- Management of severe pre-eclampsia and impending eclampsia includes control of blood pressure, the prevention of convulsions and delivery.
- Currently magnesium sulphate is the drug of choice for treatment of eclampsia; it is also effective and should be used in case of severe pre-eclampsia.
- Prolongation of pregnancy in case of severe pre-eclampsia is acceptable only in selected cases for the interest of the preterm foetus.
- Over-diagnosis and over-treatment of pre-eclampsia can be dangerous for mother and foetus, therefore:
  - Strict criteria should be used for diagnosis. Hypertension and proteinuria are very important signs of pre-eclampsia; oedema is not a useful criteria to diagnose pre-eclampsia; strict rules of blood pressure measurement should be followed.
  - Use of diuretics, a very pronounced decrease of blood pressure, excessive intravenous infusion or sedation may precipitate serious complications in mother and foetus and should be avoided.
- Eclampsia / severe pre-eclampsia are not themselves indications for immediate caesarean section. It is recommended to stabilize the patient and only after that should delivery be expedited.
- The main causes of death in pre-eclampsia are intracerebral haemorrhages caused mainly by inadequate control of blood pressure, and pulmonary complications, a consequence of excessive infusions after delivery and complications of tracheal intubation / extubation.
Key Messages

- Strict control of blood pressure, prevention of seizures by use of magnesium sulphate and limitation of fluid therapy are the cornerstones of management aimed to prevent postpartum complications of severe pre-eclampsia.

Part I - Classroom work

Activity 1 – Introduction (5 min)

- Show Slide 3MO-1 and explain that while working on this module, the participants will discuss modern strategies of hypertensive disorders management in pregnancy.

- Explain that this module consists of two parts: Part 1 is Classroom work, which includes small group work (case studies), interactive presentation and re-discussion of case studies. Part II will be conducted during the clinical week.

- Present learning objectives to participants:
  - To learn international diagnostic and classification criteria for hypertensive disorders in pregnancy
  - To be able to use evidence based management of hypertensive disorders in pregnancy
  - To realize the danger of over-diagnosis and over-treatment of hypertensive disorders in pregnant women
  - To acknowledge the risks associated with intubation and fluid overload in patients with severe pre-eclampsia

- Use Slides 3MO-2 and 3MO-3 to present the importance of the problem and the impact of hypertensive disorders on pregnancy outcomes.

Activity 2 – Small group work (20 min)

- Divide participants into 4 groups. Give one case study printed on a sheet of paper to each group.

Case study 1

Tatiana, a 30 year old woman, is pregnant for the first time. The gestational age of pregnancy is 36 weeks. Her blood pressure is 130/85 mm Hg. At the first visit her blood pressure is 100/70 mm Hg. She has oedema of the legs; her weight gain during this pregnancy is 18 kg. Urine proteins constitute 0.15 g/l. Symphysis - fundus height is 34 cm.

Case study 2
Rita is 22 years old. The gestational age of her pregnancy is 36 weeks. She has no complaints. Moderate oedema of legs is observed. Blood pressure is 150/100 mm Hg. Urine protein constitute – 0.1 g/l. Rita feels the foetal movements well. Symphysis - fundus distance is 34 cm.

Case study 3

Svetlana is 31 years old. The gestational age of her pregnancy is 31 weeks. She has no complaints. Blood pressure is 150/100 mm Hg. Urine protein constitutes 0.5 g/l. Symphysis - fundus distance is 29 cm.

Case study 4

Alena is 20 years old. The gestational age of her pregnancy is 34 weeks. Alena complains about headache, nausea, epigastria pain. Her blood pressure is 180/110 mm Hg. Urine protein constitutes 1.0 g/l. She notes that the foetus moves slowly.

- Ask the participants from each group to discuss their case study during 10 minutes and answer the following questions:
  - What is the diagnosis in this woman? Justify your answer.
  - Which tests should be performed to confirm the diagnosis?
  - How should this case be managed?

- Ask participants to write their conclusions on the flipchart. Then one participant from each group should present the results of the small group work to the other participants. Ask the participants to justify briefly the proposed actions.

- Do not make comments on participants’ presentations. Ask several questions to participants for clarification, if needed. Explain that after the presentation you will come back to the cases and discuss them in detail.

Activity 3 – Interactive presentation (40 min)

- Start your presentation by showing the Slide 3MO-2 with the list of hypertensive disorders in pregnancy which will be discussed in detail during this presentation. Tell participants that WHO lists the following as hypertensive disorders of pregnancy (International Classification of Diseases, 10th Edition, 1990):
  - Hypertension during pregnancy may develop as a result of the pregnancy or follow pre-existing hypertension (either essential or secondary). Hypertension arising for the first time after 20 weeks gestation may be an isolated finding, i.e., gestational hypertension, or part of a multisystem disorder, i.e. pre-eclampsia.

- Go to Slide 3MO-3 and present diagnostic criteria of hypertension and severe hypertension. Tell participants that as of today, there is less agreement about the degree of moderate hypertension.

- Show Slide 3MO-4 and explain to participants that hypertension alone has little risk for the mother or the foetus. Stress that antihypertensive treatment has only one aim: to prevent the development of severe hypertensive disease.
and should be administered as dictated by the blood pressure. If needed, such patients should receive outpatient treatment.

- Also stress that level of blood pressure is influenced by many factors and should be measured in a manner that reduces the likelihood of mistake. It is important to standardize methods of blood pressure assessment with the woman in the appropriate position.

- Explain to participants that the measurement of blood pressure in pregnancy and pre-eclampsia should include the following:
  - Instrument: mercury/aneroid sphygmomanometer or validated automated device
  - Cuff size: it is imperative that the appropriate cuff size is used; it is better to use one that is too big rather than one that is too small
  - Setting: relaxed, quiet environment, preferably after rest
  - Position: lying at a 45-degree angle or sitting (cuff at heart level)
  - Arm: left or right (higher value if difference is greater than 10 mmHg)
  - Korotkov sounds: first (systolic) and fifth (diastolic); if diastolic is persistently less than 40 mmHg use muffling or fourth sound and make a note.

- Display Slides 3MO-5 – 3MO-6. When you show Slide 3MO-5, initially you will show only the title of the slide. Ask participants to tell you: what in their opinion is pregnancy-induced hypertension? Listen carefully to all their opinions and afterwards (press the button to continue the slide presentation) show them the definition of pregnancy-induced hypertension Recommended by the Council of the Australasian Society for the Study of Hypertension in Pregnancy in 2000. Go to Slide 3MO-6 and stress that this condition only, has little risk for the mother or the foetus. Emphasise that in those cases when proteinuria develops in addition to hypertension in pregnancy, the risk for both mother and foetus are substantially increased. Admission to hospital is then considered necessary. Hospitalization, bed-rest and use of diuretics are not proved and thus not recommended.

- Go to Slide 3MO-7 and explain that antihypertensive therapy of the mild or moderate pregnancy-induced hypertension prevents the development of severe hypertension only. There is no clear evidence that antihypertensive treatment with any of the drugs available may defer or prevent the occurrence of proteinuric pre-eclampsia or of associated problems, such as foetal growth restriction and neonatal morbidity. Nor is there good evidence about the safety of such treatments, in particular with respect to child development.

- Show Slide 3MO-8 and explain that pre-eclampsia is one of the most dangerous complications of the pregnancy and present the data associated with pre-eclampsia.

- Showing Slide 3MO-9 give the definitions of pre-eclampsia and severe pre-eclampsia recommended by the Royal College of Obstetricians and Gynaecologists. Emphasize that severe pre-eclampsia is a life threatening stage of the disease and should be considered an obstetric emergency. In rare cases, signs and symptoms of severe pre-eclampsia may develop in the absence of very high blood pressure or proteinuria, especially when women are treated with antihypertensive drugs.
Go to Slide 3MO-10 and explain that for a diagnosis of pre-eclampsia the strict criteria for diagnosis should be used. Classification of severity is primarily based on the level of blood pressure and the presence of proteinuria. Present the criteria of proteinuria (Slide 3MO-11). Emphasize that the usual proteinuria screening test is visual dipstick assessment. A two plus dipstick measurement can be taken as evidence of proteinuria but ideally a more accurate test (either a spot protein creatinine ratio or ideally a 24-hour urine collection) is required to confirm this. Present Slide 3MO-12 and stress that oedema is no longer the diagnostic criteria. Increasing oedema by itself, is not a sign that should determine management.

Explain that for years health care workers tried to use different approaches:
1. Preventing development of pre-eclampsia in the general population of pregnant women or in high risk groups
2. Detecting the condition at an early stage
3. Treating the disease at an early stage to prevent progression to advanced stage and the development of complications.

Ask the participants how effective the mentioned approaches are. Stress that one of the most important goals of these measures should be decreasing perinatal mortality and morbidity.

Show Slide 3MO-13 which presents evidence of effectiveness of antiplatelet drugs and calcium supplement for prevention of pre-eclampsia in high risk groups. Stress that aspirin has a moderate effect in prevention of pre-eclampsia and is recommended only to pregnant women with high risk factors such as chronic hypertension or antiphospholipid syndrome. Calcium supplementation is recommended for prevention of pre-eclampsia only in women at high risk of hypertension in pregnancy and those women with low dietary calcium.

Show Slide 3MO-14 and explain that the listed methods are ineffective for pre-eclampsia prevention.

Discuss with the participants how to monitor women with severe pre-eclampsia (showing Slide 3MO-15) and emphasize that the blood pressure should be checked every 15 minutes until the woman is stabilized, and then every 30 minutes in the initial phase of assessment. The blood pressure should be checked every 4 hours if a conservative management plan is in place and the woman is stable and asymptomatic. Then go to Slide 3MO-16 and present how to assess the foetus. Stress that in the acute setting, an initial assessment with cardiotocography should be undertaken. This gives information about fetal wellbeing at that time but does not give any predictive information. Women in labour with severe pre-eclampsia should have continuous electronic fetal monitoring. If conservative management is planned, then further assessment of the fetus with ultrasound measurements of fetal size, umbilical artery Doppler and amniotic fluid volume should be undertaken. Serial assessment will allow timing of delivery to be optimised. The value of Doppler in other fetal blood vessels has yet to be clarified.

Show Slide 3MO-17 presenting the main symptoms of women with severe pre-eclampsia. Stress that the management of severe pre-eclampsia is based on careful assessment, stabilization, continued monitoring and delivery at the optimal time for the mother and her baby.
Emphasize that senior obstetric and anaesthesia staff and experienced midwives should be involved. Controlling blood pressure, although not treating the cause of pre-eclampsia, may reduce the severity of complications of severe pre-eclampsia.

Note that prolongation of pregnancy in severe pre-eclampsia may increase the incidence of maternal complications.

Show Slide 3MO-18 (initially show only the title of the slide). Ask participants: when in their opinion, should the antihypertensive treatment be started? Listen carefully all their opinions and afterwards (press the button continuing the slide presentation) show them, one-by-one, three main indications for starting antihypertensive therapy. After the last one, a fourth bullet point will appear (in red) with the very important statement that if blood pressure is below 160/100 mmHg, there is no immediate need for antihypertensive therapy. Discuss all these statements with participants in detail and ensure that they understand every statement correctly and agree with all of them.

Show Slides 3MO-19 - 3MO-21 which present information on drugs recommended for antihypertensive therapy. When showing Slide 3MO-19 please note that Hydralazine and IV Labetalol are not available in most NIS countries, whereas the interaction of Nifedipine and magnesium sulphate may produce serious complications. So, other potential antihypertensive drugs such as sodium nitroprusside (or Isoket) should be available and used in refractory cases.

Agents for long term control of blood pressure must be effective and safe for the foetus. Methylldopa is preferred by many physicians as first-line therapy (Slide 3MO-20).

Showing Slide 3MO-21 emphasize that atenolol is associated with an increase in fetal growth restriction. ACE inhibitors and ARBs would appear to be contraindicated because of unacceptable fetal adverse effects (foetal growth retardation, oligohydramnion, neonatal renal failure, and neonatal death). Diuretics are relatively contraindicated for hypertension and should be reserved for pulmonary oedema.

Go to Slide 3MO-22 and present the effectiveness of Magnesium sulphate in the prevention of seizures. Emphasize that magnesium sulphate should be considered for women with pre-eclampsia for whom there is concern about the risk of eclampsia. This is usually in the context of severe pre-eclampsia once a delivery decision has been made and in the immediate postpartum period. In women with less severe disease the decision is less clear and will depend on individual case assessment.

Stress that more women need to be treated with magnesium sulphate when pre-eclampsia is not severe to prevent one seizure when compared with severe pre-eclampsia. When conservative management of a woman with severe hypertension and a premature foetus is made, it would be reasonable not to treat until the decision to deliver has been made.

Showing Slide 3MO-23 say that the RCT “MAGPIE” is the biggest trial (conducted in 33 countries and included 10,141 women) to study the
preventive use of magnesium sulphate in case of pre-eclampsia and showed a 58% decrease in the risk of eclampsia, as well as other benefits associated with magnesium sulphate, such as decreasing the risk of maternal mortality and placental abruption.

- **Slides 3MO-24 and 3MO-25** give information about two regimens of magnesium therapy and control of this treatment.

- Show **Slide 3MO-26** and stress that eclampsia is a relatively rare but serious complication of pregnancy. For example, in the UK, around 5 out of 10,000 pregnant woman suffer from eclampsia. In eclampsia, the case fatality rate has been reported as 1.8%, and a further 35% of women experience a major complication.

- Display **Slide 3MO-27** and explain that magnesium sulphate is the therapy of choice to control seizures. A loading dose of 4 g should be given by infusion pump over 5–10 minutes, followed by a further infusion of 1 g/hour maintained for 24 hours after the last seizure. (Evidence level A).

- Stress that in cases of eclampsia never leave a woman alone.

- Go to **Slide 3MO-28** and indicate that recurrent seizures should be treated with either a further bolus of 2 g magnesium sulphate or an increase in the infusion rate to 1.5 g or 2.0 g/hour. (Evidence level A).

- Note, that if the woman enters the coma stage, ensure she is on her left side with head slightly extended to maintain airway permeability.

- Show **Slide 3MO-29** and explain that fluid restriction is advisable to reduce the risk of fluid overload in the intrapartum and postpartum periods. In usual circumstances, total fluids should be limited to 80 ml/hour or 1 ml/kg/hour. Intravascular volume expansion carries a serious risk of volume overload, which may lead to pulmonary and perhaps cerebral oedema in preeclamptic women in whom colloid osmotic pressure is usually low. Plasma volume expansion may be particularly dangerous after birth, when venous volume tends to rise. It should not be applied without careful monitoring. Also, the choice of agent may have a major impact on outcome. Recently it has become clear that for critically ill people plasma expansion with colloid is associated with a higher mortality than either not using any plasma expander or expansion with crystalloid.

- Stress that the only definitive treatment of pre-eclampsia is delivery at optimal time for mother and foetus by showing **Slide 3MO-30** (initially only the slide title will be shown). Press the button continuing the slide presentation and display the first of two statements and explain that the delivery should be well planned, done on the best day, performed in the best place, by the best route and with the best support team. A few hours’ delay in delivery may be helpful if it allows the neonatal unit to be more organized or allows transfer of a mother to a place where a cot is available. This assumes the mother is stable before delivery and prior to transfer. Ask the participants: if termination of pregnancy is a definitive treatment of pre-eclampsia why continue the pregnancy? Listen carefully all their opinions and afterwards (press the button to continue the slide presentation) and show them the second statement on the slide. Explain
that the only reason to prolong pregnancy in cases of pre-eclampsia is to increase chances of foetal survival.

- Go to Slide 3MO-31 and explain that if the gestation is less than 34 weeks and the pregnancy can be prolonged in excess of 24 hours, steroids help to reduce foetal respiratory mortality. There is probable benefit from steroid therapy even if delivery is less than 24 hours after administration. Prolonging the pregnancy at very early gestations may improve the outcome for the premature infant but can only be considered if the mother remains stable. Stress that there is no sense to prolong pregnancy in case of foetus distress since the foetus may die in utero.

- Show Slide 3MO-32 with indications for delivery in pre-eclampsia. Emphasize that delivery at optimal time for mother and foetus is the only effective treatment for pre-eclampsia. If the gestation is greater than 34 weeks, delivery after stabilisation is recommended. Delivery usually has advantages for both mother and baby unless the baby is very premature.

- Stress that if the complications of pre-eclampsia are threatening the life of the mother there is no choice, even if immediate delivery means chances of the baby’s survival are low.

- The mode of delivery should be determined after considering the presentation of the foetus and the foetal condition, together with the likelihood of success of induction of labour after assessment of the cervix.

- Explain to participants the main principles of management of the preeclamptic women after delivery showing Slide 3MO-33. Note that Clinicians should be aware of the risk of late seizures and ensure that women have a careful review before discharge from hospital. Anti-hypertensive medication should be continued after delivery as dictated by the blood pressure. It may be necessary to maintain treatment for up to 3 months, although most women can have treatment stopped before this. Women with persisting hypertension and proteinuria at 6 weeks may have renal disease and should be considered for further investigation. Clinicians should also be aware that up to 44% of eclampsia occurs postpartum, especially at term, so women with signs or symptoms compatible with pre-eclampsia should be carefully assessed.

- Summarize using Slides 3MO-34 and 3MO-35.

- Ask the participants if they have any questions. Answer their questions.

**Activity 4 – Discussion of cases (20 min)**

- Explain that the aim of this activity is to re-define diagnosis and management of each case discussed during small group work (Activity 2) according to contemporaneous recommendations.

- Take the cases written on the flipchart during Activity 2 one by one, and ask the participants from each small group to make appropriate changes in management.

- Ensure that participants come to the conclusions presented below. Make the necessary comments.
Case study 1
✓ This is an uncomplicated pregnancy
✓ Absolute figures of blood pressure are considered criteria of hypertension, not relative increase (in 73% of pregnancies diastolic blood pressure increase more than by 15 mm Hg)
✓ Weight gain is not a diagnostic criteria of pre-eclampsia
✓ Proteinuria is considered a protein loss of more than 0,3 g/day

Case study 2
✓ This is gestational hypertension (if the same blood pressure level or more than 140/90 will be observed after 4 hours)
✓ Oedema is not a diagnostic criteria of pre-eclampsia
✓ Subsequent management consists of careful monitoring of mother and foetal status
✓ No treatment is necessary in this case.

Case study 3
✓ Non-severe pre-eclampsia (hypertension + proteinuria)
✓ Admission to hospital may be required (for careful monitoring, not treatment)
✓ If progression to severe pre-eclampsia is suspected, which could required preterm delivery, corticosteroids should be use for RDS prophylaxis
✓ Methods of foetal monitoring might be discussed

Case study 4
✓ Severe pre-eclampsia
✓ Management consists of antihypertensive treatment, prevention of convulsions (eclampsia) with magnesium sulphate and delivery.
✓ Vaginal delivery may be considered, under careful and continuous monitoring of mother and foetus
✓ Caesarean section would be an option in case of unsuccessful induction, inadequate progress of labour, or threatening condition of mother or foetus

• This recommendation can provoke questions in the participants. Explain aspects of management of severe pre-eclampsia / eclampsia, appropriate modes of delivery and specificity of postoperative period management will be discussed during the clinical week.

• Ask the participants if they have any questions. Answer their questions.

Activity 5 – Conclusions (5 min)

• Split the participants in pairs. Explain that each pair should find one difference, which they consider relevant to their practice, between current, local management of pre-eclampsia and recommendations presented during this module.

• Write these differences on the flipchart.
PART II – Clinical work

Activity 6 – Management of severe pre-eclampsia and postoperative period in women with severe pre-eclampsia/eclampsia (60 min)

- Show Slide 3MO-36 and explain that during this part of the module the general principles of severe pre-eclampsia treatment, safest modes of delivery and anaesthesia, postoperative period management in women with severe pre-eclampsia/eclampsia will be discussed.

- Ask the participants to list the main causes of death among women with pre-eclampsia and eclampsia. Do they have any statistical data on maternal mortality in their regions?

- Show Slide 3MO-37: the main causes of maternal death from pre-eclampsia in Great Britain (1988-1990). Draw participants’ attention to the fact that the main causes of maternal death are cerebral complications and pulmonary disorders. Ask them which factors lead to development of these complications (inadequate blood pressure control and replacement of too much fluids volume) and when the risk of these complications is highest (in caesarean section with intubational narcosis).

- Show Slide 3MO-38 and discuss the dangers and difficulties, which can arise during caesarean section with general anaesthesia. Stress the sharp increase in blood pressure and pulmonary vessel pressure at the moment of intubation and extubation/aspiration using the graph on Slide 3MO-39. Note the pressure effect in case of regional anaesthesia use (Slide 3MO-40).

- Discuss with the participants the following aspect: what is safer for a woman with severe pre-eclampsia: immediate Caesarean section under general anaesthesia when her blood pressure is very high, or delivery (vaginal or caesarean section) after stabilization of her condition (decreasing of BP, convulsions control, hypoxia correction)?

- Show Slides 3MO-41 and 3MO-42 and note that immediate Caesarean section is not only contraindicated, but even dangerous, if the condition of the patient is not stable or just after the eclampsia seizure.

- Slide 3MO-43 gives information of the main complications, which can develop in women with severe pre-eclampsia/eclampsia. Note the very high risk of eclampsia, and the fact that in majority of cases, pulmonary oedema develops after delivery. List the basic mechanisms, which cause pulmonary oedema just after delivery/caesarean section.
• One of the main factors increasing the risk of pulmonary oedema just after delivery / Caesarean section is iatrogenic fluid overload in case of so called “infusion therapy” in pre-eclampsia (Slide 3MO-44). That is why the volume of infusion in women with pre-eclampsia should be strictly limited: the volume must not exceed 80 ml per hour in case of adequately replaced volume of blood loss during the Caesarean section.

• Make conclusions on postoperative period management in women with severe pre-eclampsia using Slide 3MO-45: it is necessary to continue the magnesium sulphate treatment to decrease the risk of eclampsia, maintain strict control of blood pressure and limit fluid intake (because of the risk of pulmonary oedema). These recommendations are also valid for women, who delivered vaginally.
References


Activity 2

Group 1

Tatiana a 30 year old woman and pregnant for the first time. The gestational age of her pregnancy is 36 weeks. Her blood pressure is 130/85 mm Hg. At the first visit her blood pressure was 100/70 mm Hg. She has oedema in her legs; weight gain during this pregnancy is 18 kg. Urine proteins constitute – 0.15 g/l. Symphysis - fundus distance is 34 cm.

Questions for discussion:

1. What is the diagnosis in this woman? Justify your answer.
2. Which tests should be done to confirm the diagnosis?
3. What is the best way to manage this case?

Group 2

Rita is 22 year old. The gestational age of her pregnancy is 36 weeks. She has no complaints. Moderate oedema of the legs is observed. Blood pressure is 150/100 mm Hg. Urine protein constitute – 0.1 g/l. Rita feels the foetal movements well. Symphysis - fundus distance is 34 cm.

Questions for discussion:

1. What is the diagnosis in this woman? Justify your answer.
2. Which tests should be done to confirm the diagnosis?
3. What is the best way to manage this case?
Group 3

Svetlana is 31 years old. The gestational age of her pregnancy is 31 weeks. She has no complaints. Blood pressure is 150/100 mm Hg. Urine protein constitute – 0.5 g/l. Symphysis - fundus distance is 29 cm.

Questions for discussion:

1. What is the diagnosis in this woman? Justify your answer.
2. Which tests should be done to confirm the diagnosis?
3. What is the best way to manage this case?

Group 4

Alena is 20 years old. The gestational age of her pregnancy is 34 weeks. Alena complains about headache, nausea, epigastric pain. Her blood pressure is 180/110 mm Hg. Urine protein constitutes 1.0 g/l. She notes that the foetus moves slowly.

Questions for discussion:

1. What is the diagnosis in this woman? Justify your answer.
2. Which tests should be done to confirm the diagnosis?
3. What is the best way to manage of this case?
Module 4MO

Obstetrical Haemorrhages

Learning objectives

At the end of the module participants will:

- Understand the importance of active management of the third stage of labour in preventing postpartum haemorrhage
- Understand the steps to identify and initiate the early management of postpartum haemorrhage
- Be able to make decisions about comprehensive measures to stop bleeding and resuscitate the patient
- Understand that the basis of care for women with PPH is the timely and adequate replacement of blood loss to the circulatory system. Be able to critically consider the surgical methods of treatment for postpartum haemorrhage
- Understand the importance of appropriate local protocol for managing obstetrical haemorrhage and for conducting trainings on a regular basis

Module outline and duration:

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Preparation for the module

- Review current publications and evidence materials referred to in the management of postpartum haemorrhage
- Ensure that all participants have a Participant Manual

Materials and Audiovisual Equipment

Materials

- Participant Manual
- Power Point presentation 4MO EPC ENG
Materials and Audiovisual Equipment


Equipment

- Video projector or projector overhead
- Flipchart
- Markers
- Pens and pencils

Key Messages

- Active management of the third stage of labour is effective in the prevention of postpartum haemorrhage.
- Early recognition and initiation of measures to stop bleeding are the first-line in managing PPH.
- Each health facility should have a local clinical protocol for the prevention and treatment of PPH. This protocol should be based on national evidence-based guidelines.
- Oxytocin in doses up to 40 IU, as well as ergometrine and prostaglandins are effective in many refractory cases of uterine atony.
- External and internal bimanual compression of the uterus and compression of the aorta are the methods recommended for temporary control of atonic bleeding.
- Initial measures to stop bleeding and resuscitate the patient are effective in most cases of PPH. A midwife has the necessary skills to use these measures.
- Hysterectomy is not the only method for the complete arrest of bleeding. There are many other simpler, less traumatic but effective alternatives: direct intramyometrial injection of prostaglandin, bilateral ligation of uterine arteries, bilateral ligation of internal iliac arteries and compression uterine sutures.
- Uterine atony is a rare indication for hysterectomy. Removal of the uterus is indicated mostly in placenta increta, uterine rupture, haematoma of broad ligament and other cervical-uterine trauma.
- A total hysterectomy is not always necessary. Subtotal hysterectomy is the operation of choice in most instances of PPH requiring hysterectomy.
Key Messages

- There is no evidence that colloids for replacing blood loss are better than crystalloids in reducing maternal mortality.

- Blood transfusion is vital in the most severe cases of PPH. At the same time, inappropriate or over-use may lead to many complications. There should be very strict indications for red-cells and fresh-frozen plasma transfusion.

Activity 1 – Introduction (15 min)

- Show Slide 4MO-1 and explain that while working with this module the participants will discuss evidence based methods of treatment for postpartum haemorrhage.

- Discuss the magnitude of the problem using Slide 4MO-2.

- Underline the main difficulties of PPH management (Slide 4MO-3) and stress that underestimation of blood loss is one of the most important.

- Initiate a discussion with the participants by asking; what is the most relevant definition of PPH for clinical practice? (Slide 4MO-4). Haemodynamic response to haemorrhage is very individual, thus, in every blood loss suspected to be pathological, medical staff should proceed with the initial steps of resuscitation and bleeding control.

- Explain that the correct calculation of the total amount of blood loss is rather difficult but crucial. Show Slide 4MO-5 which presents the WHO definition of postpartum haemorrhage.

- Show Slides 4MO-6 and 4MO-7 and highlight the importance of postpartum haemorrhage prevention by implementation of the routine use of an active management of the third stage of labour.

- Discuss (briefly) consequences of severe blood loss and stress the importance of volume replacement therapy and the timely arrest of bleeding.

Activity 2 – Small group work (15 min)

- Divide participants into 5 groups: two groups of midwives, two groups of obstetricians and one mixed, consisting of midwives and obstetricians. In the case of a limited number of participants, the groups can be divided into 4 groups and combine the first two tasks.

- Give them clear flipcharts sheets and markers.

- Show Slide 4MO-8 with the tasks.

- Ask the first group of midwives to list the initial steps of managing early postpartum haemorrhage.
Ask the second group of midwives to present a complete list of procedures related to the arrest of bleeding before laparotomy, a procedure midwives can do.

Ask the participants from the third group to present indications and surgical methods for the complete arrest of bleeding.

Ask the fourth group to list the main rules and principles of volume replacement therapy and blood transfusion.

Give the fifth group (mixed) the task of distributing roles among group members in a case of severe PPH management. Participants of this group should imagine themselves on duty in maternity and describe the responsibilities of staff members caring for a woman with PPH.

Explain that all ideas should be listed on a flipchart and two participants from each group will present the results of small group work.

**Activity 3 – Presentations of groups work results and discussions (75 min)**

After the presentation done by the first group, show Slide 4MO-9. Stress that after recognition of PPH, each health professional should call for assistance and simultaneously initiate the following: interventions aimed to resuscitate, monitoring the patient, finding the source of bleeding and stopping the bleeding.

Note that timely action is very important. Show Slide 4MO-10. Explain that early recognition is a key point in timely initiation of care. Stress that it is more logical to initiate resuscitation and careful monitoring, and to be clinically vigilant in 10 cases of non-severe bleeding than it is to be late in one case of severe PPH (>1000 ml or with signs of shock).

Show Slide 4MO-11, and list the components of the initial assessment and care which should be provided immediately after detecting postpartum bleeding.

Show Slide 4MO-12, reminding participants what should be done to initiate resuscitation.

Show Slide 4MO-13 which are the main causes of PPH. Stress that the most common causes of PPH are uterine atony and genital tract lacerations. The more rare causes of PPH, such as placenta previa and accreta, uterine rupture and coagulation abnormalities, are more difficult to manage and are associated with much higher mortality.

Slide 4MO-14 lists measures to stop bleeding in case the placenta is not delivered.

Slide 4MO-15, when placenta is delivered but not complete.
• **Slide 4MO-16** when the placenta is delivered and complete (uterine atony and genital tract trauma). Stress that oxytocin in doses of up to 40 IU may be used in cases of severe uterine atony.

• Ask the participants from the first group to prioritize actions in case of recognition of early PPH.

• Ask the participants to make a calculation of the total amount of time necessary to perform initial steps to treat PPH. If procedures are done in correct order it takes not more than 5-7 minutes. Stress that most cases of PPH respond to these very simple methods of treatment.

• Ask midwives from the second group to present the list of procedures they are able to do in case of postpartum haemorrhage. This list should include: intravenous access, uterine massage, speculum examination and suture of lacerations, bladder catheterization, pulse and blood pressure measurement, manual removal of placenta, manual control of uterine cavity, bimanual compression of the uterus and use of uterotonics.

• Discuss with participants the management of uterine atony (**Slide 4MO-17**) and uterine atony unresponsive to oxytocin (**Slide 4MO-18**) by using methylergometrine and prostaglandins.

• Note the high success rate of ergot alkaloids (**Slide 4MO-19**) in haemorrhage cases refractory to oxytocin and prostaglandins (**Slides 4MO-20**).

• Draw the attention of participants to the disadvantages (**Slide 4MO-21**) and advantages (**Slide 4MO-22**) of Misoprostol for the treatment of postpartum haemorrhage due to uterine atony. Stress that to date, Misoprostol has proven effective in postpartum haemorrhage prevention but not in treatment. However Misoprostol could be useful in controlling postpartum bleeding from uterine atony but further research is needed to prove it.

• Show **Slide 4MO-23** and discuss what should be done if these measures are unsuccessful and bleeding continues. Stress the necessity of informing the surgery team in a timely manner, and ordering blood components, as well as clearly recording fluid and blood transfusions.

• Show **Slide 4MO-24**, and stress that in case of continued bleeding and ineffective of measures it is necessary to be ready for surgical treatment while continuing infusion therapy. Ask the participants which methods for the temporary arrest of bleeding they know.

• Explain the technique of bimanual compression of the uterus (**Slide 4MO-25**) and initiate a discussion of theoretical advantages and disadvantages of bimanual compression versus internal massage of the uterus. Write them on the flipchart.

• Show another method to temporarily arrest bleeding with **Slide 4MO-26**, (compression of the aorta) and stress that other methods to temporarily arrest bleeding did not prove effective, wasted time and should not be used.
• Drive the discussion to the conclusion that the midwife is the appropriate professional to deal with PPH in case of emergency until operative measures are undertaken.

• Show Slide 4MO-27 and note that trauma is one of the leading causes of PPH. Unnecessarily hysterectomies are frequently performed because the birth canal is often not examined for trauma.

• Ask the participants from group three to present indications and methods for the complete arrest of bleeding.

• Show Slide 4MO-28 and explain that surgical haemostasis should be initiated as soon as possible if conservative measures are ineffective. Stress that late recourse to surgical haemostasis is one of the leading factors contributing to poor results in cases of obstetric haemorrhage.

• Show Slide 4MO-29 and present alternatives to hysterectomy in case of severe atonic PPH. Note that, except for ligation of internal iliac arteries, these procedures are simpler and safer than hysterectomy, are not so traumatic and preserve future fertility.

• Show evidence of effectiveness in Slides 4MO-30 and explain technique in Slides 4MO-31 of compressive sutures. Tell the participants that the technique of the B-lynch suture operation will be discussed during the clinical week.

• Slides 4MO-32 and 4MO-33 demonstrate the evidence of the ligature of uterine vessels.

• Show Slide 4MO-34 and ask the participants about hysterectomy incidences in their facility/region and compare them with the presented data.

• Note the change in indications of hysterectomy: from uterine atony as the most frequent in the 70s to anomalies of placental insertion in late 80s. Ask participants to explain why these changes happened. Possible explanations: at the end of the 80-s, and in the beginning of the 90s, evidence of high doses of oxytocin, prostaglandins and ligation of uterine vessels effectiveness for treatment of PPH were reported.

• Discuss in what cases total hysterectomy should be performed and when leaving the cervix in place would be a better option (Slide 4MO-35 and notes). Explain the following:
  
  o It is believed that if cervix is not removed during hysterectomy, it may serve as a source of bleeding in case of coagulation disturbances and may lead to maternal death. In reality, in the case of disseminated intravascular coagulation syndrome (DIC), the cervix is just one of the many sources of bleeding (abdominal wall wound, another ligatures, and injection sites are the other sources).

  o Increased rate of maternal deaths associated with subtotal hysterectomy happens because this operation is performed on the most severely ill patients, who have already experienced a large loss of blood volume or who are severely shocked. There was no time for a total hysterectomy.
• Show Slide 4MO-36 which presents an excerpt from the Report on confidential enquiries into maternal deaths in the United Kingdom 2000-2002 and makes conclusion about surgical treatment (Slide 4MO-37). Knowing that there are many effective alternatives of hysterectomy (prostaglandins, uterine artery ligation, compression sutures), should make it easier for doctors to decide on surgical treatment (laparotomy) that is vital in the most severe cases of PPH.

• After group four presents, show the general principles of infusion therapy (Slide 4MO-38) and the results of studies that evaluated whether colloid solutions are better than crystalloids in resuscitating severe patients (Slides 4MO-39 and 4MO-40). Ask the participants to speak from their experience about the adverse effects of dextran, albumin and pentastarches.

• Discuss indications and adverse effects of red-cell transfusion. Show Slide 4MO-41 and note that the only purpose of red-cell transfusion is to restore the oxygen-carrying capacity of the blood. Mention that red-cell transfusion may adversely affect microcirculation (lots of microscopic clots) or blood coagulation (haemolysed erythrocytes, increase of enzymes activity, etc) in an already compromised patient. Risks of transfusion-transmissible infections, incompatibility and other transfusion complications should be considered.

• Show Slide 4MO-42 and note increased maternal mortality in cases when transfusion occurred with women who had high haematocrits. At the same time mortality increased in the absence of transfusion in women with critically low haematocrits.

• Slide 4MO-43 presents indications and requirements for fresh-frozen plasma transfusion. Stress that plasma causes the same complications as red-cell transfusion and should not be used for volume replacement therapy, or in the treatment of hypoproteinemia when a coagulation factor deficiency is not confirmed. The fresh-frozen plasma transfusion is effective only if infused in very large volumes and very quickly.

• Ask the participants from the fifth group to focus on the roles of staff during management of severe PPH, when each needs to know precisely his/her responsibilities. Ask them to list essential supplies and equipment necessary in these cases and to calculate how many persons are needed for effective care in cases of severe PPH.

• After presentation by the fifth group show Slide 4MO-44 and make conclusions on the importance of organizational aspects of severe PPH management: the availability of comprehensive protocols with clear definitions of responsibility for of each staff member, as well as conducting trainings on regular basis.

**Activity 4 – Conclusions (15 min)**

• Show participants Slides 4MO-45 and 4MO-46 which summarize the key information which participants received during their work with this module.

• Conclude working with this module by asking if participants have any questions or additional points they want to make. Answer all the participants’ questions.
References


Activity 2

Group 1 (Midwives)
List the initial steps of early PPH treatment

Group 2 (Midwives)
List all procedures for arresting bleeding before a laparotomy, a procedure that can be done by a midwife

Group 3 (Obstetricians)
List the indications and surgical methods for the complete arrest of bleeding

Group 4 (Obstetricians)
List the basic rules and principles of fluids replacement

Group 5 (Midwives and Obstetricians)
Give a role to each group member to describe the actions of each participant in a case of severe PPH
Module 5MO

Prelabour Rupture of Membranes

Module objectives

At the end of the module participants should:

- Know the recommendations regarding the diagnosis, investigation and management of women with prelabour rupture of membranes
- Understand the role of prophylactic antibiotics, steroids and tocolytic agents, and the appropriate time to deliver women with prelabour rupture of membranes
- Know the techniques to improve perinatal outcomes in women with prelabour rupture of membranes
- Have a clear understanding of the advantages and disadvantages of active and expectant management of prelabour rupture of the membranes at or near term.

Module structure and duration:

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<th>Activity</th>
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<td>Activity 2 – Small group work</td>
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<td>Activity 3 – “Brain storming”</td>
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<td>Activity 4 – Presentation</td>
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<td>Activity 5 – Conclusion</td>
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Module preparation

- Review the current publications on prelabour rupture of membranes
- Ensure that all participants have a copy of the Participant’s Manual
- Ensure that all facilitators know their respective duties for working with this module
Materials and audiovisual equipment

Materials

- Participant’s Manual
- Case studies for small group work

Equipment

- Multimedia or overhead projector
- Flipchart
- Markers
- Pens and pencils

Key messages

Preterm prelabour rupture of membranes:

- Expectant management is recommended if gestational age less than 34 weeks and no contraindications for pregnancy prolongation.

- Digital cervical examination should not be performed in patients who are not in labour and in whom immediate induction of labour is not planned. Speculum examination is preferred.

- Antibiotics prolong the latency period and improve perinatal outcome and should be administered according to the published protocol.

- Antenatal corticosteroids should be administer if gestational age 24 to 34 weeks.

- Short-term tocolysis may be considered to facilitate maternal transportation as well as the administration of antenatal corticosteroids and antibiotics.

- Long-term tocolysis is not indicated.

Prelabour rupture of membranes at or near term:

- Labour may be induced at the time of presentation or patients may be observed for up to 24 to 72 hours for the onset of spontaneous labour.

- Digital cervical examination should not be performed in patients who are not in labour and in whom immediate induction of labour is not planned. Speculum examination is preferred.

- Antimicrobial prophylaxis for GBS should be given only after the onset of labour.

- Antimicrobial prophylaxis for non-GBS infection can be restricted to those who develop clinical indications for antibiotic treatment.
Key messages

- Immediate induction with oxytocin associated with fewer rates of chorioamnionitis than both vaginal prostaglandins and expectant management.

Classroom work (105 min)

Activity 1 - Introduction (5 min)

- Show Slide 5MO-1 and explain that during the module they will discuss the evidence-based tactics of PROM management.
- Explain that in this module you will discuss the clinical issues regarding rational PROM management, the evidence and recommendations regarding management of preterm prelabour rupture of membranes and prelabour rupture of membranes at and near term.

Activity 2 – Small group work (25 min)

- Split the participants into 3 groups.
- Give each group a case study printed on a separate sheet of paper, and ensure that the groups understand their tasks. Give each group a sheet of flip-chart paper and a marker.
- Tell participants that they have 10 minutes to discuss the case and write their answers on the flipchart paper.

Group 1 – Case study 1

- Olga was admitted to the maternity with preterm prelabour rupture of membranes which happened 2 hours earlier. This is her 1st pregnancy, gestational term is 30 weeks. The pregnancy was not complicated. The woman is healthy. No labour.
  - Which investigations are necessary in this case?
  - Develop a plan of further management for this patient

Group 2 – Case study 2

- Valentina was admitted to the maternity with PROM which happened 2 hours earlier. This is her 1st pregnancy, gestational term is 40 weeks. The pregnancy was not complicated. The woman is healthy. No labour.
  - Which investigations are necessary in this case?
  - Develop a plan of further management for this patient
If the group selects active management, ask them to describe the tactics they would use if in 10 hour contractions are rare and weak and cervical dilatation is 3 cm.

**Group 3 – Case study 3**

- Tatiana was admitted to the maternity with PROM which happened 48 hours earlier. This is her 1st pregnancy, gestational term is 38 weeks. The pregnancy was not complicated. The woman is healthy. Labour was induced by oxytocin.
- In 5 hours the signs of choroeamnionitis and foetal distress have appeared. Cervical dilatation is 4 cm.
  - What tactics are recommended in this case?

- Ask a representative of each group to present the results of group work to the other trainees. During the presentation ask the participants to explain the goal of their investigations and management tactics. Do not comment on the participants’ presentations.

- Tell the participants that at the end of the module you will return to the results of their group work written on the flipchart and will re-discuss them.

**Activity 3 – “Brain storming” (15 min)**

- Based on the results of group work, ask the participants to think about questions about PROM which they would like answered at the end of the module.

- Give them one example of a question they can develop (e.g. from Case study 1: Which tactic is the most logical in preterm PROM – expectant or active?)

- Write all participants’ questions on a sheet of flipchart paper. Ensure that all the questions are there.

- Place this flipchart sheet on a visible place.

**Activity 4 – Presentation (40 min)**

- Start the presentation showing Slide 5MO-2 and give two definitions of prelabour rapture of membranes: 1) preterm prelabour rupture of membranes (PPROM) which occurred at 24 – 37 weeks of gestation and 2) prelabour rupture of membranes at or near term (PROM) which occurred at 37 full weeks of gestation or after.

- Go to Slide 5MO-3 and say that despite the fact that PPROM complicates only 2% of pregnancies, it is associated with many serious complications including neonatal death. The three causes of neonatal death associated with PPROM are prematurity, sepsis and pulmonary hypoplasia. Women with intrauterine infection deliver earlier than non-infected women and infants born with sepsis have a mortality rate four times higher than those without sepsis. In addition, there are maternal risks associated with chorioamnionitis.
• Stress that there is evidence demonstrating an association between infection ascending from the lower genital tract and PPROM. In women with PPROM about one-third of pregnancies have positive amniotic fluid cultures and studies have shown that bacteria have the ability to cross intact membranes.

• Show Slide 5MO-4 and discuss how to make a diagnosis of PROM. Emphasize that the best diagnosis is made by a history suggestive of spontaneous rupture of membranes (SROM), followed by a sterile speculum examination demonstrating pooling of fluid in the posterior vaginal fornix; in this case a Nitrazine test is not necessary.

• Tell participants that a series of tests have been used to confirm membrane rupture; the most widely used has been the Nitrazine test, which detects pH change, and has a sensitivity of 90% and a false positive rate of 17%. More recently, other tests have been evaluated in the diagnosis of ruptured membranes and foetal fibronectin and raised insulin-like growth factor binding protein-1 in cervical/vaginal secretions have reported sensitivities of 94% and 75% and specificities of 97%, respectively.

• Show Slide 5MO-5 and present the possible tactics for the management of women with PPROM.

• Than show Slide 5MO-6 and discuss when digital vaginal examination should be performed. Emphasize that digital vaginal examination is best avoided unless there is a strong suspicion that the woman may be in labour. This is because micro-organisms may be transported from the fingers to the vagina and into the cervix, leading to intrauterine infection, prostaglandin release and preterm labour.

• Tell participants that one retrospective study reported that the latency interval between SROM and delivery in those who had a digital vaginal examination was significantly shorter than if only a sterile speculum examination was performed.

• Show Slides 5MO-7 and 5MO-8. Discuss antenatal tests (monitoring) which should be conducted in case of PPROM and their effectiveness (Slide 5MO-7). Tell participants that the criteria for the diagnosis of clinical chorioamnionitis include maternal pyrexia, tachycardia, leucocytosis, uterine tenderness, offensive vaginal discharge and foetal tachycardia. During inpatient observation, the woman should be regularly examined for such signs of intrauterine infection and an abnormal parameter or a combination of them may indicate intrauterine infection. The frequency of maternal temperature, pulse and foetal heart rate auscultation should be 4 - 8 hours. Then show Slide 5MO-8 and stress that biophysical profile scoring or Doppler velocimetry should not be considered as first-line surveillance or as a diagnostic test for foetal infection. Also tell participants that routine amniocentesis is not recommended for women with PPROM. Despite the fact that amniocentesis has the potential to detect sub-clinical infection before the onset of maternal signs of chorioamnionitis, and before the onset of foetal sepsis, allowing appropriate intervention such as administration of antibiotics in infected cases and/or delivery, depending on the gestation, and expectant management for women with negative amniotic fluid cultures, the role of amniocentesis in improving outcome remains to be determined.
• Show **Slide 5MO-9**. Note that the use of antibiotics in PPROM statistically reduces the rate of serious complications. Tell participants that there was a variation in the choice of antibiotics used and the duration of therapy in the studies examined in one meta-analysis. As a result of this meta-analysis there are two proved recommendations:
  o Erythromycin (250 mg orally every 6 hours) should be given for 10 days following the diagnosis of PPROM. [A]
  o Co-amoxiclav is not recommended for women with PPROM because of concerns about necrotising enterocolitis. [A]
  o Erythromycin 250 mg orally three times a day for 7 days PLUS Amoxicillin 500mg orally three times per day for seven days

• Show **Slide 5MO-10** and explain that indications for antenatal corticosteroid therapy include women with PPROM between 24 and 34 weeks of gestation. Emphasize that this technology is associated with statistically significant reduction in rates of:
  o Respiratory distress syndrome
  o Intraventricular haemorrhage
  o Necrotising enterocolitis

• Go to **Slide 5MO-11**. Stress that **only** woman with PPROM and uterine activity who require intrauterine transfer or antenatal corticosteroids should be considered for tocolysis. Prophylactic tocolysis in women with PPROM without uterine activity is not recommended, because tocolysis after PPROM did not increase the interval between membrane rupture and delivery or reduce neonatal morbidity.

• Show **Slide 5MO-12** and say that in the absence of clear evidence that tocolysis improves neonatal outcome following PPROM, it is reasonable not to use it. It is possible that tocolysis could have adverse effects, such as delaying delivery from an infected environment, since there is an association between intrauterine infection, prostaglandin and cytokine release and delivery. However, the benefits of antenatal steroids apply equally to women with PPROM and, in some clinical circumstances; the risk–benefit ratio may lead to consideration of tocolysis for this purpose. Similarly it would seem wise to consider tocolysis for transfer of women, depending on individual circumstances. Stress that aggressive tocolysis after PPROM did not increase latency or decrease neonatal morbidity compared with either limited tocolysis or no tocolysis at all.

• Using **Slide 5MO-13** present information that transvaginal amnioinfusion in labour is not recommended for women with preterm rupture of membranes. Also explain that transabdominal amnioinfusion is not recommended as a method of preventing pulmonary hypoplasia in very preterm PROM. Stress that at the present time, there is insufficient evidence to recommend this treatment outside randomised trials.

• Show **Slide 5MO-14** and tell participants that women should be considered for outpatient monitoring of PPROM **only** after rigorous individual selection by a consultant obstetrician.

• Stress that outpatient monitoring should be considered only after a period of 48–72 hours of inpatient observation. Women should be advised of the signs and symptoms of chorioamnionitis and under what circumstances they should
seek the advice of a specialist. Women being monitored at home for PPROM should take their temperature twice daily or should be advised of the symptoms associated with infection. There should be clearly described local arrangements for the frequency of outpatient visits and what should happen at these visits.

- Go to Slide 5MO-15. Remind participants that many studies have demonstrated benefits in conservative management for gestations of less than 34 weeks, whereas the management of pregnancies complicated by PPROM between 34 and 37 weeks of gestation continues to be a contentious issue.

- Emphasize that delivery should be considered at 34 weeks of gestation.

- Where expectant management is considered beyond 34 weeks of gestation, women should be counselled about the increased risk of chorioamnionitis and its consequences versus the decreased risk of serious respiratory problems in the neonate, admission for neonatal intensive care and caesarean section.

- Show Slide 5MO-16 and explain that PROM complicates 6-19% of pregnancies and is associated with many serious complications. The risks of PROM at term relate to maternal and neonatal infection, prolapsed cord and foetal distress resulting in operative delivery or low five-minute Apgar score. Foetal distress may be caused by any of the complications listed.

- Show Slide 5MO-17. It presents the evidence about management of PROM at and near term:
  - With term, prelabour rupture of membranes (PROM), labour may be induced at the time of presentation or patients may be observed for up to 24 to 72 hours for the onset of spontaneous labour.
  - Women with prelabour rupture of the membranes at term (over 37 weeks) should be offered a choice of immediate induction of labour or expectant management.
  - Expectant management of women with prelabour rupture of the membranes at term should not exceed 96 hours following membrane rupture.

- Show next Slide 5MO-18 with the epidemiological data on time interval from term PROM to spontaneous labour and how it demonstrates that most women go into spontaneous labour within 24 hours of rupturing their membranes.
  - 86% of women will labour within 12–23 hours
  - 91% will labour within 24–47 hours
  - 94% will labour within 48–95 hours.
  - 6% of women will not be in spontaneous labour within 96 hours of PROM.

- As the time between the rupture of the membranes and the onset of labour increases, so may the risks of maternal and foetal infection. Induction of labour may reduce these risks

- Make conclusions regarding digital vaginal examinations in PROM, using Slides 5MO-19 and 5MO-20. The analysis of different tactics of PROM at term management showed that digital cervical examination is the key reason for the post-partum endometritis. Early induction is associated with a higher risk of endometritis than expectant management, as vaginal examination is not
performed before labour in expectant management. In the one trial, in expectant management 28% of neonates (5 out of 18) born to mothers who had a vaginal examination at admission, but none of 78 babies were infected in the group whose mothers did not have a digital cervical examination before labour. Emphasize that there is a direct connection between the number of vaginal examination and the risk of choreoamnionitis. The risk of such a complication increases 5 times when 8 or more vaginal examinations are performed.

- **Slide 5MO-21** contains information about the necessity of antibiotics administration in PROM for Group B streptococcus prevention. Emphasize that antibiotic prophylaxis for GBS should be given only after the onset of labour.

- Stress that antenatal treatment with penicillin is not recommended. Antenatal prophylaxis with oral penicillin does not reduce the likelihood of GBS colonisation at the time of delivery and so is not indicated in this situation.

- Also explain that antibiotic prophylaxis for GBS is unnecessary for women with preterm rupture of membranes unless they are in established labour. Antibiotic administration specifically for GBS colonisation is not necessary prior to labour. If these women are known to be colonised with GBS, antibiotic prophylaxis should be considered, especially if labour occurs prior to 37 weeks.

- Go to **Slide 5MO-22**. Tell participants that it is not clear if antibiotics should be given routinely for the prevention of chorioamnionitis, postpartum endometritis, and neonatal infections that are caused by organisms other than Group B streptococcus. Further, well designed randomised controlled trials are needed to assess the effects of a routine use of maternal antibiotics for women with prelabour rupture of the membranes at or near term.

- **Slides 5MO-23 and 5MO-24** contain information on different recommended regimens of antibiotics administration in PROM. Discuss all listed regimens with participants.

- Show **Slide 5MO-25** and discuss possible modes for the active management of PROM. Stress that PROM at and near term can be managed by immediate oxytocin induction or by vaginal (or endocervical) prostaglandin E2, gel, suppositories or tablets. Emphasize that vaginal prostaglandins resulted in more chorioamnionitis than immediate oxytocin but less chorioamnionitis than conservative management. Immediate oxytocin induction resulted in fewer cases of chorioamnionitis and endometritis.

- Go to **Slide 5MO-26** and discuss the advantages and disadvantages of active versus conservative management in PROM. Stress that conservative management may result in more maternal infections than immediate induction with oxytocin or prostaglandins. Planned management (with methods such as oxytocin or prostaglandin) reduces the risk of some maternal infectious morbidity without increasing caesarean sections and operative vaginal births. Fewer infants went to neonatal intensive care under planned management although no differences were seen in neonatal infection rates. Since planned and expectant management may not be very different, women need to have appropriate information to make informed choices. Emphasize that women view induction of labour more positively than expectant management. Also tell
participants that the difference in cost between induction with oxytocin and the other management options was statistically significant. Induction with oxytocin was found to be less costly when compared to the other treatment alternatives.

- Show Slides 5MO-27 and 5MO-28 and discuss the key recommendations of preterm PROM management.

- Than go to Slides 5MO-29 and 5MO-30 and discuss the key recommendations on management of PROM at and near term.

**Activity 5 – Conclusion (20 min)**

- Draw the participants’ attention to those questions which they listed on the flip-chart during Activity 3.

- Ask participants to answer each of them briefly. Ensure that all questions are answered. Answer the questions which are not covered by the presentation.

- Answer additional questions that come up.

- Than ask the participants to split into the same groups in which they worked during Activity 2. Give them the flipchart sheets with their answers to the case study questions.

- Ask participants if they have any changes to their initial opinions regarding the tactics of PROM management in the case studies. If the participants want to change any of the tactics they suggested at the beginning of the module, discuss why they want to make the changes. After that make the appropriate changes.

- Ask the participants if they have any questions on this topic. Answer these questions.
Effective Perinatal Care (EPC)

References


Activity 2

Group 1

Case study

Olga was admitted to the maternity with preterm prelabour rupture of membranes which happened 2 hours earlier. This is her 1\textsuperscript{st} pregnancy; gestational term is 30 weeks. The pregnancy was not complicated. The woman is healthy. No labour.

Questions for discussion

1. Which investigations are necessary in this case?
2. Develop a plan of further management for this patient

Group 2

Case study

Valentina was admitted to the maternity with PROM which happened 2 hours earlier. This is her 1\textsuperscript{st} pregnancy; gestational term is 40 weeks. The pregnancy was not complicated. The woman is healthy. No labour.

Questions for discussion

1. Which investigations are necessary in this case?
2. Develop a plan of further management for this patient
Group 3

Case study

Tatiana was admitted to the maternity with PROM which happened 48 hours earlier. This is her 1\textsuperscript{st} pregnancy; gestational term is 38 weeks. The pregnancy was not complicated. The woman is healthy. Labour was induced by oxytocin.

In 5 hours the signs of choreoamnionitis and foetal distress have appeared. Cervical dilatation is 4 cm.

Question for discussion:

1. What tactics are recommended in this case?
2. Develop a plan of further management for this patient
Module 6MO


Learning objectives
At the end of the module the participants should:

- Understand that inducing labour represents a complex series of interventions to artificially induce contractions before they begin spontaneously.
- Understand that labour should only be induced when vaginal delivery is possible, because inducing labour can prolong delivery.
- Understand the potential complications of induced labour.
- Be aware of the main indications for labour induction.
- Understand that the main methods of labour induction depend on the state of the cervix.
- Be aware that there are special cases where inducing labour requires the utmost caution because of the possible effects of induction on mother and foetus.

Module outline and length:

Part I – Classroom work – 60 minutes
Activity 1 – Introduction 5 min
Activity 2 – Work in small groups 15 min
Activity 3 – Interactive presentation 35 min
Activity 4 – Conclusion 5 min

Preparation for the module

- Get acquainted with the practices in other countries and regions that relate to this topic.
- Analyze the use of these practices in the present health care setting.
- Make sure that the tasks for the participants are understood where they are being taught.
- Make sure that all the participants have Participant Manual.
Preparation for the module

- Ensure that the other trainers know the scope of work they are responsible for during the training.

Materials and Audiovisual Equipment

Materials
- Participant Manual
- Murray W. Enkin et al. A Guide to Effective Care in Pregnancy and Childbirth
- A set of tasks for the participants

Equipment
- PowerPoint or slide-projector
- Flipchart
- Markers in different colours

Key Messages

- Inducing labour shouldn’t be undertaken lightly. It can lead to various complications for mother and child. There should be strict reasons for both mother and foetus.

- Key questions for inducing labour:
  - Why? (indications)
  - When? (conditions)
  - How? (method – medication)

- “The decision to induce labour before the spontaneous commencement of delivery is one of the most radical means of intervention in the natural process pregnancy and child-birth.”

- Delivery should be induced in case where the risks of prolonging pregnancy are higher than the risks related to induction. In reality, there are not many indications for labour induction. False-positive results of diagnostic tests should be considered.

- The most important conditions for successful labour induction include documented confirmation that the reasons and risks were discussed with the
Key Messages

patient; repeated assessment of gestational age, biological preparedness of the cervix and foetal heart rate before inducing; and the availability of effective methods for preparation of the cervix for induction.

- An ultrasound to confirm gestational age should be offered before 20 weeks of gestation, as this reduces the need to induce labour for perceived prolonged pregnancy.

- Women with uncomplicated pregnancies should be offered labour induction beyond 41 weeks.

- After 41 weeks, women who decline labour induction should be offered increased antenatal monitoring that consists of twice weekly CTG and ultrasound estimation of amniotic fluid volume.

- Prior to a formally induced labour, women should be offered sweeping of the membranes.

- When membrane sweeping is proposed, discussions should inform the woman that it:
  - is not associated with an increase in maternal or neonatal infection
  - is associated with increased levels of discomfort during the examination and with bleeding.

- When an induced labour is started with prostaglandins, intravaginal PGE2 should be used in preference to intracervical preparations, as they are equally effective, and administration of vaginal PGE2 is less invasive.

- Wherever induced labour occurs, facilities should be available for continuous uterine and foetal heart rate (FHR) monitoring.

- Following an induced labour with vaginal prostaglandins (PGE2), foetal wellbeing should be established once contractions are detected or reported.

- Where oxytocin is being used for induction or augmentation of labour, continuous electronic foetal monitoring should be used.

- In the presence of abnormal FHR patterns and uterine hypercontractility (not secondary to oxytocin infusion), tocolysis should be considered. A suggested regimen is subcutaneous terbutaline 0.25 milligrams.

- In cases of suspected or confirmed acute foetal compromise, delivery should be accomplished as soon as possible, taking account of the severity of the FHR abnormality and relevant maternal factors. The accepted standard is delivery within 30 minutes.
Part I - Classroom work (60 min)

Activity 1 – Introduction (5 min)

- Show Slide 6MO-1 and discuss the objectives of this module.

- Go to Slide 6MO-2 and explain what labour induction is. Tell participants that induced labours were used widely in the 1950s when oxytocin was synthesized. The frequency of induced labours varies in different health care settings and regions and it is increasing. The understanding of delivery mechanisms and successful induced labours has been increasing in recent years.

- Many factors affect how a cervix ripens. The mediators in this process are prostaglandins E2 (PGE2) and F2alpha (PGF2alpha). Their exogenous application stimulates ripening the cervix. Endogenous and exogenous oxytocin is the main stimulator of uterine contractions. It also stimulates the production of PGE2 and PGF2alpha.

- Stress the fact that inducing labour interferes with the natural process of pregnancy and can lead to a number of complications. It should only be administered in situations where the risk of continuing the pregnancy is higher than the risk related to induction.

Activity 2 – Small group work (15 min)

- Split the participants into 4 groups and give each group a piece of flipchart paper and one marker.

- Stress that the team-work is very important and that the opinions of every participant is needed to solve the tasks.

- Show Slide 6MO-3 and give each group a topic for discussion and ask each group to write their answers on the flipchart papers within 5 minutes. Let the group decide who will present the results of the group.

- Tasks for the small-group work:
  Group 1: Indications for labour induction
  Group 2: Contraindications and conditions for labour induction
  Group 3: Methods of labour induction
  Group 4: Possible complications during labour induction

- Explain to the participants that after the presentation of each small-group a trainer will present information on the topic and then there will be time for discussion and questions.

Activity 3 – Interactive presentation (35 min)

- Ask the participants of the Group 1 to present the results of their group work.
• After the presentation, show Slide 6MO-4 and read the quotation from the Murray Enkin book about the fact that the decision to induce labour before spontaneous commencement of delivery is one of the most radical ways of interfering in the natural process of pregnancy and birth. That’s why labour induction should be administered only in situations when the risk of allowing the pregnancy to continue is higher than the risk of induction.

• Go to Slide 6MO-5 and present the list of indications for labour induction. The most frequent reasons for inducing labour include a pregnancy term of more than 41 weeks and premature rapture of membranes. Point out that issues of pregnancy-induced hypertension, preeclampsia, eclampsia, premature rapture of membranes, and chorioamnionitis will be discussed in separate training modules.

• Show Slide 6MO-6 and explain that an ultrasound to confirm gestation should be offered before 20 weeks of gestation, as this reduces the need for induction for perceived prolonged pregnancy. Stress that women with uncomplicated pregnancies should be offered labour induction beyond 41 weeks. Emphasize that from 42 weeks, women who decline an induced labour should be offered increased antenatal monitoring consisting of a twice weekly CTG and ultrasound estimation of maximum amniotic pool depth.

• Go to Slide 6MO-7 and describe the reasons why women request induced labours as well as the economic considerations of a policy of routinely offering ‘elective’ induction for psychological or social reasons. Emphasize that there is insufficient evidence to recommend the elective induction of labour for maternal request.

• Showing Slide 6MO-8, discuss each reason listed on the slide, and the benefits and disadvantages of labour induction for each of them. Tell them the following:
  o Women who have pregnancies complicated by diabetes should be offered labour induction prior to their estimated delivery date. Induced labour in term pregnancies in women with diabetes is associated with a reduced risk of macrosomia. Routine induction does not appear to increase the risk of caesarean section or neonatal morbidity, cases of which were rare.
  o Currently, the evidence is inconclusive that a policy of labour induction for suspected foetal macrosomia in women who are not diabetic can reduce maternal or neonatal morbidity.
  o The perinatal mortality rate in twin pregnancies is increased in comparison with singleton pregnancies at term.
  o No conclusions can be drawn from the available trial evidence relating to the merits of an active policy of induced labours in uncomplicated multifoetal pregnancies.
  o Labour induction is not contraindicated in women with a history of a previous caesarean section but careful consideration of the woman’s clinical condition should be taken before induction is started.
  o In history of previous caesarean section, women should be informed of the two- to three-fold increased risk of uterine rupture and around 1.5 fold increased risk of caesarean section in induced and/or augmented labours compared with spontaneous labours.
  o In history of previous caesarean section, women should be informed that there is a higher risk of uterine rupture with induction of labour with prostaglandins.
There is an increased risk associated with planned vaginal breech delivery. The risks associated with induced labour with a breech presentation cannot be quantified from the available trial literature.

When undertaking to induce labour in women with recognised risk factors (including suspected foetal growth compromise), the clinical discussion regarding the timing and method of induction should be undertaken at a consultant level. The induction process should not occur on an antenatal ward.

No study could be located that considered induced labour specifically in babies with suspected foetal growth compromise. There is insufficient data to comment on the risks of inducing labour in women with babies with known growth restriction.

- Make the conclusion that adequately designed RCTs reporting relevant clinical outcomes in specific clinical groups are needed to evaluate the risks and benefits of labour induction for women whose pregnancies are complicated by or associated with above-mentioned conditions.

- Ask participants if they have any questions about the indications for labour induction. Answer all possible questions.

- Ask the participants of group 2 to present contraindications and conditions needed for inducing labour.

- After the presentation show Slide 6MO-9 and explain that the process of labour induction should only be considered when vaginal delivery is possible. Contraindications for inducing labour include, but are not limited to, the situations shown on the slide.

- Go to Slide 6MO-10 and discuss the prerequisites to labour induction. Stress that before beginning induction it is necessary to discuss the possible complications with the mother. Emphasize that inducing labour should only follow informed consent by the woman. For consent to be fully informed it should include the reasons for inducing, the choice of method to be used and the potential risks and consequences for accepting or refusing an offer to induce labour.

- Ask participants if they have any questions about contraindications and reasons for labour induction. Answer all possible questions.

- Ask the participants of group 3 to present methods of labour induction.

- After the presentation show Slide 6MO-11 and explain that there are different methods of labour induction, but most often the method depends on the condition of the cervix. Point out that only 4 methods for inducing labour are currently used, and each depends on the readiness of the cervix.

- Go to Slide 6MO-12 and explain that the simplest procedure is to sweep the membranes with a gloved finger lubricated with antiseptic cream and inserted gently into the cervical canal. If performed by an experienced doctor or midwife, this need not be uncomfortable. After 40 weeks' gestation, this procedure can halve the subsequent need for further induction techniques, but at 38-40 weeks it does not significantly increase the number of women who go into labour within 7 days.
Stress that when membrane sweeping is proposed, discussions inform the woman that membrane sweeping:
  - Is not associated with an increase in maternal or neonatal infection
  - Is associated with increased levels of discomfort during the examination and with bleeding.

Emphasize that prior to formal induction, women should be offered sweeping of the membranes.

Show Slide 6MO-13 and present methods of cervical ripening. Explain that a ripe cervix is defined as one with a modified Bishop’s score of greater than eight. Stress that it is recommended that the physician or certified midwife use the Bishop Score as part of the assessment process.

Discuss the assessment of cervical readiness using the Bishop scale.

**Bishop score**

**Cervical dilation**
1. Cervical dilation < 1 cm: 0 point
2. Cervical dilation 1-2 cm: 1 point
3. Cervical dilation 3-4 cm: 2 points
4. Cervical dilation > 5 cm: 3 points

**Cervix length (effacement)**
1. Cervical length > 4 cm (0% effacement): 0 point
2. Cervical length 2-4 cm (0 to 50% effacement): 1 point
3. Cervical length 1-2 cm (50 to 75% effacement): 2 points
4. Cervical length < 1 cm (>75% effacement): 3 points

**Consistency of cervix**
1. Hard consistency of cervix: 0 points
2. Medium consistency of cervix: 1 point
3. Soft consistency of cervix: 2 points

**Cervix position**
1. Cervix is in posterior position: 0 point
2. Cervix is in mid-position: 1 point
3. Cervix is in anterior position: 2 points

**Position of presenting part**
1. Position of presenting part with regard to inter-spinal line -3 cm: 0 point
2. Position of presenting part with regard to inter-spinal line -1 cm: 1 point
3. Position of presenting part with regard to inter-spinal line +1 cm: 2 points
4. Position of presenting part with regard to inter-spinal line +2 cm: 3 points

**Modifiers**
- Add 1 point to the scale if:
  1. Preeclampsia
  2. For each previous vaginal delivery
- Deduct 1 point if:
  1. Pregnancy is being planned
  2. Woman who never delivered
  3. Premature or prolonged rupture of membranes

**Explanations**

Indications for cervical ripening with the use of prostaglandins:
Effective Perinatal Care (EPC)

- Bishop score <5
- Wholeness of membranes
- Irregular contractions

Indications for labour induction with the use of oxytocin:
- Bishop score >= 5
- Rupture of membranes

- Present Slide 6MO-14. Discuss the possible regimens of intracervical and intravaginal prostaglandins administration. Explain that there are no randomized clinical trials comparing different timing of the use of oxytocin after prostaglandin gel. The manufacturer of intravaginal dinoprostone suggests a minimum of 12 hours, while the manufacturer of intracervical dinoprostone suggests a minimum of six hours. Therefore, it is not recommended to administer oxytocin earlier than 6 hours after the last dose of any prostaglandins.

- Show Slide 6MO-15 and explain that when labour is inducing with prostaglandins, intravaginal PGE2 should be used instead of intracervical preparations, as they are equally effective and administration of vaginal PGE2 is less invasive.

- Go to Slide 6MO-16 and show that the use of estrogens for cervical ripening is suggested on the theoretical grounds that these agents might ripen the cervix without concomitant effects on uterine contractility. Data from controlled trials with a variety of estrogenic preparations failed to show any beneficial effects. A meta-analysis of five trials has concluded that the use of oxytocin to ripen the cervix is not effective. The use of porcine relaxin to soften the cervix and shorten labour had a brief vogue of popularity in the 1950s. Placebo-controlled trials failed to show any benefits. There is no research that shows the effectiveness of the intravenous use of prostaglandins for ripening the cervix.

- Present Slide 6MO-17 and explain that amniotomy (artificial rupture of membranes) is a very simple procedure, which can be performed without the assistance of other health care personnel if membranes are accessible. Thus, pharmacological interference can be avoided. Direct their attention to the fact that amniotomy alone is not effective among 50% of women with a favourable state of cervix. In this case oxytocin is necessary.

- Show Slide 6MO-18 and stress that a number of undesirable consequences have been attributed to artificial rupture of membranes. These include: pain and discomfort, intra-uterine infections (occasionally leading to septicaemia), early decelerations in the foetal heart rate, umbilical cord prolapse and bleeding, either from foetal vessels in the membranes, from the cervix, or from the placental site. Serious complications, fortunately, are rare. The view that amniotomy predisposes to foetal heart-rate decelerations is largely based on potential cord compression due to diminished amniotic fluid volume but there is no evidence that this risk is important enough to be a main determinant in choosing a method for inducing labour.

- Go to Slide 6MO-19 and emphasize that oxytocin can be administered to induce labour by controlled intravenous infusion in standard dilution only. It is forbidden to use oxytocin orally.
• **Slides 6MO-20 and 6MO-21** present method of oxytocin administration. Tell participants that for the conversion to the equivalent to drops per minute (20 drops = 1 ml) they can use the following scheme:

Upon dilution of 10 IU of Oxytocin in 500 ml of Normal Saline:
1mU = 3 ml/hour = 60 drops/60 minutes = 1 drop/minute.

Upon dilution of 5 IU of Oxytocin in 500 ml of Normal Saline
1mU = 6ml/hour = 120 drops/60 minutes = 2 drops/minute

Upon dilution of 30 IU of Oxytocin in 500 ml of Normal Saline
1mU = 1ml/hour = 20 drops/60 minutes = 0.33 drops/minutes

Upon dilution of 5 IU of Oxytocin in 1000 ml of Normal Saline
1mU = 12ml/hour = 240 drops/60 minutes = 4 drops/minute

• Ask the participants to find the Attachment 1 in their “Participant guides” at the end of this module – “Oxytocin infusion rates and different concentrations”. Tell them that in this attachment they can find different options for different concentrations of oxytocin solution with infusion rates in drops per minute and volume infused per hour. Tell them that these tables can facilitate calculations and can be used in their future work.

• Tell participants that different sources recommend different maximum dose of oxytocin use for labour induction (i.e. RCOG – 32 mU/min; WHO – 60 mU/min). Emphasize that healthcare providers should strictly follow the local protocols in identifying the maximum dose of oxytocin for labour induction.

• The oxytocin use should be documented on the WHO partograph throughout the labour.

• Show **Slide 6MO-22** and point out that Misoprostol is a very effective method to ripen the cervix and induce labour. Its advantages are simplicity of use, low cost and high effectiveness. However, the use of Misoprostol is associated also with a higher risk of negative effects and the optimal dose regime has not been studied and reported. Also, its use for labour induction is not approved by many countries. For example, the Royal College of Obstetricians and Gynaecologists recommends that until the best dose regime is determined, Misoprostol’s use should be confined to clinical trials.

• Present **Slide 6MO-23** with the chart of Misoprostol use. Also discuss the issue that there is not enough evidence for optimal regimens and safety. Direct participants’ attention to the result of research on low-dose Misoprostol use (which they have in their “Participants Guide” in notes to this slide) and tell them that lower doses lead to lower levels of uterus hyperstimulation. Point out that 25 mcg Misoprostol pills are included in the WHO Essential Drugs list, however Misoprostol can only be used in countries where it is registered and allowed for use in obstetric services.

• Go to **Slide 6MO-24** and discuss the necessity of foetal wellbeing assessment when inducing labour. Tell participants that wherever labour is induced, facilities should be available for continuous uterine and foetal heart rate (FHR) monitoring. Stress that following an induction with vaginal prostaglandins (PGE2), the woman should be advised to lie down for at least 30 minutes,
foetal wellbeing should be established once contractions are detected or reported. Where oxytocin is being used for induction or augmentation of labour, continuous electronic foetal monitoring should be used.

- Ask participants if they have any questions about the methods of inducing labour. Answer all possible questions.

- Ask the participants of group 4 to present possible complications of labour induction.

- After the presentation show Slide 6MO-25. Discuss with participants each possible complication of inducing labour in detail.

- Ask the participants to define tachysystole, hyper-tonus and hyperactivity. Listen carefully to their answers. Tell them that uterine hypercontractility without FHR changes included uterine tachysystole (more than five contractions per ten minutes for at least 20 minutes) and uterine hypersystole/hyper tonicus (a contraction lasting at least two minutes). Uterine hyperstimulation with FHR changes denoted uterine hyperstimulation syndrome (tachysystole or hypersystole with FHR changes such as persistent decelerations, tachycardia or decreased short term variability).

- Go to Slide 6MO-26 and stress that in cases of uterine hypercontractility with a suspicious or pathological cardiotocograph (CTG) secondary to oxytocin infusions, the oxytocin infusion should be decreased or discontinued. In the presence of abnormal FHR patterns and uterine hypercontractility (not secondary to oxytocin infusion), tocolysis should be considered. A suggested regimen is subcutaneous terbutaline 0.25 milligrams. In cases of suspected or confirmed acute foetal compromise, delivery should be accomplished as soon as possible, taking into account the severity of the FHR abnormality and relevant maternal factors. The accepted standard is that delivery should happen within 30 minutes. If prostaglandin only has been used, removal of the remainder of the agent may help to alleviate the uterine hypercontractility. However, irrigation of the cervix or vagina is not beneficial.

**Activity 4 - Conclusion (5 min)**

- Show Slide 6MO-27 and summarize. Stress once again that the decision to induce labour should not be quick or easy. There should be distinct reasons, conditions and a choice of medications available depending on the readiness of the cervix for induction. Labour should be induced only in cases where the risk of continuing the pregnancy is higher than the risk of induction.

- Ask the participants if they have any questions related to this topic. Answer the questions.
References


8. Crowley P. Interventions for preventing or improving the outcome of delivery at or beyond term. Cochrane Database of Systematic Reviews, 2005, Issue 2.


Module 7MO

The Unsatisfactory Progress of Labour
Intrapartum Oxytocin Administration

Learning objectives

At the end of this module the participants will:

• Understand the importance of recognizing when labour is not progressing satisfactorily.
• Know the methods of labour augmentation.
• Know how to augment labour with oxytocin and understand the dangers related to this procedure.
• Know when to stop augmentation.

Module structure and duration:

Classroom work – 60 minutes

Activity 1 – Introduction 5 min
Activity 2 – Small group work 15 min
Activity 3 – Interactive presentation 25 min
Activity 4 – Small group work 10 min
Activity 5 – Conclusion 5 min

Module preparation

• Review all the existing evidence and the WHO recommendations concerning how to manage a labour that is not progressing satisfactorily.
• Ensure that all participants have a copy of the Participant’s Manual.
• Ensure that other facilitators know their duties when teaching this Module.

Materials and audiovisual equipment

Materials

• Participant’s Manual
**Materials and audiovisual equipment**

- A set of case studies (for each participant)

**Equipment**

- Video projector or projector overhead
- Presentation 7MO - EPC ENG
- Flipchart
- Markers
- Pens and pencils
- Name badges

**Key messages**

- It is very important to quickly identify any changes in the progress of labour that can have adverse effects on the mother and baby. In such cases, it is urgent that caregivers intervene in the progress of labour.

- The WHO Partograph is an effective tool to help caregivers recognize early that labour is not progressing well. It helps them make the appropriate decisions.

- Create a welcoming and friendly atmosphere in the maternity, have a companion present at birth if the mother wishes, provide food and fluid for her to reduce the rate of prolonged labour.

- Early amniotomy should not be used routinely.

- Amniotomy should be reserved for women whose labour is progressing abnormally.

- Oxytocin should be used with caution, followed by a close monitoring of the progress of labour and the condition of the mother and baby.

**PART I - CLASSROOM WORK - 60 MIN**

**Activity 1 – Introduction (5 min)**

- Start the session by presenting Slide 7MO-1 and direct their attention to the fact that an unsatisfactory progress of labour is the most frequent reason for caesarean section, forceps delivery or vacuum-extraction in developed countries, those issues, as well as the use of pain relief medication, all worsen
foetal well-being, increase the risk of postpartum haemorrhage leading to haemotransfusion, and increase the rate of infectious complications.

- Show slide 7MO-2 and highlight the signs that indicate an unsatisfactory progress of labour. Explain that the Partograph is an effective tool that helps caregivers to recognize early that labour is not progressing well. It helps them make the appropriate decisions.

**Activity 2 – Small group work (15 min)**

- The objective of this activity is to find what maternal and neonatal care practices exist in the participants' healthcare settings.
- Split the participants into 3 groups and offer each group a case scenario.

**Case study 1**

- This is Irena’s 1st pregnancy. The uterus started to contract 4 hours earlier and she is at 39 weeks gestation. She was admitted to the birth room at 10 am with:
  - Cervical dilatation was 2 cm, effacement – 40%, intermediate consistency
  - Intact membranes
  - The head was 5/5 above the pelvic brim
  - Uterus was contracting periodically – 2-3 contractions per 10 min, each lasting 15-20 seconds
- A vaginal examination after 4 hours showed
  - The same cervical dilatation, consistency and effacement
  - Membranes are still intact
  - Foetal head descent of 4/5
  - Uterus was contracting periodically – 2-3 contractions per 10 min, each lasting 20-25 seconds

**Case study 2**

- This is Elena’s 1st pregnancy and she is at 40 weeks gestation.
- She arrived at 2 p.m. with:
  - Regular uterine contractions: 2 per 10 minutes, each lasting 25 seconds
  - Cervical dilatation of 2 cm,
  - Intact membranes
  - Head 5/5 above the pelvic brim
- Next vaginal examination after 4 hours showed:
  - 5 cm cervical dilatation
  - Intact membranes
  - Foetal head descent of 4/5
  - Uterine contractions: 3 per 10 minutes each lasting 35 seconds.
- The next vaginal examination at 10 p.m. showed:
  - 6 cm cervical dilatation
  - Intact membranes
  - Head descent of 4/5
  - Uterine contractions: 3 per 10 minutes, each lasting 40 seconds
Case Study 3

- This is Maria’s 1st pregnancy and she is at 41 weeks gestation. Labour started at 3 a.m. and membranes were intact.
  - When she was examined in the birth room at 6 a.m.:
    - 2 cm of cervical dilatation
    - Intact membranes
    - No moulding of foetal skull bones
    - The head was 5/5 above the pelvic brim,
    - Uterine contractions were regular: 2 per 10 min, each lasting 25-30 seconds.
- Another vaginal examination at 10 a.m. showed:
  - 4 cm of cervical dilatation
  - Intact membranes
  - No moulding
  - Foetal head descent of 4/5,
  - Uterine contractions were regular: 3 per 10 min, each lasting 35 - 40 seconds. Maria moves actively during her labour.
- A vaginal examination at 2 p.m. detected:
  - 7 cm of cervical dilatation,
  - Membranes were ruptured with amniotic hook, clear amniotic fluid
  - First degree moulding
  - Head descent of 3/5 and
  - Regular uterine contractions: 3 per 10 min, each lasting 35-40 seconds. Maria moves actively during her labour. A progress of uterine contraction was observed 30 minutes after amniotomy - uterine contractions became 4 per 10 min, each lasting 50-55 seconds.
- The next examination 4 hours later showed:
  - Head descent of 3/5
  - 8 cm cervical dilatation
  - Moulding of third degree
  - Uterine contractions are regular: 4 per 10 min, each lasting 50-55 seconds
  - Clear amniotic fluid

- Ask the participants to plot the case on the Partograph and diagnose and develop a plan of action explaining it.
- Then explain you will return to the case studies at the end of the session to solve them with knowledge and information they learn in the module.

Activity 3 – Interactive presentation (30 min)

- Show Slide 7MO-3 which presents the WHO classification of the unsatisfactory progress of labour.
- Show Slide 7MO-4 and explain that it is very important to correctly differentiate between “false labour” and the “beginning of labour.” Tell them that the “beginning of labour” is always a retrospective diagnoses.
• Ask participants to recall the signs of the start of labour discussed in the Module “Partograph”.

• Go to Slide 7MO-5 and explain that misdiagnosing false labour or a prolonged latent phase, leads to unnecessary induction or augmentation, which may fail. This may lead to unnecessary caesarean sections and amnionitis. The diagnosis of prolonged latent phase is also made retrospectively.

• Show Slide 7MO-6 and explain that cervical dilatation to the right of the Alert line on the Partograph indicates a prolonged active phase.

• Explain that term “prolonged active phase” includes such conditions as cephalopelvic disproportion, obstruction, malposition or malpresentation and inadequate uterine activity. In order to tell these conditions apart, uterine contractions should be assessed.

• Go to Slide 7MO-7 and talk about the main signs of cephalo-pelvic disproportion and the key points of management.

• Show Slides 7MO-8 and 7MO-9 and talk about the main signs of obstruction and the key points of management.

• Go to Slide 7MO-10 and explain that inadequate uterine activity is the most common reason that labour does not progress well. Present the main signs of inadequate uterine activity and the key points of management.

• Ask participants about the methods they use in everyday practice to manage inadequate uterine activity. Go to Slide 7MO-11 and point out that there are several means of prophylaxis to manage inadequate uterine activity with proven effectiveness.

• The women allocated to labour and give birth in home-like birth settings used, on average, less pain medication during labour, were slightly less likely to have their labour augmented with oxytocin and had a slightly greater chance of satisfaction with their birth experience.

• Studies show that a supportive companion and ambulation during labour result in shorter labours and less frequent use of oxytocin. The support offered to women can include the continuous presence of a companion she knows or someone she doesn't but this depends on the mother’s wishes, or the provision of hands-on comfort and verbal encouragement from the staff.

• The results of several studies suggest that the supine position can adversely affect both the condition of the foetus and the progression of labour, because it interferes with the uterine blood supply by making uterine contractions less efficient. Allowing the mother to change her position frequently is an important way to avoid the adverse effects lying down during labour.

• Early amniotomy (artificial rupture of the amniotic membranes beyond 5 cm of cervical dilatation) has been advocated to prevent problems with the progress of labour in women in spontaneous labour. Go to Slide 7MO-12 and discuss the advantages and disadvantages of early amniotomy, emphasizing that early
amniotomy should not be routinely recommended as a way to deal with inadequate uterine activity.

- Show Slide 7MO-13 and explain that membrane rupture, whether spontaneous or artificial, often sets off the chain of events resulting in the development of uterine contractions (if the woman is not in labour) or augmentation of contractions (if she is already in labour).

- Show Slide 7MO-14 and present the key points of performing an amniotomy and monitoring the condition of mother and baby.

- Show Slides 7MO-15 and 7MO-16 and say that oxytocin to augment labour is an effective but quite a dangerous intervention in the process of labour that requires a relevant protocol agreed to by everyone involved and developed by the maternity for this situation.

- Discuss in detail how oxytocin to augment labour will be administered and how oxytocin dosages will be calculated by using Slides 7MO-17 and 7MO-18.

- Tell participants that assessing the effectiveness of augmenting labour is very important. Show Slides 7MO-19 and 7MO-20 and discuss all the points, both effective and ineffective, about labour stimulation.

- Show Slide 7MO-21 and 7MO-22 and discuss the possible complications of oxytocin infusion and how to manage them.

- Summarize the presentation with Slide 7MO-23 and discuss every bullet point thoroughly.

- Ask the participants if they have any questions. Answer all their questions.

**Activity 4 – Small group work (10 min)**

- Suggest discussing the clinical cases distributed to the participants during the small group session (Activity 2). Afterwards, each group will report if their approach to this problem changed after the presentation.

  - **Correct answer for Case 1**
    This case presents “false labour”. It confirms by the absence of cervical changes. Discussion points: Ask how this case would be managed according local clinical guideline?

    Correct management of this woman may include “medicated sleep” or discharge home or admission to the pathology department according to the local clinical guideline.

  - **Correct answer for Case 2**
    In this case, the initially normal progress of labour became slow due to inadequate uterine activity. During the first four hours of observation the labour moved to the active phase, but the rate of cervical dilatation during the next four hours was less then 1cm/hour. To augment the labour, amniotomy should be performed. Continue monitoring labour for one hour and encourage the
woman to move. Reassess the contractions in one hour, and, if still weak, augment with oxytocin.

- **Correct answer for Case 3**
  In this case, discuss the assessment done at 7cm, the interventions recommended and rationale. Explain that cervical dilatation to the right of the Alert line on the Partograph indicates a prolonged active phase, that includes such conditions as cephalopelvic disproportion, obstruction, malposition or malpresentation and inadequate uterine activity. In order to tell these conditions apart, uterine contractions should be assessed.

Tell the participants that duration of contractions at 2 a.m. (each lasting 35-40 seconds) was inadequate for active labour, so artificial rupture of membranes at was indicated.

Since the progress of uterine contractions was observed 30 minutes after amniotomy no augmentation with oxytocin was needed. Indicate that Maria was moving actively during her labour.

After the range of interventions are discussed, state the results of the next vaginal exam. The next examination 4 hours later showed head descent of 3/5, 8 cm cervical dilatation and moulding of third degree, uterine contractions are regular: 4 per 10 min, each lasting 50-55 seconds.

What is the diagnosis now? What is the appropriate action now? Given the slow rate of cervical dilatation in presence of active labour, no foetal head descent, and moulding of third degree are the signs of cephalo pelvic disproportion. Deliver by cesarean section.

- Propose discussing each case with the whole group.

**Activity 5 - Conclusion (5 min)**

- Labour abnormalities can be revealed early by using the WHO Partograph
- Creating a welcoming, friendly atmosphere in the maternity, having a companion present at birth and providing food and fluid reduce the rate of prolonged labour.
- Early amniotomy should not be used routinely.
- Amniotomy should be reserved for women who are not progressing well in labour.
- Oxytocin should be used with caution and the progress of labour should be closely monitored to assess the condition of mother and baby.
References


Activity 2

Case study 1

This is Irena’s 1st pregnancy. The uterus started to contract 4 hours earlier and she is at 39 weeks gestation. She was admitted to the birth room at 10 am with:

- Cervical dilatation was 2 cm, effacement – 40%, intermediate consistency
- Intact membranes
- The head was 5/5 above the pelvic brim
- Uterus was contracting periodically – 2-3 contractions per 10 min, each lasting 15-20 seconds

A vaginal examination after 4 hours showed

- The same cervical dilatation, consistency and effacement
- Membranes are still intact
- Foetal head descent of 4/5
- Uterus was contracting periodically – 2-3 contractions per 10 min, each lasting 20-25 seconds

Task:

1. Plot this case on the Partograph.
2. What is your diagnosis?
3. What actions will you take? Explain
### Case study 2

She arrived at 2 p.m. with:
- Regular uterine contractions: 2 per 10 minutes, each lasting 25 seconds
- Cervical dilatation of 2 cm,
- Intact membranes
- Head 5/5 above the pelvic brim

Next vaginal examination after 4 hours showed:
- 5 cm cervical dilatation
- Intact membranes
- Foetal head descent of 4/5
- Uterine contractions: 3 per 10 minutes each lasting 35 seconds.

The next vaginal examination at 10 p.m. showed:
- 6 cm cervical dilatation
- Intact membranes
- Head descent of 4/5
- Uterine contractions: 3 per 10 minutes, each lasting 40 seconds

**Task:**

1. Plot this case on the Partograph.
2. What is your diagnosis?
3. What actions will you take? Explain
Case study 3

This is Maria’s 1st pregnancy and she is at 41 weeks gestation. Labour started at 3 a.m. and membranes were intact.

When she was examined in the birth room at 6 a.m.:
- 2 cm of cervical dilatation
- Intact membranes
- No moulding of foetal skull bones
- The head was 5/5 above the pelvic brim,
- Uterine contractions were regular: 2 per 10 min, each lasting 25-30 seconds.

Another vaginal examination at 10 a.m. showed:
- 4 cm of cervical dilatation
- Intact membranes
- No moulding
- Foetal head descent of 4/5,
- Uterine contractions were regular: 3 per 10 min, each lasting 35 - 40 seconds. Maria moves actively during her labour.

A vaginal examination at 2 p.m. detected:
- 7 cm of cervical dilatation,
- Membranes were ruptured with amniotic hook, clear amniotic fluid
- First degree moulding
- Head descent of 3/5 and
- Regular uterine contractions: 3 per 10 min, each lasting 35-40 seconds. Maria moves actively during her labour. A progress of uterine contractions was observed 30 minutes after amniotomy - uterine contractions became 4 per 10 min, each lasting 50-55 seconds

The next examination 4 hours later showed:
- Head descent of 3/5
- 8 cm cervical dilatation
- Moulding of third degree
- Uterine contractions are regular: 4 per 10 min, each lasting 50-55 seconds
- Clear amniotic fluid

Task:

1. Plot this case on the Partograph.
2. What is your diagnosis?
3. What actions will you take? Explain