Assisted Vaginal Delivery via Vacuum Extraction

Facilitator's Guide

Refresher Training Module for Health Care Providers Implementing the MISP

Inter-agency Working Group on Reproductive Health in Crises Training Partnership

Acknowledgements

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Authors

This facilitator's guide was developed based on input from the IAWG membership. The materials were adapted from presentations originally created by Dr. Glen Mola and Tomo Watanabe, based on World Health Organization guidance. The authors are grateful to Tomo Watanabe, who contributed substantially to drafting the training module content and coordinating the pilot of the module. Kristen Harker of the Women's Refugee Commission contributed substantially to content development. Dr. Wilma Doedens and Kristen Harker contributed technical input. Namadia Consulting completed the design layout and Erin Roberts helped edit the document.

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Facilitator's Guide Overview

Introduction

The Minimum Initial Service Package (MISP) for Sexual and Reproductive Health (SRH) is a priority set of life-saving activities to be implemented at the onset of every humanitarian crisis. The MISP has five objectives[1]:

1. Ensure the health sector/cluster identifies an organization and a SRH coordinator to lead and coordinate the implementation of the MISP.
2. Prevent and manage the consequences of sexual violence.
3. Reduce HIV transmission.
4. Prevent excess maternal and newborn morbidity and mortality.
5. Plan for comprehensive SRH services, integrated into primary health care as the situation permits.

Neglecting the MISP in humanitarian settings has serious consequences: preventable maternal and newborn deaths; sexual violence and subsequent trauma; sexually transmitted infections; unwanted pregnancies and unsafe abortions; and the possible spread of HIV.

Nurses, midwives, and doctors working in emergencies provide the clinical services needed to achieve objectives 2, 3, and 4 of the MISP. These services include clinical management of survivors of sexual violence and basic emergency obstetric care, while ensuring infection prevention practices at all times in all clinical settings.

The IAWG designed a series of short clinical refresher outreach training modules in order to reinforce previously acquired knowledge and skills of health care staff tasked with providing these services. This *Assisted Vaginal Delivery via Vacuum Extraction* module is one of the refresher training modules.

Objective

The objective of this *Facilitator's Guide* for the module on *Assisted Vaginal Delivery via Vacuum Extraction* is to guide clinical trainers in conducting short face-to-face trainings in crisis settings in order to refresh health care providers' knowledge and skills on performing vacuum extraction for prolonged labor.

Target Audience

This training program is designed for clinical service providers, including midwives, nurses or other mid-level providers, general practice physicians, and obstetricians/gynecologists who are currently attending or will attend deliveries in crisis settings.

Competency Assessment

This session is meant as a refresher course for providers with existing skills. Trainers should assess both knowledge and skills to determine the competency of each participant. The pre- and post-tests serve as knowledge assessments. The *Vacuum Extraction Checklist* contained in this module can be used to assess skills during simulated practice. Trainers should identify clinical service providers deemed competent to practice vacuum extraction and candidates who require further proctored supervision prior to performing the intervention.

[1] The MISP will be revised in 2017. Please be aware that this content is subject to modification.

Participant Prerequisites

At minimum, participants should already be able to:

- Demonstrate knowledge of the female reproductive system.
- Know how to take a medical history and conduct a physical exam.
- Accurately assess the position and station of the fetal head and dilatation of the cervix during sterile vaginal exam.
- Recognize and manage complications of labor.

Ideally, participants should already be able to:

- Describe the key concepts of birth via vacuum extraction.
- Describe the circumstances in which birth via vacuum extraction is indicated.

Description of the Facilitator's Guide

This facilitator's guide includes presentation slides, case studies, and simulation activities. It provides information on the necessary skills for provision of assisted vaginal delivery via vacuum extraction and includes resources for further study.

This training module is divided into six units. Each unit includes the following elements:

1. **Time:** an estimate of how long it should take to complete the unit;
2. **Objectives:** specific objectives to be met by the end of each unit;
3. **Materials:** copies of all learner materials for distribution and answer keys for trainers; and
4. **Instructions:** a list of the handouts, presentations, and other resources needed for each activity, followed by step-by-step guidance on how to facilitate interactive learning.

Trainers are highly encouraged to adapt the units to fit local training needs and objectives. This course is designed to be delivered by at least two trainers. The nature of the competency-based activities and concurrent simulation sessions requires more than one trainer to successfully implement the course.

In this guide, slide presentations are organized with a thumbnail image of the slide on the left and facilitation notes directly beside it on the right side of the page. Instructions walk the trainer through points to emphasize and the interactive portions of the presentation.

Documentation and Certificate

Trainers should document attendance of participants and present certificates of attendance at the end of the course. Participants will also complete both a multiple-choice pre-test and post-test on their knowledge in this area.

Participant Evaluation

An informal process evaluation is recommended at the end of each workshop day to assess participant satisfaction with the topics and activities. At the end of the course, participants should complete the final evaluation to provide feedback for future trainings.

Sample Agenda

This is an example of an agenda for the refresher training on using vacuum extraction for assisted vaginal delivery. Trainers may need to adjust the order of some content and the time allowed based on the setting and experience level of the participants. There is a printable version of the *Course Agenda* on the accompanying USB key and IAWG website.

UNIT	TIMING	CONTENT	OBJECTIVES *At the end of the unit, participants will be able to:*	METHODOLOGY
Day 1				
	8:00-8:30 (30 minutes)	Registration of participants		
Introduction				
1	8:30-9:15 (45 minutes)	Course overview • Icebreaker • Expectations and ground rules • Pre-test	• reflect on their expectations of the training • understand the objectives of the training • agree on the ground rules of the training	
Theoretical knowledge				
2	9:15-10:15 (60 minutes)	Labor assessment and vacuum extraction overview	• explain why vacuum extraction is an important clinical care service to offer in crisis settings • describe the indications, conditions, and contraindications for vacuum extraction • identify different interventions for unsatisfactory progress of labor • describe the benefits and risks of different types of vacuum extractors	Presentation
	10:15-10:30 (15 minutes)	Break		
3	10:30-12:00 (90 minutes)	Vacuum-assisted birth in crisis settings	• describe the anatomy of the fetal head as it relates to fetal presentation during labor • identify the flexion point of the fetal head and fetal presentation during labor • describe the preparation for and procedure of vacuum extraction • verbalize safety considerations for performing vacuum extraction • describe potential maternal and fetal complications of birth assisted by vacuum extraction • describe post-procedural care for women and newborns	Presentation Video
	12:00-1:00 (60 minutes)	Lunch		

UNIT	TIMING	CONTENT	OBJECTIVES *At the end of the unit, participants will be able to:*	METHODOLOGY
	1:00-1:15 (15 minutes)	Morning recap		
Hands-on activities				
4	1:15-2:45 (90 minutes)	Practical Sessions A and B • Group 1: Session A - Vacuum extraction demonstration • Group 2: Session B - Case study	Session A • understand the procedure of vacuum extraction step-by-step using pelvic models • practice vacuum extraction using pelvic models Session B • make clinical decisions through: 1. assessment 2. clinical problem identification 3. intervention 4. reassessment	Demonstration Group exercise
	2:45-3:00 (15 minutes)	Break		
4	3:00-4:30 (90 minutes)	Practical Sessions A and B • Group 1: Session B - Case study • Group 2: Session A - Vacuum extraction demonstration	Session B • make clinical decisions through: 1. assessment 2. clinical problem identification 3. intervention 4. reassessment Session A • understand the procedure of vacuum extraction step-by-step using pelvic models • practice vacuum extraction using pelvic models	Group exercise Demonstration
	4:30-5:00 (30 minutes)	Group debriefing on case study Wrap up of the day		Discussion
	5:00-6:00 (60 minutes)	Free time for practice with pelvic models		

UNIT	TIMING	CONTENT	OBJECTIVES *At the end of the unit, participants will be able to:*	METHODOLOGY
Day 2				
	9:00 - 9:15 (15 minutes)	Recap of Day 1 Overview of Day 2		
Hands-on activities				
4	9:15 - 10:45 (90 minutes)	Practical Session C(&E) and D • Group 1: Session C - Newborn resuscitation and *Session E - Partogram (optional)* • Group 2: Session D - Practice performing vacuum extraction	Session C: • demonstrate newborn resuscitation using a bag and a mask *Session E:* • use the partogram to chart labor progress (optional) Session D: • demonstrate the preparation of the patient for vacuum extraction, including information and communication • demonstrate post-procedural care following vacuum extraction • practice all of the steps in vacuum extraction with peer support	Simulation Case studies Simulation
	10:45-11:00 (15 minutes)	Break		
4	11:00-12:30 (90 minutes)	Practical Session C(&E) and D • Group 1: Session D - Practice performing vacuum extraction • Group 2: Session C - Newborn resuscitation and *Session E - Partogram (optional)*	Session D: • demonstrate the preparation of the patient for vacuum extraction, including information and communication • demonstrate post-procedural care following vacuum extraction • practice all of the steps in vacuum extraction with peer support Session C: • demonstrate newborn resuscitation using a bag and a mask *Session E:* • use the partogram to chart labor progress (optional)	Simulation Simulation Case studies

UNIT	TIMING	CONTENT	OBJECTIVES *At the end of the unit, participants will be able to:*	METHODOLOGY
	12:30-1:30 (60 minutes)	Lunch		
Evaluations				
5	1:30-2:00 (30 minutes) 2:00-4:00 (120 minutes)	Post-test Competency-based assessments	• demonstrate theoretical competence in assisted vaginal delivery via vacuum extraction • demonstrate competence in assisted vaginal delivery via vacuum extraction using pelvic models	Test Individual competency assessment
Closing				
6	4:00-4:45 (45 minutes)	Closing • Certificate of completion • Post-test • Course evaluation	• explain how the training met participants' expectations and course objectives	

Preparation for a Training

Trainers should work through the two tables below that outline the preparatory work that must be undertaken to successfully implement a training.

Course Materials List

This training module is designed to utilize the supplies that are available within the Inter-agency Reproductive Health (RH) Kits, which should be available on-site at the time of your training.

The following is a complete list of all of the medical equipment and course supplies that are needed for the successful implementation of the course. Verify the medical equipment that is already available at the training venue and make arrangements to bring any missing supplies with you.

Please note that the maternal and baby simulators are the responsibility of the facilitator and will need to be brought to and from the training location. It is recommended that the trainers bring two pelvic models to the course. Please plan accordingly for the transport of these goods.

Course Materials Checklist

MEDICAL EQUIPMENT	QTY	CHECK
OmniCup	2	
Bird manual vacuum extractor with Bird anterior and posterior cups	2	
Clean delivery kit	10	
Delivery set in stainless steel box (scissors and 2 Kocher clamps)	3	
Sterile gloves	50	
Examination gloves	50	
Sterile gauze compress	100	
Antiseptic (chlorhexidine) 1L	2	
Gallipot	3	
Mucus extractor, 20 mL	4	
Cord clamps	20	
Medical drapes for deliveries	10	
Pelvic models	2	
Urethral catheter, straight, 12 Fr	2	
Water-based lubricant, 200 mL bottle	2	
Talcum or baby powder	2	
Neonatal simulator	2	
Neonatal resuscitation kit with bag and mask	2	
Dish soap	1	
STATIONARY	**QTY**	**CHECK**
Pens	25	
Notebooks	25	
Flip chart paper and stand	2	
Markers for flip chart	5	
Rubbish bin	1	

Advance Preparation Checklist

Use the following checklist to ensure that all the necessary materials are prepared in the week before delivering the training:

Item to prepare	Unit	Complete
Check projector for image and sound quality of videos and presentations	General	
Review all slide presentations, hiding the optional slides if not needed in your context	General	
Review the instructions and answer keys for all activities	General	
Check that all course materials, including equipment for vacuum extraction, are available and ready to use	General	
Ensure pelvic simulation models are set up and ready to be used	General	
Flip chart sheets on: Ground rules, Parking lot, Icebreaker (if adapting)	General	
Print, and staple if needed, one copy of the following handouts for each participant:		
• Course agenda	1	
• Pre-test	1	
• Checklist for vacuum extraction	4	
• Case study – worksheet	4	
• Case study – answer key	4	
• Newborn resuscitation checklist	4	
• Partogram – 3 copies per participant	4	
• Partogram instructions	4	
• Partogram answer key	4	
• Vacuum extraction checklist – one copy per participant for facilitator use during competency assessment	5	
• Post-test	5	
• Certificate of attendance	6	
• Course evaluation	6	

Note to Trainer: If slide presentations are not possible, trainers may copy the slides onto transparencies or use photocopies as handouts.

Further Reading:

- Vacca, Aldo, *Handbook for Vacuum Delivery in Obstetric Practice*, 3rd Edition. Brisbane: Vacca Research, 2009.
- Inter-agency Working Group of Reproductive Health in Crises, *Inter-agency Field Manual for Reproductive Health in Crises*, Ch. 6, Maternal and Newborn Health. 2010.
- World Health Organization, *Managing Complications in pregnancy and childbirth: A guide for midwives and doctors,* Geneva. 2003

Accompanying USB

The accompanying USB key includes several resources to be used in the workshop activities, including all handouts and slide presentations. The key also includes sample certificates of completion and competence, which trainers can personalize in Microsoft Word.®

These training materials and recommended publications are also available for download at www.iawg.net/tpi-home or by contacting training@iawg.net.

Characteristics of an Effective Training

The following recommendations are necessary to ensure the effective transfer of information during adult learning:

- Clearly communicate the purpose of the training to both trainers and learners;
- State exactly what learners are expected to do at the end of the course;
- Use training methods that build on participants' existing skills and experience, enabling them to meet the objectives;
- Present new knowledge and skills in a relevant context;
- Actively engage learners in the process;
- Use an effective mix of training methods to meet the needs of different learning styles;
- Offer learners the opportunity to practice applying new knowledge and skills;
- Provide learners with constructive feedback on their performance;
- Allow enough time for learners to meet the objectives of the training; and
- Offer trainers and learners the opportunity to evaluate the course, measuring the extent to which trainers and learners met the training objectives and accepting feedback from learners to make improvements to the course.

From: Ipas, Women-Centered Postabortion Care: Reference Manual, Second Edition. Chapel Hill. 2013.

Alert: Important recommendations for before and after the training

This module is designed to be a a 2 or 3-day clinical refresher training for already trained health care service providers in humanitarian contexts. The IAWG Training Partnership Initiative conducted research about the barriers and facilitators to implementing such trainings in crises settings, and has the following recommendations **for trainers and program managers**:

- *Before the training:*
  - Limit the selection of participants to those who meet the specified prerequisite qualifications in the facilitator's guide.
  - Assess qualified participants' learning needs to prepare for how best to address knowledge gaps. To do so, use the pre-test included in the *Assisted Vaginal Delivery via Vacuum Extraction* module or interview participants.
  - Based on identified trainees' needs, provide additional training resources to expand the training as needed.
  - Ensure that participants become certified in the MISP Distance Learning Module (available at http://iawg.net/minimum-initial-service-package/) as a foundation prior to the training, if possible.
- *After the training:*
  - Discuss and possibly organize a log book and a calendar of opportunities for trainees to practice their skills at their institution.
  - Regularly schedule ongoing supportive supervision for the providers as soon as the security situation allows.

For more information, please see the following guidance note: *Sexual and Reproductive Health Clinical Outreach Refresher Trainings (S-CORTs): Operational considerations and programmatic guidance for SRH trainers, program managers, and coordinators.*

Assess Participants

It is important to assess the experience of participants prior to finalizing the training participant roster. Only fully-qualified clinical service providers who are currently attending normal and complicated deliveries are eligible for this short refresher course. To attend this course, participants must already be competent in assessing cervical dilatation, fetal lie, and fetal descent. They should also be familiar with using the partogram.

If you find that there is a need for a basic vacuum extraction training for clinicians with no experience:

- Advise the organizing agency to plan for an extended training.
- Inform the IAWG Training Partnership Coordinator (training@iawg.net).
- Recommend that the agency organize a basic EmONC signal functions training.

Note to Trainer: In crisis settings, refresher courses typically take place on-site. Be sure to bring all supplies to the training, including paper certificates, copies of handouts, and additional resources in paper format. Bring paper copies of slides and extra flip chart paper as backup.

Sensitivity and Flexibility in a Crisis Setting

Sensitivity and flexibility are crucial in a crisis setting. When planning this training, trainers should keep the following things in mind:

- Minimize the time providers spend away from their duty stations.
- Be sensitive to long hours and double shifts health care providers may be working.
- Remember that some participants may have long travel times.
- Be prepared for participants who have a range of abilities and experience — some may be very new to the current setting.
- Be aware that attendees will most likely be a mix of nurses, midwives, doctors, and clinical officers.
- Be sensitive to the emotional needs of health care providers/participants in a crisis setting.
- Remember that some providers may be experienced using vacuum extraction but inexperienced doing so in a crisis setting.

Introduction

Unit 1: Course Overview

Time

45 minutes

Objectives

At the end of this unit, participants will be able to:

- Reflect on their expectations of the training.
- Understand the objectives of the training.
- Agree on the ground rules of the training.

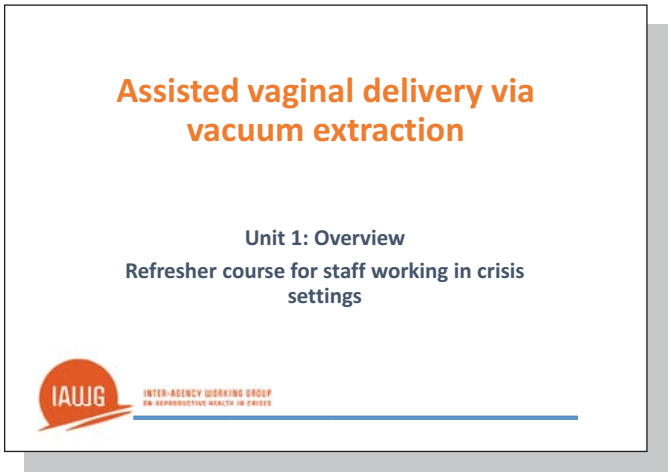
Materials

- Two flip charts: 1 titled *Ground Rules* and 1 titled *Parking Lot* on which you should draw a car at the top of the sheet
- Handouts: *Course Agenda*, one for each participant
- Markers in various colors, with 3 or 4 on each table
- Post-it notes in various colors, with 3 or 4 Post-it packets on the tables

Instructions

Place the *Course Agenda*, markers, and Post-it notes on the tables for the participants prior to beginning the unit. There may be some formal opening requests from national dignitaries. Please try to accommodate such requests in the shortest time possible.

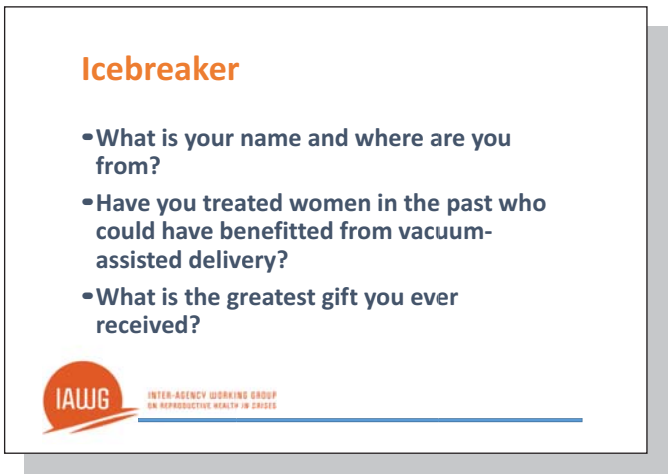
Presentation



Greet participants warmly and start the slide presentation for Unit 1: Overview.

Welcome to the refresher course for providing vacuum extraction in crisis settings. This is a refresher course for health care providers who are already familiar with vacuum extraction.

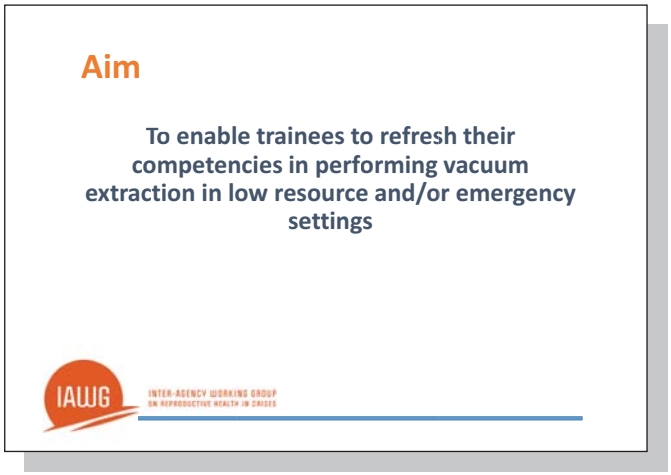
Introduce yourself and the other facilitator(s). Give a summary of your qualifications. Thank the participants for attending the course despite pressing schedules and difficult circumstances.

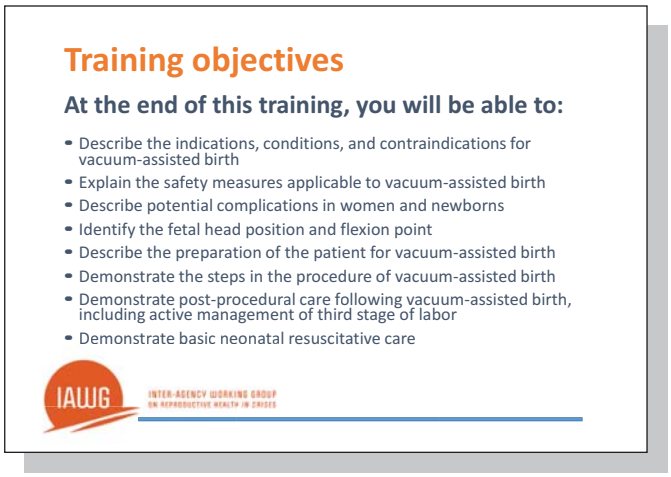


Ask the participants to find a partner. After two more minutes, ask participants to introduce their partners to the whole group in 30 seconds or less using these questions as a guide. You can use this slide or prepare a flip chart with the questions.

Pause after this icebreaker activity and bring a flip chart forward. Ask participants what they hope to learn in the course and write down their expectations on the flip chart.

- Review the expectations and identify those likely to be met.
- Point out any expectations that may be beyond the scope of the course.
- Keep the list to review with participants at the end of the course to ensure that realistic expectations were met.





Participants are expected to practice as much as possible over the next two days. Secure the room until one hour after the end of the training if possible, and inform the participants if there is time available for practicing with the models.

- Post the prepared flip chart "Course Agenda" on the wall and review the schedule.
- Refer to the agenda throughout the course to stay on topic and on time.
- Distribute a copy of the course agenda.
- Refer back to the participant expectations posted on the wall and circle what will be covered in this course and what may have to be addressed separately.
- Ask for a volunteer to be the timekeeper and prepare signs with 5-minute and 1-minute warnings.

Address the Following Before Wrapping up Unit 1:

Housekeeping

Tell participants where the restrooms are and encourage them to leave the training room quietly, if needed. Mention that there will be morning and afternoon breaks with a lunch in between.

Ground Rules

Present the flip chart entitled "Ground Rules":

- Explain that ground rules are mutually agreed upon guidelines to help the group work together, create a safe and respectful learning environment, and accomplish tasks efficiently.
- Ask participants to suggest ground rules. Write their suggestions on the flip chart.
- Possible ground rules may include participating, listening respectfully, speaking one at a time, turning off cell phones and pagers, and maintaining confidentiality.

Expectations and Agenda

Ask participants to write one to three expectations each on colored Post-it notes regarding what they hope to learn in the course. Have the participants put the notes on the wall or a flip chart that you have placed in the front of the room.

Parking Lot

Post the flip chart sheet on which you have drawn a car at the top. Explain that during the course, any questions that cannot be addressed at that time will be put in the "Parking Lot." Throughout the course you should refer back to these questions and address them when they are most relevant.

Knowledge Pre-test

Distribute the *Pre-test* (available on USB key and the IAWG website) and tell participants they have about 15 minutes to complete it. Ask them to write their names at the top and collect all tests at the end of the allotted time.

Theoretical Components

Unit 2: Labor Assessment and Vacuum Extraction Overview

Time

60 minutes (presentation)

Objectives

By the end of this unit, participants should be able to:

- Explain why vacuum extraction is an important clinical care service to offer in crisis settings.
- Describe the indications, conditions, and contraindications for vacuum extraction.
- Identify different interventions for unsatisfactory progress of labor.
- Describe the benefits and risks of different types of vacuum extractors.

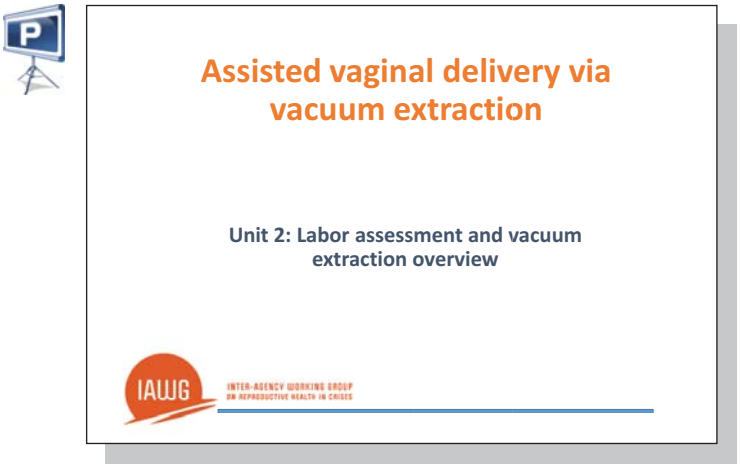
Materials

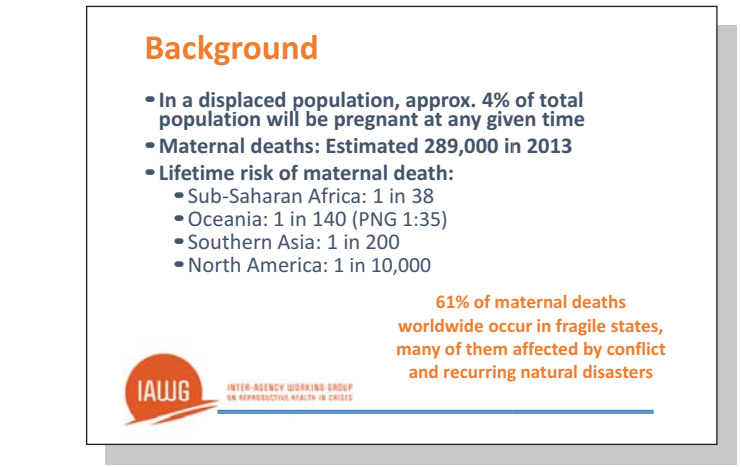
- Flip chart
- Markers
- Projector
- Laptop
- Vacuum extractors

Instructions

This unit begins with a PowerPoint presentation that provides an overview of when to consider an assisted vaginal delivery via vacuum extraction.

Presentation



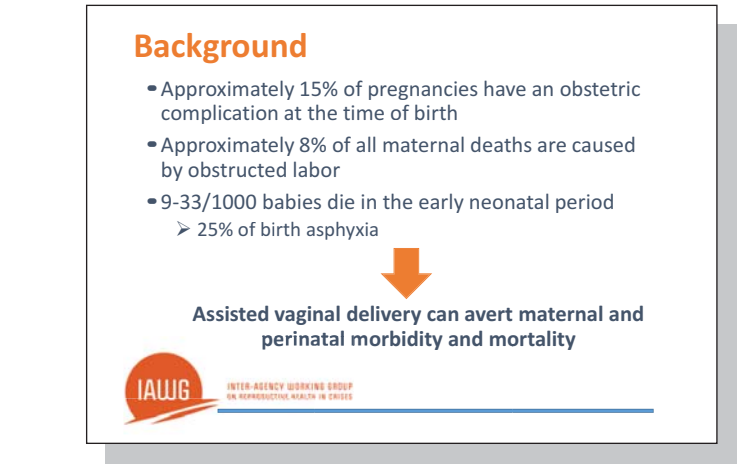


The World Health Organization (WHO) defines maternal death as:

"The death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes."

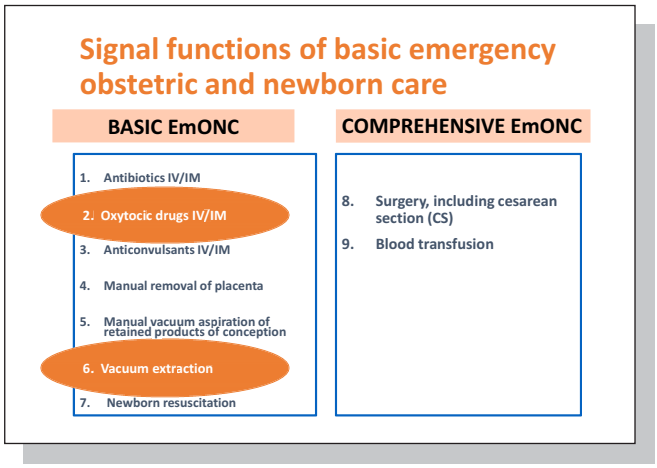
A comprehensive report on global maternal mortality published in 2014 shows a 45% reduction in maternal mortality world-wide between 1990 and 2013. In 1990, there were 589,000 maternal deaths. In 2013, there were 289,000 maternal deaths. Developing regions account for 99% of the number of maternal deaths (286,000). The majority of these maternal deaths – 61% of maternal deaths and 45% of neonatal deaths – continue to occur in fragile states, many of them affected by conflict and recurring natural disasters.

The adult lifetime risk of maternal death is defined as the probability that a 15-year-old woman will die eventually from a maternal cause, assuming she is subjected throughout her lifetime to the age-specific risks of maternal death observed for a given population in a given year.

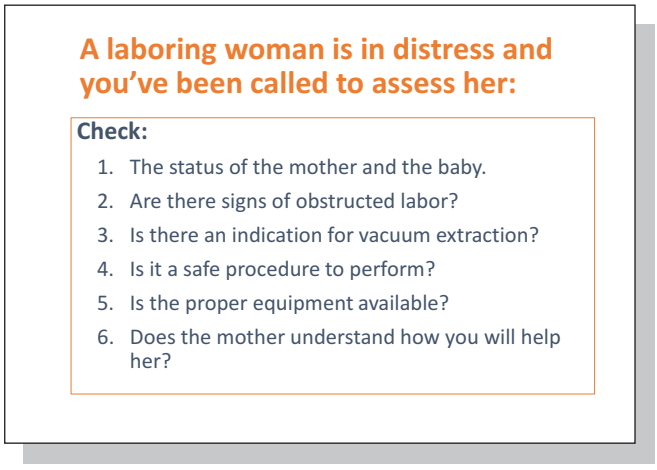


Approximately 15% of women have complications at the time of delivery, but we cannot predict which women these will be.

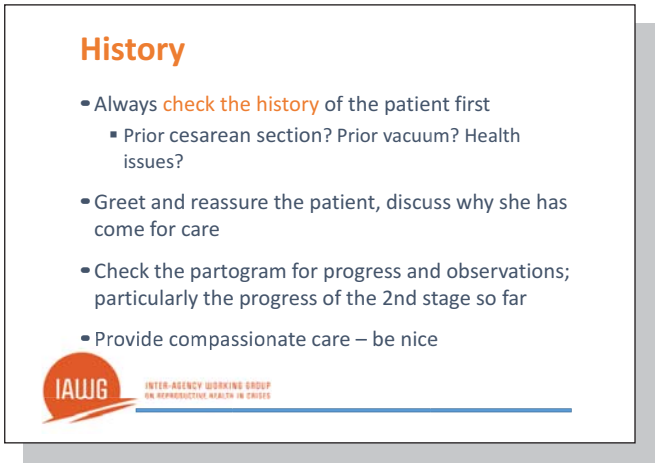
The early neonatal period is the first 6 days of the baby's life.



Vacuum extraction is one of the signal functions of basic emergency obstetric and newborn care (BEmONC) that should be readily available at community-level health facilities (1 facility per 30,000 people). The signal functions are the minimal competencies for health care providers when providing obstetric care at the basic and comprehensive levels.

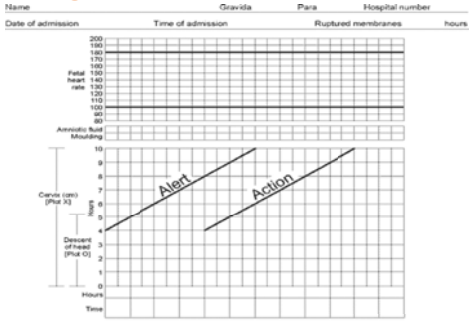


This presentation walks through each of the six steps outlined on this slide.



Always check the history of the patient first and discuss it with her to gain an initial clinical picture of the situation. Check any antenatal record and the progress of labor so far and examine the partogram, particularly the progress made in the second stage of labor, if she has one. Many patients may not have antenatal records available, in which case you might have to try to get basic information about the pregnancy from the woman's family, support persons, or guardians, or from the woman between contractions. See if the patient has any risk factors in her pregnancy.

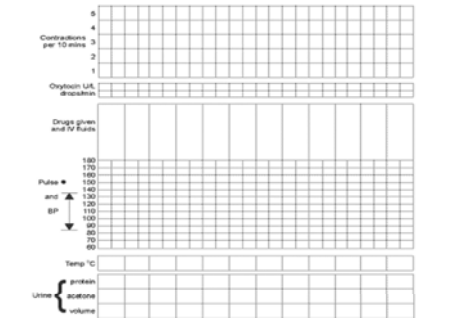
Partogram



Give a brief overview of the partogram using this and the following slide.

Note: There is a link to a video about the partogram (16 minutes) included in the training package. Watching the video and doing the associated exercises (see p. 63, Hands-on Activity E: Partogram) is at the discretion of the trainer based on the needs of the participants and time.

Partogram



The partogram (or partograph) is a structured, graphical representation of the progress of labor. It shows cervical dilatation in relation to time as well as descent of the fetal head. Space can be provided to write notes on items including: the frequency of contractions, fetal heart rate, maternal observations, and medication administration. By using it, the progress of labor can be seen at a glance on one sheet of paper. The partogram is a tool to identify when intervention is necessary, as failure to progress can be easily recognized.

Unsatisfactory progress in labor and the possibility of intervention is assessed when cervical dilatation is too far to the right of the alert line on the partogram.

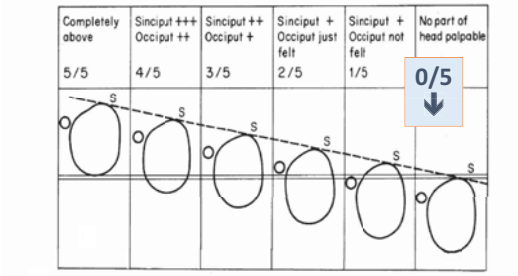
Physical Exam

Contractions: frequency and duration	Normal contractions in the active phase of labor have a frequency of 3 in 10 minutes lasting for 45 seconds. Inadequate contractions should be stimulated/augmented with oxytocin infusion before vacuum extraction procedure is commenced.
Abdominal examination	Fundal height in cm Presenting part and level of the fetal head Fetal heartbeat Estimated size of baby Estimated amount of fluid Cervical dilatation
Pelvic examination	Cervical effacement & application to presenting part Fetal head position and flexion Presence of caput and molding Cervical edema Descent/dilatation with and without a contraction Any signs of obstructed labor, vulval edema, Bandl's ring, active phase of labor more than 20 hours

Assess labor progress by considering the history of the patient in conjunction with the findings of your physical exam. At a minimum, the physical exam should include the contractions' frequency and duration, abdominal examination, fetal status, and pelvic examination. In cases of prolonged labor, always be alert to the possibility of obstructed labor.

Physical exam

Abdominal palpation for level of the head



Mola, G., Ed. 2010. *Manual of Standard Managements in Obstetrics and Gynecology for Doctors, HEOs and Nurses in Papua New Guinea. 6th Edition*

There must be NO head palpable on exam above the symphysis pubis by bimanual palpation, if you are going to attempt a safe, simple vacuum extraction.

A specialist obstetrician may find it appropriate to perform vacuum extraction when there is 1/5 of head above the symphysis pubis, if there is no excessive molding.

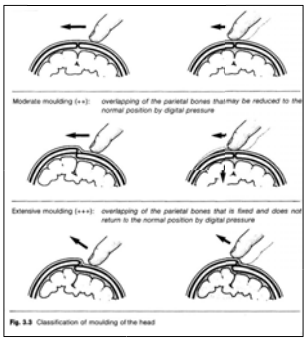
All practitioners who wish to become competent with vacuum extraction must become expert at diagnosing the level of the fetal head in the pelvis by abdominal, bimanual, and pelvic examination.

Physical exam

Degree of molding

- Mild (+)
- Moderate (++)
- Severe (+++)

Difficulty of vacuum extraction increases with amount of molding



Vacca, A. 2009. *Handbook of Vacuum Delivery in Obstetric Practice.* 3rd Ed. Vacca Research.

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Molding is a measure of the extent of compression to which the fetal head has been subjected during labor. A simple method of determining the degree of molding is by palpating the parietal bones and the degree of overlap that is present.

(A) **Mild Molding (+):** no overlapping of the parietal bones when palpating. If there is only mild molding present, the head will flex more easily with the first pull, descend more easily with the next pull, and rotate more easily.

(B) **Moderate Molding (++):** overlapping of the parietal bones that may be reduced to the normal position by digital pressure.

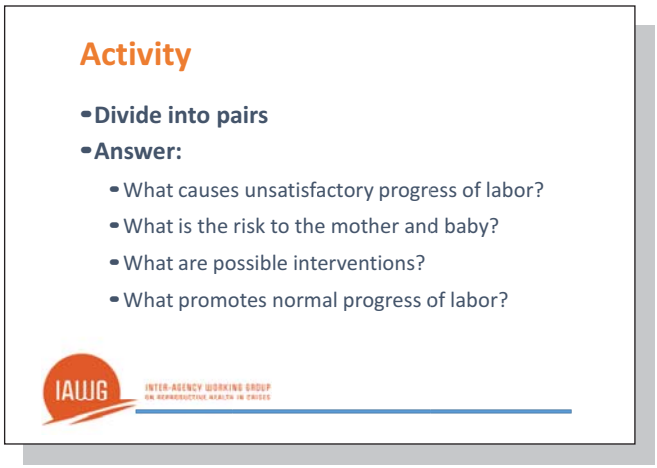
(C) **Severe Molding (+++):** overlapping of the parietal bones that is fixed and does not return to normal position by digital pressure. With severe molding there is less room for flexion, descent, and rotation of the head to occur.

A laboring woman is in distress and you've been called to assess her:

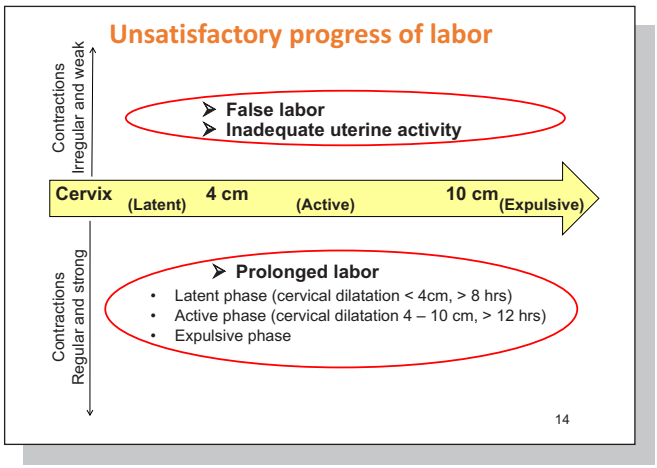
Check:

1. The status of the mother and the baby
2. Are there signs of obstructed labor?
3. Is there an indication for vacuum extraction?
4. Is it a safe procedure to perform?
5. Is the proper equipment available?
6. Does the mother understand how you will help her?

Prepare the participants for a discussion of the signs of true obstructed labor.



Use these questions as an introductory exercise to gauge the knowledge of the group. Ask the group to divide into pairs and discuss the questions for seven minutes. Reconvene the full group and write down the causes and interventions put forward by the group on the flipchart before moving on to the following two slides that summarize obstructed labor.

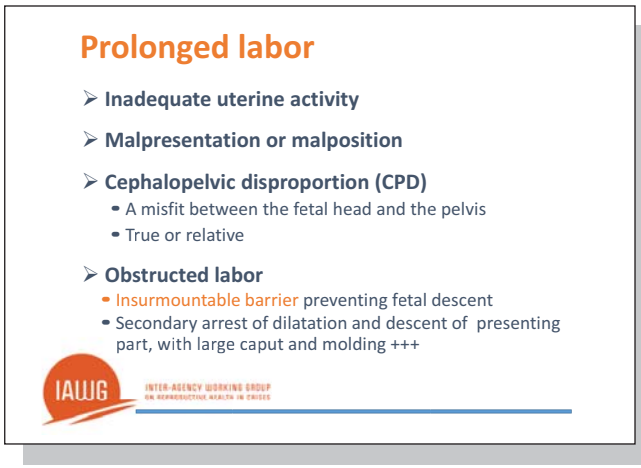


Unsatisfactory progress of labor can be a sign of prolonged labor and an early sign of obstructed labor. Assessment will help to identify the **cause of unsatisfactory progress** and subsequently determine whether labor is prolonged or obstructed.

Prolonged labor: Prolonged labor is defined as the onset of regular, rhythmical painful contractions accompanied by cervical dilatation where labor is longer than 20 - 24 hours. This definition has limitations. Therefore, it is more useful in terms of management, to refer to prolonged stages of labor, i.e. "prolonged latent phase of labor" or "prolonged active phase of labor."

The prolonged latent phase is the onset of regular painful contractions with cervical dilatation up to 3 cm. During the latent phase, the cervix becomes fully effaced. It should not be longer than 8 hours.

Prolonged active phase is regular painful contractions with cervical dilatation of more than 3 cm. It should not last longer than 12 hours without full assessment in a facility able to offer management and treatment of complications. In fact, dilation of the cervix is usually more than 1 cm per hour in the active phase. Therefore, most active phases last less than 6 hours.

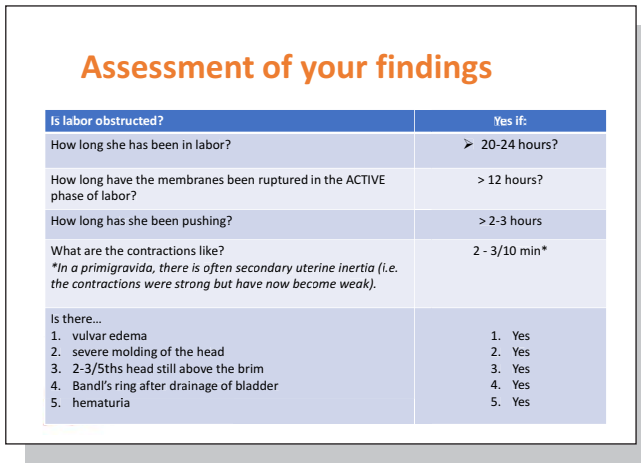


History and examination are used to diagnose the causes of prolonged labor and to differentiate between obstructed and prolonged labor.

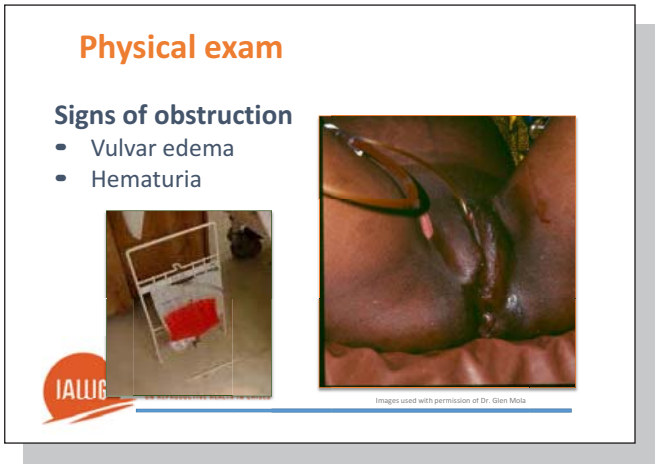
Malpresentation or malposition is any presentation other than vertex with occiput anterior. A **transverse fetal lie** is usually incompatible with vaginal delivery unless the fetus is very small (i.e. <~1kg).

Cephalopelvic disproportion (CPD): A misfit between the fetal head and the pelvis. This means it is difficult or impossible for the fetus to pass safely through the pelvis for mechanical reasons. CPD can be true or relative. **True CPD** occurs when the smallest diameter of the presenting part is too large to pass through the pelvis and operative delivery will be necessary. Most CPD is due to deflexion of the fetal head (and therefore mostly in association with a posterior position). **Relative CPD** occurs when there is a malpresentation of the fetal head, such as a posterior position or compound hand or face presentation, causing a larger presenting diameter of the head. The latter is common with posterior positions of the occiput. The vacuum extractor is able to correct deflection when the cup is placed on the flexion point. In relative CPD, strong contractions, relaxation of the pelvic joints, and molding of the fetal skull may enable the fetus to pass through the pelvis or be assisted through the pelvis by vacuum extraction. The vacuum extractor has the capacity to increase the flexion of the fetal head so that it can overcome relative CPD.

Obstructed labor: Obstructed labor means that, in spite of strong contractions of the uterus, the fetus cannot descend through the pelvis because there is an insurmountable barrier preventing its descent. Obstruction usually occurs at the pelvic brim, but occasionally it may occur in the cavity or at the outlet of the pelvis. In obstructed labor, the woman is at risk of dehydration, intrauterine sepsis, and death due to uterine rupture or septicemia. Give an IV of normal saline resuscitation fluid (2-3 liters), commence broad spectrum antibiotics, and insert an indwelling catheter (IDC).



The combination of her history and physical exam will help you decide if she has truly obstructed labor and requires referral to another level of care.

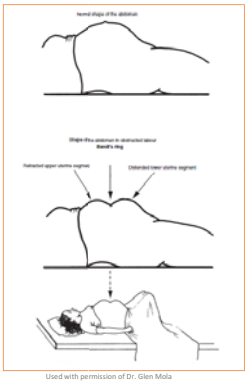


Vulvar edema or hematuria may be signs of labor obstruction.

Physical exam

Bandl's ring

- Catheterize to empty the bladder. Leave catheter in place for transfer.
- Do not perform vacuum unless the head is on the perineum.
- **Refer urgently for cesarean section or perforate the fetal head if the baby is dead.**



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Bandl's ring is also called a pathological retraction ring and is a late sign associated with obstructed labor. It is the abnormal junction between the upper and lower uterine segments. After full cervical dilatation, further contractions cause the upper uterine segment fibers to shorten and become thicker. The lower segment then becomes stretched and thinner, which ultimately may lead to uterine rupture if not addressed. Put in a catheter as a first intervention to rule out a full bladder as a cause of the finding. If the ring is still present with an empty bladder, then an urgent cesarean section is needed. Refer. If the fetus is dead, the fetal head can be perforated to save the mother from risk of death from uterine rupture. This procedure will be discussed later in the presentation.

Plan if labor is obstructed:

- Ring for advice if possible
- **Prepare for transfer for CS**
- Explain to patient and family
- IV hydration
- Antibiotics if fever or membranes ruptured >18 hours
- Analgesia if available
- Transport in left side-lying position

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If labor is obstructed as per your findings in the assessment, then ring for advice and prepare to transfer the patient for a cesarean section (CS). Always get consent for tubal ligation if the woman does not want to have any more pregnancies after this one, when you are referring a woman for a CS.

Physical exam

- Check the fetal heart. Is the baby still alive?
- **If the baby has died and labor is obstructed, then it is important to perforate the fetal head as soon as possible to prevent maternal complications (i.e. maternal death from ruptured uterus or obstetrical fistula formation)**

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It is important to verify if the baby is still alive by checking for fetal heart tones.

If the baby has died and labor is obstructed, then it is important to help the woman push it out by making the baby's head smaller. Perforating the fetus' head with strong scissors allows its contents to drain out and the head can collapse a little, easing delivery.

If she is a multigravida, then hastening delivery decreases her risk of uterine rupture during the time it takes for a referral to another facility. If she is a primigravida, then this may shorten her pain and help prevent morbidity, such as fistula and sepsis.

Plan if the baby has died:

- Expedite delivery in the health center unless the patient can be immediately transferred to a higher level of care within an hour.
- Delay in helping the woman deliver can lead to maternal death from uterine rupture or permanent disability from obstetric fistula

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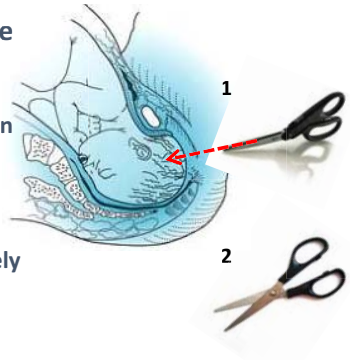
If the assessment has shown that the baby is dead, then it is best to move forward with the delivery by intervening to make the skull of the baby smaller.

Inform participants that some of the images on the following slides are graphic. The visuals showing the procedure (on slides 22-24) are optional.

To perforate the skull:

1. Make an incision by pushing sharp scissors into the dead fetus' head and opening and closing them widely a few times.



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This can be done quite easily when the head is visible on the perineum. Use sharp, strong scissors to push or punch the scissors through the skull to make a perforation (hole). After perforating the skull, open and close the scissors and rotate them around a number of times to facilitate the drainage of the skull contents. This allows the fluid skull contents to release and the skull to collapse. The procedure takes about 1 minute and the baby is often delivered within 60 minutes.

Before beginning this procedure, always counsel the woman and her family about what you need to do to save her life. Emphasize that the fetus is already dead, so you can no longer help it. You need to focus on saving the woman.

2. Rotate the open scissors 90°, and open and close a few times

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The next step is to rotate the open scissors 90 degrees, followed by opening and closing them a few times. The open-close motion of the scissors will allow the dead fetus' cerebrospinal fluid and dead liquid brain tissue to escape the skull. The head will then be smaller and able to deliver.

3. Grasp the fetal skull (sides of the hole you have made) with toothed grasping-forceps (volsellum, tenaculum, Kochers)

4. Apply traction during a contraction with the woman's pushing efforts

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Note that Kochers forceps are available in Inter-agency RH Kit 6 for Clinical Delivery Assistance.

A laboring woman is in distress and you've been called to assess her:

Check:

1. The status of the mother and the baby
2. Are there signs of obstructed labor?
3. Is there an indication for vacuum extraction?
4. Is it a safe procedure to perform?
5. Is the proper equipment available?
6. Does the mother understand how you will help her?

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Prepare the participants for a discussion of the difference between prolonged and obstructed labor.

Plan if prolonged labor:

Possible interventions depend on stage, cause, and condition of woman and fetus

- Supportive care, rehydration with IV normal saline
- Labor augmentation: oxytocic drug
- Assisted vaginal delivery: vacuum extraction
- Symphysiotomy in the second stage
- Cesarean section (CS)

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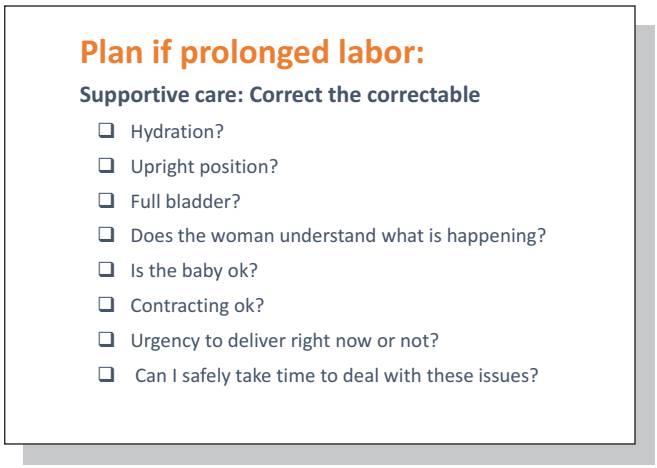
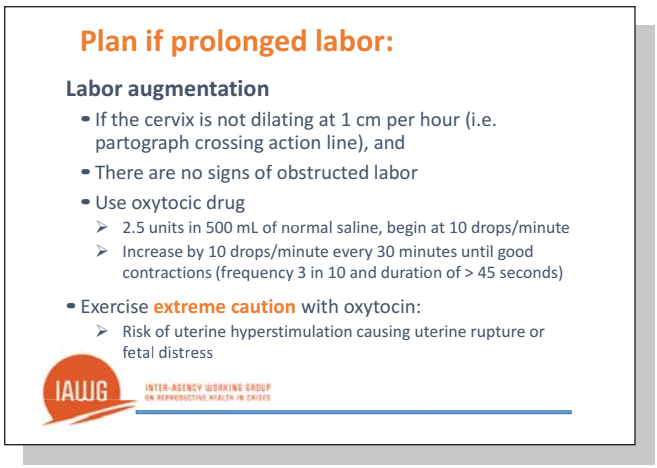
There are multiple possible interventions for prolonged labor.

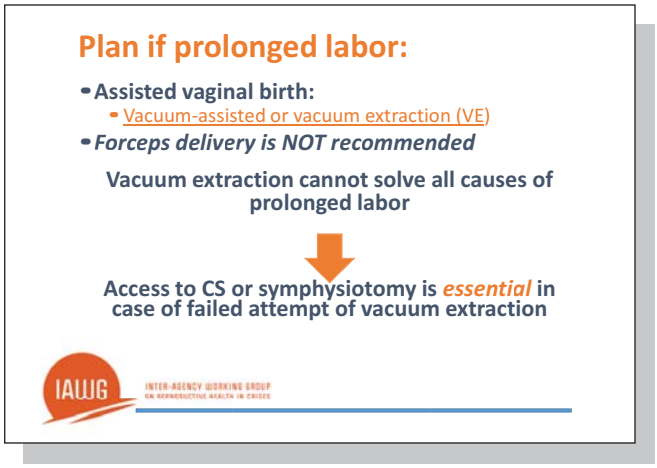
- **Supportive care:** Encourage ambulation, rehydration, and one-to-one emotional care
- **Augmentation of labor:** *Oxytocic drug (note the use of mifepristone/misoprostol is not recommended for the augmentation of labor)*
- **Assisted vaginal delivery:** Via vacuum extraction
- **Symphysiotomy:** An intervention that surgically divides the symphysis pubis under local anesthesia so that the pelvic diameter temporarily increases (up to 2 cm). Symphysiotomy can also be applied to deliver an entrapped head with a vaginal breech delivery. The risks of symphysiotomy include urethral and bladder injury, infection, and long-term difficulty walking and are often emphasized over the life-saving benefit of the procedure. When the procedure is performed by skilled practitioners, it should be safer and less dangerous than a cesarean section performed in the second stage of labor.



Do not rush if there is no need to rush. It is the hallmark of an experienced midwife and obstetrician to know when there is urgency (emergency) and when there is no need to rush.



Labor augmentation:
Oxytocin is included in Inter-agency RH Kits 6, 8 and 11 as 10 international units/mL in 1 mL ampoules and is meant for management of postpartum hemorrhage. The dose for augmentation is 2.5 international units in 500 mL IV fluid or 5 international units in a liter of normal saline. Draw out 5 international units in 0.5 mL and put in 1000 mL IV fluid and begin the drip rate at 10 drops per minute. Measure the contractions again after 20-30 minutes and increase the drip rate by 10 drops per minute if the contractions are still not adequate. Continue to increase the drip rate every 30 minutes (by 10 drops per minute) until the contractions are adequate (i.e. frequency 3 in 10 minutes and lasting for more than 45 seconds).



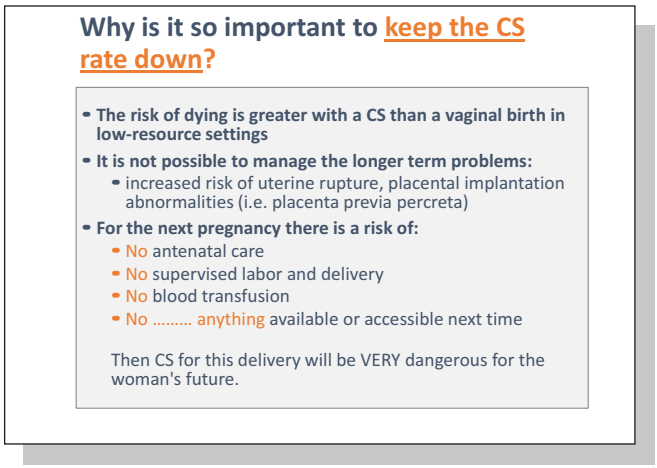
There are two types of assisted vaginal delivery: (1) vacuum extraction and (2) forceps delivery. Forceps delivery is no longer recommended by the WHO.

Assisted vaginal delivery can fail and access to cesarean birth should be considered before performing assisted vaginal delivery and/or performance of symphysiotomy.

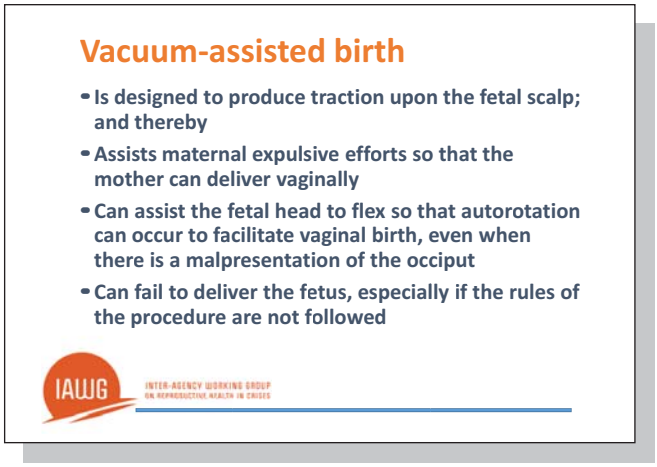
Please note: Assisted vaginal deliveries are not the ultimate method to solve prolonged labor. Vacuum extraction can occasionally fail to deliver the fetus.

This is why practitioners need to be keenly aware of the factors that make vacuum extraction likely to fail.

A vacuum extraction procedure should be considered a "trial procedure" if there is any head palpable above the brim of the pelvis on bimanual examination or there is molding+++ and the head is not already right down on the perineum.



Longer term problems from cesarean birth can be difficult to manage in low-resource settings. Placental abnormalities such as placenta previa, percreta, increta, or acreta will likely not be identified antenatally. It is difficult to provide appropriate care for a subsequent vaginal birth after prior cesarean birth because this requires at least secondary or tertiary obstetrical care.

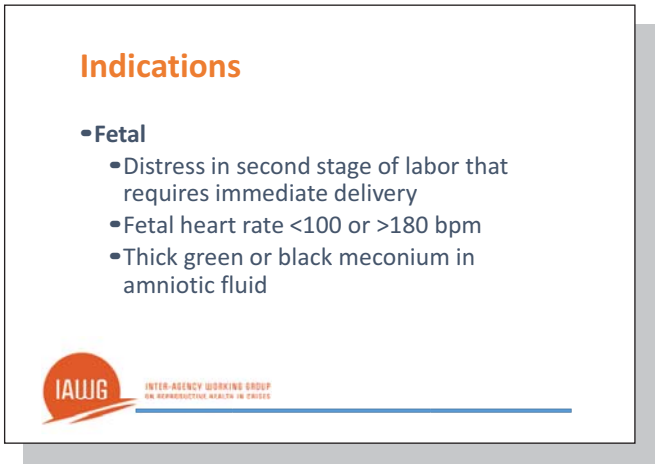


Produces traction upon the fetal scalp.

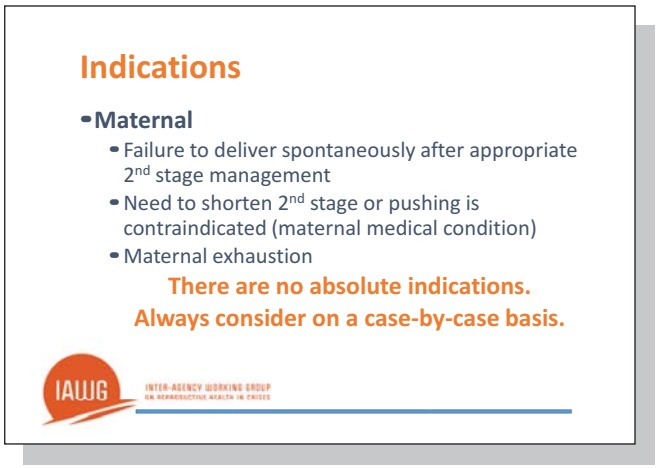
Assists maternal expulsive efforts.

If the cup is placed on the flexion point of the fetal head, then natural spontaneous (auto) rotation usually occurs.

Can fail to deliver the fetus if the rules are not followed or the cup is not placed on the flexion point.

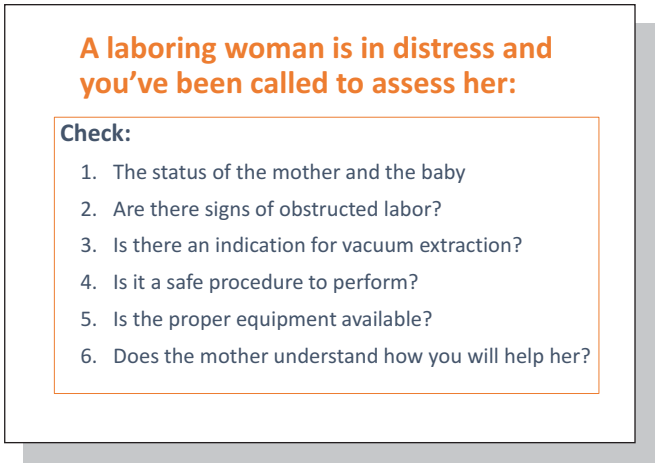


In the second stage of labor, fetal distress may be diagnosed. Vacuum extraction can be performed to shorten the second stage so that the baby does not become more distressed. Listen to the fetal heart rate every fifteen minutes in the presence of thick green or black meconium or after every contraction in the second stage.

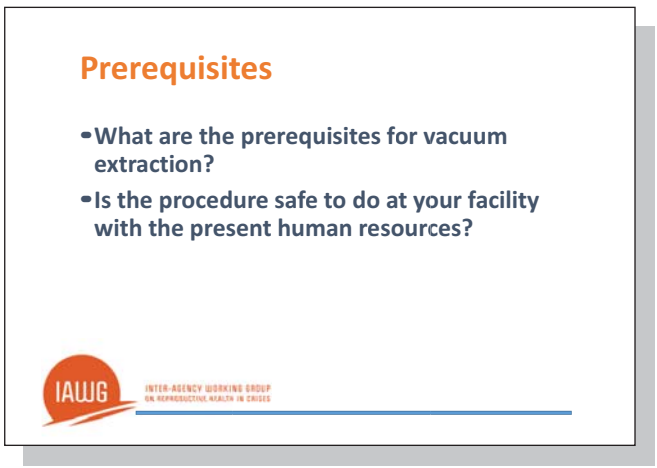


The most common reason that a woman requires assistance is delay in being able to push out her baby. If the second stage of labor lasts for more than 30 minutes in a multipara or more than 1 hour in a primigravida, staff trained to use vacuum extraction should be called or urgent referral should be made to a facility where intervention is possible (WHO, 2015).

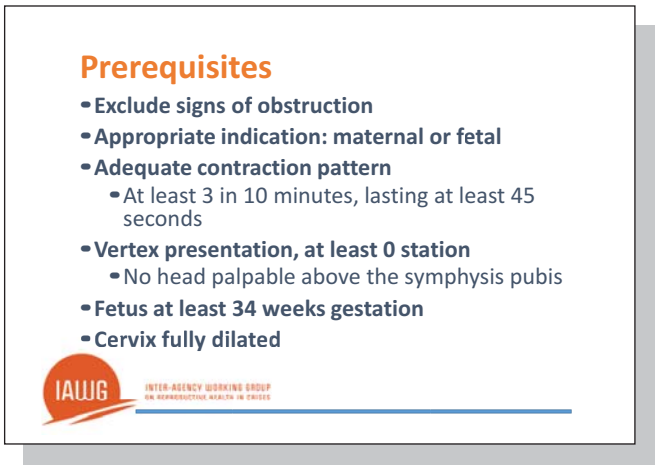
Some women should not push as much as this. Pushing can be dangerous if the blood pressure is up or she has heart or lung disease. In some cases, vacuum extraction assistance to expedite birth is indicated as soon as the woman becomes expulsive in the second stage.



Now that we have assessed the status of the mother and baby, and ruled out need for referral due to obstructed labor, we move on to the following questions: Is there an indication for vacuum extraction? Is it a safe procedure to perform in the given setting?



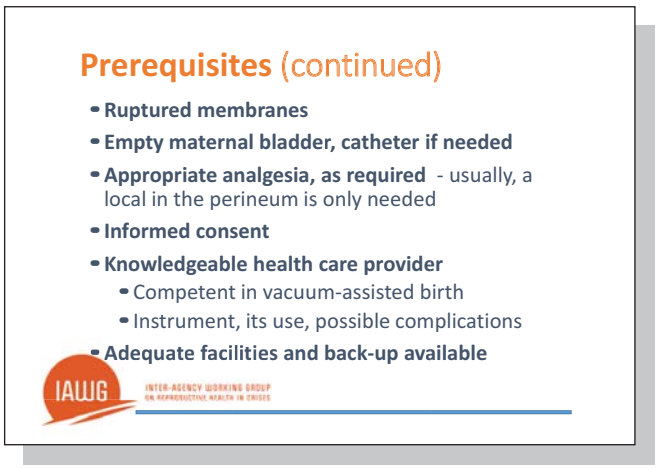
Pause on this slide and ask individual participants to name one prerequisite for vacuum-assisted delivery. Move on after the participants have named 4-5 prerequisites.



Once you have excluded signs of obstruction and identified an appropriate indication for performing vacuum delivery, it is important to assess whether the procedure can be safely done at your health facility.

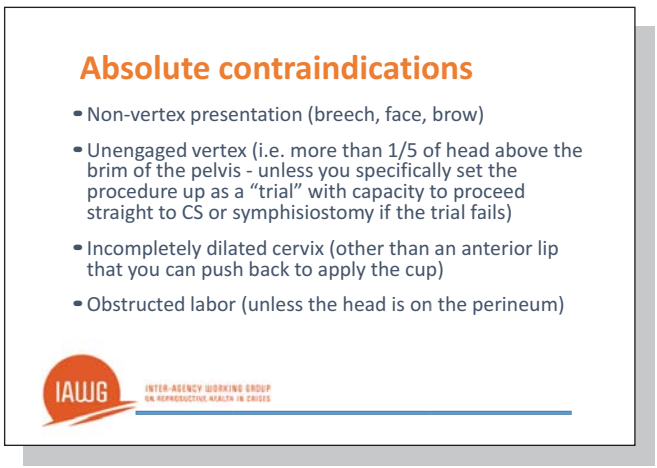
Check for:

- Strong contractions: There must be adequate, regular contractions. She needs an oxytocin drip if she is not having at least 3 contractions in 10 minutes that are lasting 45 seconds or more. For ALL primigravidas, strengthening the contractions prior to vacuum extraction will make the procedure easier for you and reduce the risk of failure.
- Vertex presentation: The fetal head is at least at 0 station and no head is palpable above the symphysis pubis/pelvic brim.
- The gestational age of the fetus is greater than 34 weeks by the best estimate available.
- The cervix is fully dilated.
- Empty maternal bladder: Insert a catheter if the bladder is not empty before you commence the procedure.



The clinical prerequisites are not the only pre-conditions that must be in place to attempt an assisted vaginal delivery with a vacuum extractor. The facility and the knowledge of the attending health care provider are important considerations for the safety of the patient.

Prepare for possible postpartum hemorrhage and need for resuscitation of the newborn.



Contraindications highlight the risk/benefit balance of a particular procedure. An absolute contraindication is a situation that makes vacuum-assisted birth absolutely inadvisable, meaning the risk to the mother and/or baby always outweighs the benefit.

At the last bullet, ask participants to name signs of obstructed labor. Remind them of: the formation of a uterine retraction ring, edema of the cervix and vulva, bloodstained urine, and tenderness and ballooning of the lower uterine segment. Clinical evidence of cephalopelvic disproportion: may be severe or increasing molding of the head and a high presenting part that fails to descend despite uterine contractions.

Relative contraindications

- Mid-pelvic station (1-2/5 of head still palpable above the brim of the pelvis)
- <34 weeks gestation
- Competence of provider (inexperienced provider should only attempt the most straightforward and simple procedures)
- Availability of referral facility or senior person to provide backup

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A relative contraindication is a situation where vacuum-assisted birth is potentially inadvisable unless you think there is a good chance of success, or you have set up for an alternative method of delivery (i.e. cesarean section or symphysiotomy) before you commence the the vacuum extraction trial. The risks and benefits should be closely weighed in the context of multiple aspects of clinical decision making.

More skill is needed to deliver a fetus from a higher station. The mid-pelvis is defined as when there is any head palpable above the brim of the pelvis up to 2/5. At this level, the fetal cranium is 0 cm to +1 cm (station) in relation to the ischial spine.

A laboring woman is in distress and you've been called to assess her:

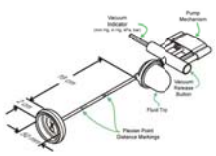
Check:

1. The status of the mother and the baby
2. Are there signs of obstructed labor?
3. Is there an indication for vacuum extraction?
4. Is it a safe procedure to perform?
5. Is the proper equipment available?
6. Does the mother understand how you will help her?

The discussion now moves on to having the appropriate equipment available and ensuring appropriate communication with the mother.

Equipment

Single operator cup



Conventional VE
Assistant creates vacuum manually

Narang Medical LTD

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Show the vacuum extractor and name the three parts. Circulate the vacuum extractors around the room for the participants to examine if you have enough of them.

There are various models. All models consist of:

- A metal or plastic cup
- A traction device
- A vacuum system which creates the suction manually or electrically

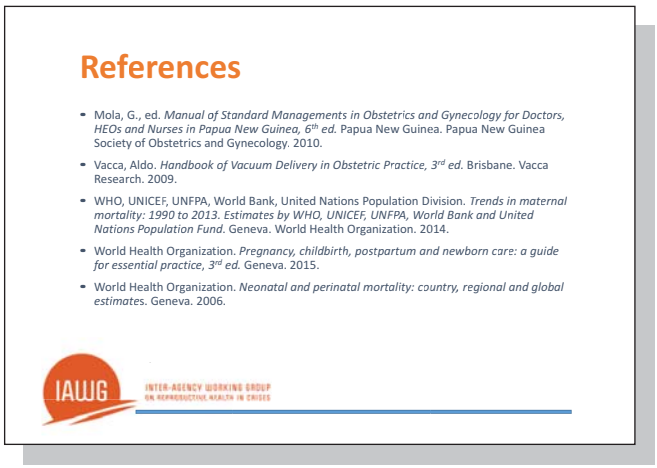
The hand-held reusable OmniCup is a single-operator system. It is available from Clinical Innovations LLC, USA. Conventional manual vacuum extractors, such as the modern Bird or the old-fashioned (obsolete) Malmstrom, need an extra assistant to create the vacuum by pumping or switching on an electric pump. The Inter-agency RH Kits contain the Bird vacuum extractor (UNICEF reference no. S0791501, Bird vacuum extractor).

Manual vacuum systems are preferred in humanitarian settings in case of a non-existing or unstable supply of electricity.

The Inter-agency RH Kits include hard cups. You may encounter soft cups in supplies that are provided by other organizations or specific donors. Soft cups are associated with higher failure rates and may cause more damage to the fetal head due to the extra traction that must be exerted to effect delivery.

The top row of cups in the picture show the various kinds of metal cups. In the middle of the row are the Bird anterior and posterior cups.

The bottom row shows various kinds of soft and mainly stemmed (and therefore un-maneuverable) cups. These cups are often ineffective because you cannot place them on the flexion point for any case other than very low station/level and anterior positions. Therefore, they are associated with high risk of delivery failure.



At the conclusion of the presentation, ask for any questions and continue to place any questions that will be addressed later in the training into the parking lot.

Unit 3: Procedure

Time

90 minutes (presentation)

Objectives

At the end of this unit, participants will be able to:

- Describe the anatomy of the fetal head as it relates to fetal presentation during labor.
- Identify the flexion point of the fetal head and fetal presentation during labor.
- Describe the preparation for and procedure of vacuum extraction.
- Verbalize safety considerations for performing vacuum extraction.
- Describe potential maternal and fetal complications of birth assisted by vacuum extraction.
- Describe post-procedural care for women and newborns.

Materials

- Slide presentation
- OmniCup
- Bird vacuum extractor
- Video (available on the USB key or IAWG website)

Instructions

This unit consists of a slide presentation reviewing how to conduct assisted vaginal delivery via vacuum extraction. The vacuum extraction equipment and anatomical models should be available to show to participants during the presentation. During this unit, you will explain the procedure and show a short video of vacuum extraction.

The demonstration of vacuum extraction using the model is completed in Practical Session A.

Presentation

Assisted vaginal delivery via vacuum extraction

Unit 3: Introductory Knowledge for the Vacuum Extraction Procedure

Refresher course for health care providers working in crisis settings

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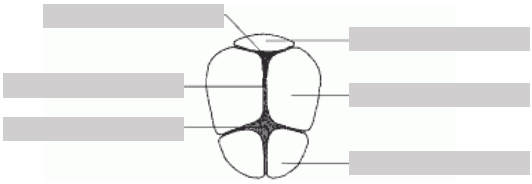
Anatomy of the fetal head



World Health Organization. Managing complications in pregnancy and childbirth: A guide for midwives and doctors. Section 1 - Clinical Principles.

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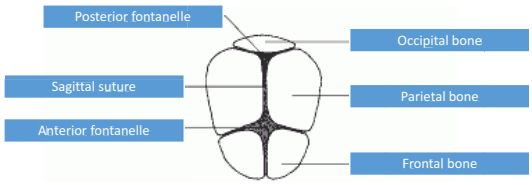
The first slide appears as an anatomical image of the fetal head without labels. Ask the participants to name the anatomical reference marks one-by-one. Move on to the next slide with the labels.

Anatomy of the fetal head



World Health Organization. Managing complications in pregnancy and childbirth: A guide for midwives and doctors. Section 1 - Clinical Principles.

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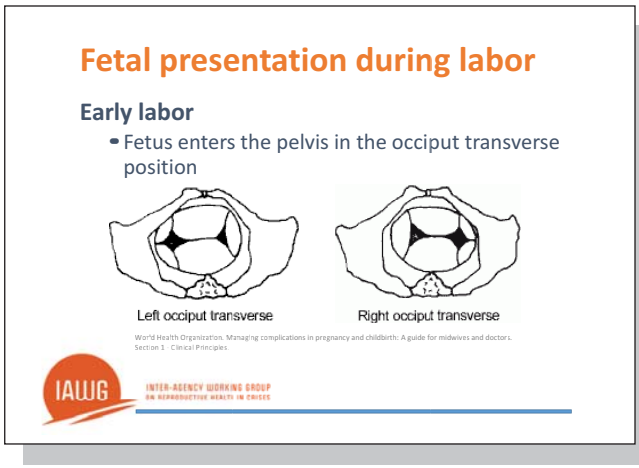
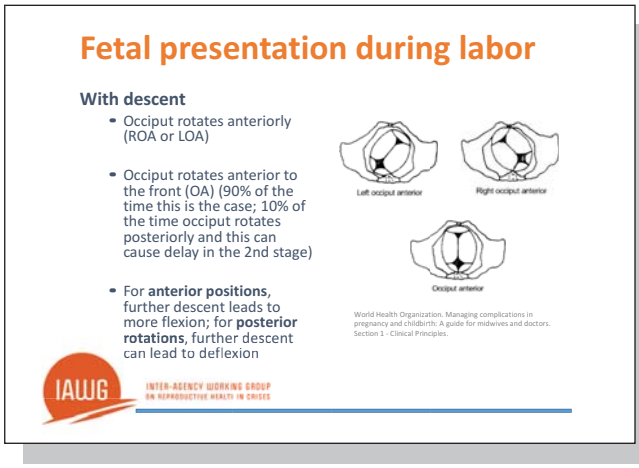
Walk through this image to point out the important anatomical landmarks of the fetal head.

1. The **sagittal suture** goes from the posterior fontanelle to the anterior fontanelle.
2. The **occiput** is at the back of the fetal head and lies between the posterior fontanelle and the neck.
3. The vertex is the part of the top of the fetal head that lies between the **anterior and posterior fontanelles**.

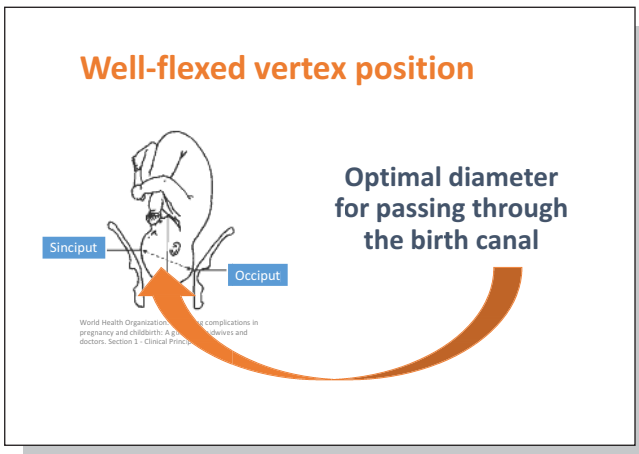


Review normal fetal presentation during labor.

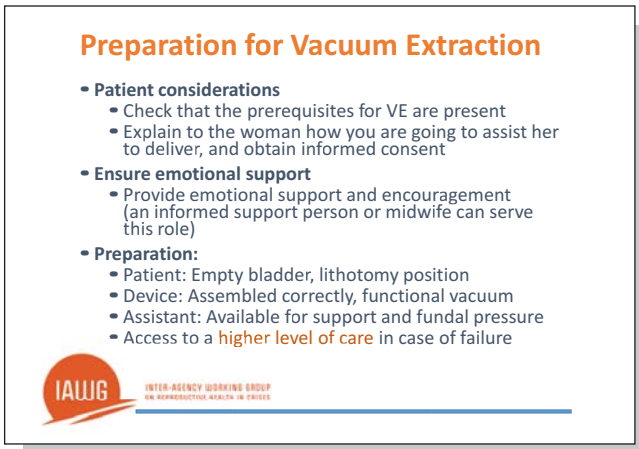
Early in labor: The fetal head enters the pelvic inlet in the occiput transverse position.



With descent: As labor progresses, the head becomes optimally flexed in a vertex position. The fetal head must rotate in order for the longest diameter of the head to pass through the widest diameter of the pelvis. The occiput first rotates to an anterior position toward the maternal left (LOA) or right (ROA). The occiput then rotates to an anterior position for birth (OA). This well-flexed vertex position presents the optimal (smallest) diameter for passing through the pelvis. Problems occur when the occiput rotates posteriorly (10% of the time). In such cases, descent can lead to deflexion, resulting in a larger diameter trying to get through the pelvis. Posterior positions, therefore, often have delay in labor and commonly require assistance from vacuum extraction in the second stage.



The occiput is lower than the sinciput in the pelvis when the fetal head is well-flexed. A fetal head in a well-flexed vertex position has a diameter of 9.5 cm. Abnormal positions and defelxion can prolong the progress of labor due to the larger presenting diameter. **Click the slide a second time for the arrow to appear.**

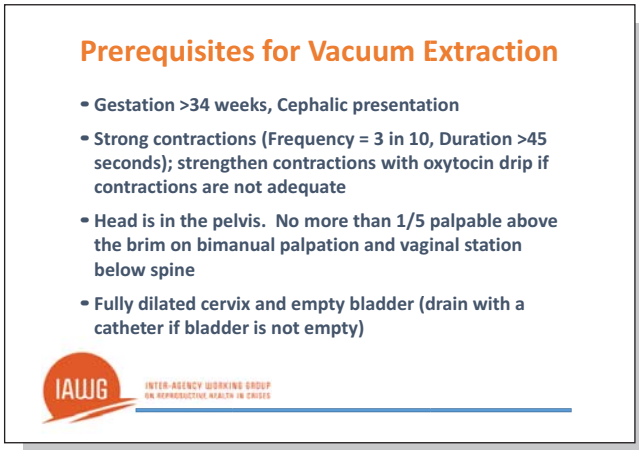


Patient considerations and emotional support were addressed earlier in the training. Ask the participants if they remember the prerequisites for vacuum extraction.

Ensure emotional support: Inform the mother that you are going to help her (when she has a contraction and pushes) by pulling the baby at the same time, but it is really important that she does most of the work. The mother should understand that delivery will occur mainly due to her expulsive efforts, with assistance from traction with the vacuum extractor, and sometimes with some help from fundal pressure.

Preparation:
Patient: After the patient has given consent and vacuum extraction is considered to be an appropriate medical indication, ensure that the patient has an empty bladder and is prepped and in a lithotomy position.

Check your equipment: Make sure the cup, tubes, and pump connections fit together tightly and that the pump works well. Attach the cup to your gloved hand and (ask your assistant to) pump the pressure up to 20 mmHg to test the device.



Look for cephalic presentation, which is not a face or a brow. It is vital that the contractions must be 'strong'; you may damage the fetal scalp by pulling on the vacuum extractor when the contractions are not adequate. You should aim to maximize 'push' factors (contractions, maternal expulsive efforts, fundal pressure) and thereby minimize 'pull' factors (pulling on the vacuum extractor).

It is critical that the head is 'in the pelvis' before you commence a (non-trial) vacuum extraction. Always check the level of the head by bimanual examination to make sure that there is no more than 1/5 of head above the symphysis pubis. For beginners, it is best if there is no head (0/5) above the brim of the pelvis.

Ideally, the cervix should be fully dilated. However, experienced operators can push back an anterior lip of the cervix with contractions before commencing a vacuum extraction. If the bladder is not empty, always catheterize before starting a vacuum extraction.

Procedure

Check if the requirements/prerequisites are present

1. Locate the flexion point by palpating the fontanelle(s) of the fetal head
2. Apply the cup up under the fetal head to the flexion point
3. Create a vacuum; wait 2 minutes for chignon to form
4. Apply traction only during a contraction in conjunction with maternal pushing efforts

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The procedure is divided into five steps: checking if prerequisites are present, locating the the flexion point, applying the vacuum cup to the flexion point, creating a vacuum, and applying traction during a contraction to facilitate delivery.

We will now review the next four steps after checking if the prerequisites are present.

Flexion point

What is it?

- Landmark for placement of the center of the vacuum cup
- Proper placement of the cup on the flexion point promotes flexion, descent, and autorotation of fetal head during traction

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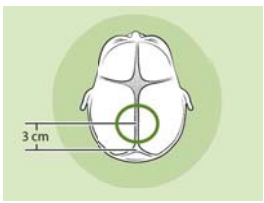
Locate the flexion point: Review that the flexion point is the point that promotes flexion and rotation of the fetal head.

Flexion point

Where is it?

- Over sagittal suture
- 3 cm anterior to the posterior fontanelle
- The anterior border of the cup should be at least 3 cm posterior to the anterior fontanelle



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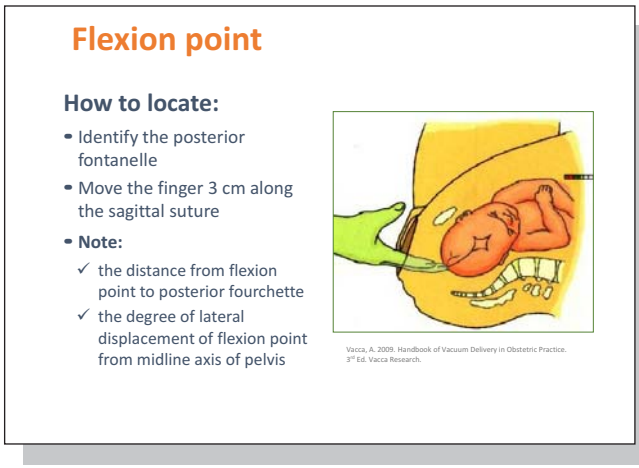
'Over the sagittal suture' means that the cup should be placed on the midline of the fetal head.

The center of the cup 3 cms in front of the posterior fontanelle is difficult to conceptualize and work out through a vaginal examination. Practically, it is easier to push the cup under the fetal head – 5 cms up under the head for anterior positions, and 8-10 cms up under the head for transverse and posterior positions of the occiput.

If the cup is correctly placed, the anterior border of the cup rim will be at least 3 cm behind (i.e. posterior) the anterior fontanelle. This distance can usually easily be palpated – especially when the head has rotated posteriorly.



How do you locate the flexion point during a vaginal exam?

Ask participants to estimate the distance between the tip of their middle finger and (a) the proximal interphalangeal joint and (b) metacarpophalangeal joint (the knuckle).

Demonstrate the distances on your hand:

(1) From the tip of the middle finger to the proximal interphalangeal joint is approximately 5-6 cm.

(2) From the tip of the middle finger to the metacarpophalangeal joint (knuckle) is approximately 10-11 cm.

NOTE: It is very important to determine fetal presentation and accurately locate the flexion point using sterile vaginal examination.

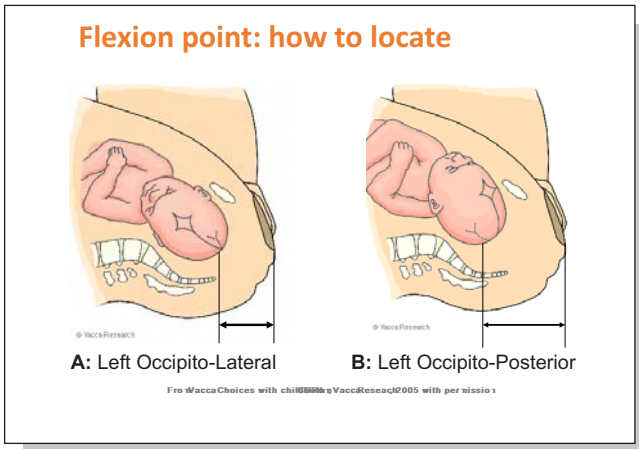
To locate the flexion point, identify the posterior fontanelle with the tip of your middle finger and your palm facing upwards. Then move the finger towards the anterior fontanelle along the sagittal suture for a distance of approximately 3 cm. The tip of the middle finger will now mark the flexion point.

Next, check the distance from the flexion point to the posterior fourchette. With the tip of the examining middle finger on the flexion point, measure the distance from that fingertip to where the finger makes contact with the fourchette.

The distance from the flexion point to the fourchette will help you identify fetal head position. If it is :

- 5-6 cm (from tip to the interphalangeal joint), this indicates OA
- 10-11 cm (from tip to knuckle), this indicates OP
- 8-9 cm is the usual distance to the flexion point in transverse positions of the occiput

This exercise is useful to understand where to apply the vacuum cup. The difficulty level of vacuum extraction depends on the fetal head position. The further back the flexion point is, the more difficult it is to apply the vacuum cup (i.e. with an OP). However, posterior position cup placement is very much facilitated by using non-stemmed cups (i.e. a posterior metal cup or an Omnicup).



Procedure

1. **Locate the flexion point**
2. Apply the cup to the flexion point: push the cup up under the head of the fetus the required distance to reach the flexion point (i.e. 5 cm in for anterior positions, 10 cm for posterior positions)
3. Create a vacuum
4. Apply traction only during a contraction in conjunction with maternal pushing efforts

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Apply the cup

Photo credit: Tomo Watanabe, 2010. Used with permission of Dr. Glen Mola.

1. Wait until there is no contraction

2. Part the labia with one hand and insert the cup with the other

3. Push the cup underneath the fetal head onto the flexion point

Review the necessity for an episiotomy with placement of the cup. This may be the case if the patient was infibulated. If an episiotomy is not necessary for placement, then delay the decision for episiotomy until the head stretches the perineum or until the perineum interferes with the axis of traction.

NOTE: The evidence shows that routine episiotomy is not demonstrated to be an effective way to shorten the second stage of labor. Routine episiotomy has not been proven to be an essential part of an operative vaginal birth because it increases the incidence of maternal trauma.

1. The cup should be applied between contractions.

2. Gently pull the perineum (apply downward pressure on the posterior perineum) with two fingers and insert the cup, rotating it so as to go under the baby's head when you have inserted it inside the introitus.

3. Place the cup underneath the fetal head and push it up posteriorly until you have reached the flexion point, as indicated by the distance you had measured on your finger. Place the center of the cup over the flexion point. The OmniCup tubing has markings at 6 cm and at 11 cm to assist the user in the location of the distance between the flexion point and the fourchette.

   If the cup is placed off to the side of the sagittal suture or closer to the anterior fontanelle, then it promotes asynclitism, deflexion of the head, and disengagement/pop-off of the cup, which can also lead to vacuum extraction failure.

Apply the cup

Photo credit: Tomo Watanabe, 2010. Used with permission of Dr. Glen Mola.

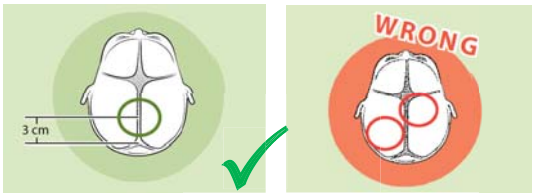
4. **Hold the cup in place with the left hand and pump up the pressure with the right hand**

OR

Direct your assistant to create the vacuum with the pump (Bird)

Hold the cup in place as you (or your assistant, with the Bird vacuum extraction fit) pump the pressure up. This prevents the cup from slipping forward on the fetal scalp before you have fixed it in position with the vacuum pressure.

Apply the cup



The further the cup center is away from the flexion point, the greater the failure rate of vacuum extraction.

The anterior border of the cup must be at least 3 cm back from the anterior fontanelle.

Procedure

1. **Locate the flexion point**
2. **Apply the cup to the flexion point**
3. Create a vacuum and wait 2 minutes for the chignon to form inside the cup
4. Apply traction only during a contraction in conjunction with maternal pushing efforts

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Create a vacuum: Make sure you have checked the vacuum on your hand prior to application to the fetal head.

Create a vacuum

1. First pump the vacuum to 20 kPa and check that no maternal tissue is caught under the edge of the cup
2. If no maternal tissue is caught under the cup, increase the pressure to 80 kPa (green area on the OmniCup scale)
3. Wait 2 minutes for a chignon to form under the cup so that it does not slip forward when you start pulling
4. If the pressure starts to fall, pump it back up so that it is always between 60 and 80 kPa until the procedure is over
5. Wait for the next contraction

Photo credit: Tomo Watanabe, 2010.

Create a vacuum: You have already checked the suction prior to application to the fetal head. Traction is usually applied at between 0.6-0.8 kg/cm^2, 60 – 80 kPA, or 500-600 mmHg.

(Ask your assistant to) Pump up the vacuum to 0.2 kg/cm^2; 20 kPA. Move your finger all around the edge of the cup to check that no maternal tissue is caught.

If you work with an assistant for the vacuum, make it clear you are working as a team. Ask the assistant to maintain pressure and keep it constant until you ask to release it after the birth of the head.

After you have pumped the pressure up to vacuum extraction pressure, wait for 2 minutes (i.e. until the next contraction)

Procedure

1. **Locate the flexion point**
2. **Apply the cup to the flexion point**
3. **Create a vacuum and wait 2 mins for the chignon to form inside the cup**
4. Apply traction only during a contraction in conjunction with maternal pushing efforts

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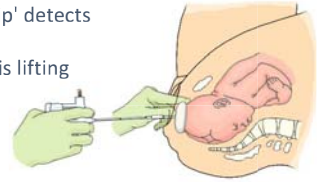
The final step of the procedure is to apply traction during a contraction and in conjunction with maternal pushing efforts. To begin with, the direction of traction must be downwards to the floor. This will promote flexion of the fetal head. Traction is maintained in a downwards direction until the head is starting to bulge out of the introitus, then the direction of pull can be changed to outwards.

Apply traction

The non-pulling hand

- Index finger on scalp and thumb pressing on the cup
- This 'two finger grip' detects progress, and
- Detects if the cup is lifting off of the head



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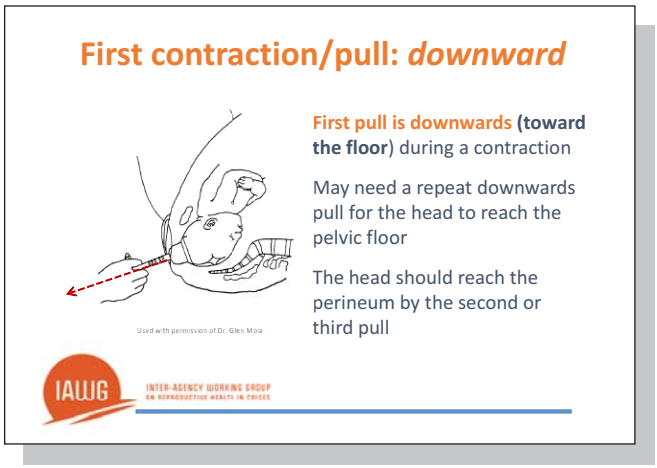
Vacca, A. 2009. Handbook of Vacuum Delivery in Obstetric Practice. 3rd Ed. Vacca Research.

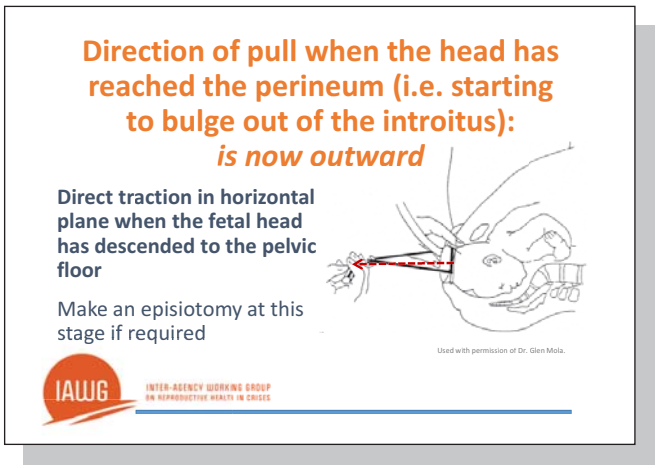
The direction of pull must start downwards to the floor. In the slide above, the direction of pull is outwards, which is only appropriate when the head has started to bulge out of the introitus (i.e. has reached the perineum). Attachment to the scalp is most effective when the direction of the pull is perpendicular to the cup. This is nearly always possible for low extractions but, for mid-pelvic and rotational procedures, oblique traction is necessary to keep the axis of the head in line with the pelvic axis. However, this predisposes to cup detachment, which may cause scalp injuries. To avoid this, traction should be a two-handed exercise. It is important to use the non-pulling hand to counteract this tendency. The index finger of the non-pulling hand rests on the fetal scalp to monitor descent with each pull. The thumb of the same hand presses against the dome of the cup, offering counter-traction and helping to prevent complete detachment from the scalp. Watch the pressure gauge carefully during the procedure; if the pressure drops (due to leakage of the vacuum) you can easily pull the cup off (pop-off).



After the cup is attached to the flexion point and the vacuum is at the correct pressure, wait 2 minutes for the chignon of the scalp to form up into the cup. Traction can then commence with the next contraction.

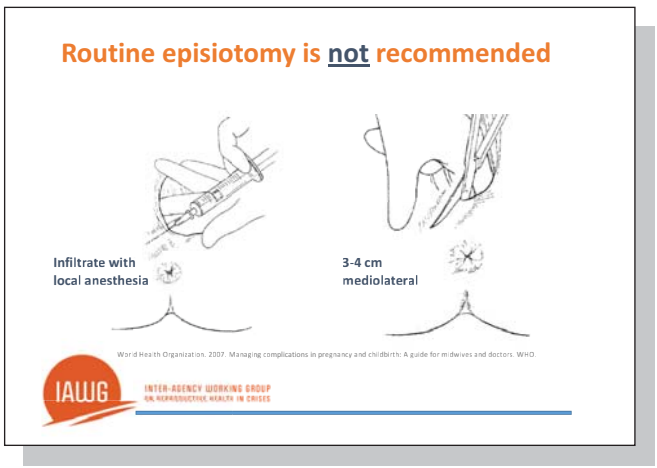
NOTE: The angle of traction should always be in the direction of the pelvic curve.

The first pull is downwards toward the floor to optimally flex the fetal head. You many need to repeat this "first" pull (i.e. a downwards direction pull) a second time to bring the fetal head to the perineum.



Do not start pulling outwards just because the cup has started to deliver. Especially if there is considerable caput, the widest part of the head (biparietal diameter) might still be above the spine.

Outwards pulling direction is only appropriate when the actual fetal head has reached the perineum; the head is starting to bulge out of the introitus.



There is no evidence to support the *routine* use of episiotomy during vacuum delivery. Use a mediolateral episiotomy if one is required.

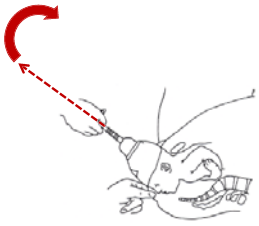
If episiotomy is needed, infiltrate the episiotomy zone with a local anesthetic. Use 10 mL of 0.5% lignocaine and infiltrate the medication deeply into the perineal muscle beneath vaginal mucosa and perineal skin. The local anesthetic starts working within about 1 minute.

When you are using local anesthesia, there is no need to pull back on the plunger to check for aspiration of blood because your needle should be moving almost continuously. One only needs to aspirate when one is performing a nerve block and placing a large bolus of local anesthesia in one place.

Crowning phase of the delivery/pull: *upward*

When the head is crowning, the correct direction of pull is now upwards; however in most cases there is no longer any need to apply traction at this stage

When the head is fully delivered, release the suction pressure



Used with permission of Dr. Glen Mola.

When the head is fully delivered, release the pressure, or direct your assistant to release the pressure (by pulling the tubing off the vacuum bottle or the pump) if using a Bird manual vacuum extractor. Do not unscrew the vacuum bottle release screw, as it might drop on the floor and not be found, thereby making the whole kit useless.

Safety measures (Contractions)

- Never attempt Vacuum Extraction if there are not at least 3 contractions in 10 minutes lasting at least 45 seconds
- Never pull without a contraction
- Always push on the dome of the cup with your thumb (of your non-pulling hand) an place your index finger on the scalp next to the cup during traction to prevent cup detachment and assess slippage
- Delivery of the head should be slow and controlled, as conducted during normal birth, so as to avoid perineal tears and trauma

NOTE: Before undertaking vacuum extraction, consider the risk of failure of the procedure (especially if there is no head palpable above the brim of the pelvis), and be prepared to perform symphysiotomy or refer the patient for cesarean section if the vacuum extraction fails.

You must be very clear about when a vacuum procedure is a "trial" (i.e. it might fail). Always consider the procedure a 'trial' if there is any head palpable above the brim of the pelvis, or there is 3+++ molding, unless the head is down on the perineum when you start.

To be clear about the above, you must be an expert at diagnosis of degrees of molding, head position, and level.

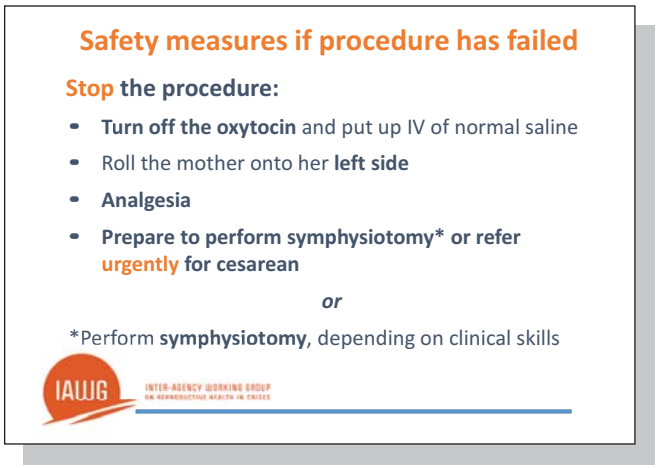
Safety measures

Halt guidelines

Reassess after	One (1) pop-off
	If there is no progress with any pull or you have not been able to deliver the woman with 3-4 pulls
Abandon procedure if	Three (3) pop-offs
	Three (3) pulls over 3 contractions without descent to the perineum
	30 minutes without progress

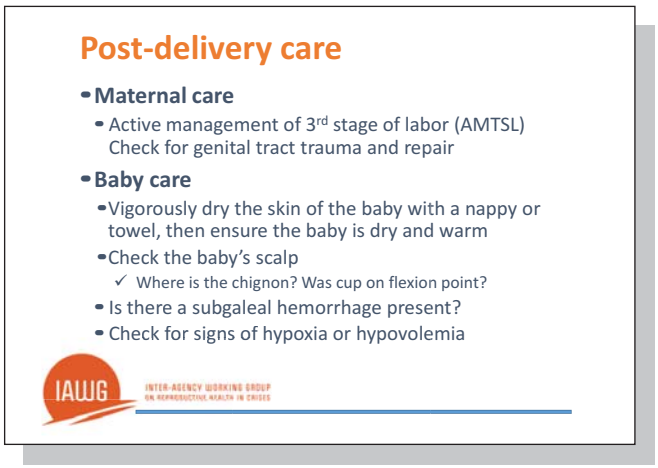
These criteria are the maximal limits for halting vacuum extraction. There may be circumstances where it is appropriate to stop sooner. (i.e. if you are sure that there is no progress with 1-2 pulls.)

Research shows there is greater incidence of scalp trauma with cup application greater than 20 minutes versus less than 20 minutes. If you have a senior colleague you refer to, then you should have a low threshold of consultation if: there are repeated 'pop-offs'; there is no progress with 1-2 pulls; or you have not been able to bring the head down to the perineum by the third pull.



Prepare a plan in case of failure prior to commencing vacuum extraction that includes cesarean section and/or symphysiotomy or cesarean birth, depending on the provider's experience. Symphysiotomy can be performed in the labor room with just 10ms of local anesthetic and a scalpel by those who are trained in the procedure.

For a description of how to perform a symphysiotomy see 'Primary Mothercare and Population' by King and Mola or 'Managing Complications of pregnancy and Childbirth' by WHO.



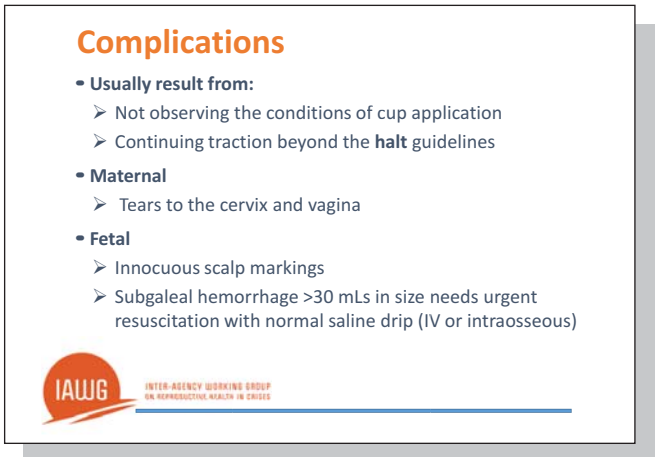
Active management of third stage of labor (AMTSL):

- Give 10 units of oxytocin intramuscularly.
- Apply controlled cord traction to deliver the placenta when the uterus has contracted.
- Massage the uterus after the expulsion of the placenta until the fundus is firm.

Prepare for newborn resuscitation if the baby does not breathe and cry within 60 seconds of birth.

Check for scalp trauma: swelling (check for subgaleal bleeding/hemorrhage) and hypovolemia.

Check for signs of cerebral irritation or birth asphyxia (floppy, pale, not breathing well, poor sucking, listless).



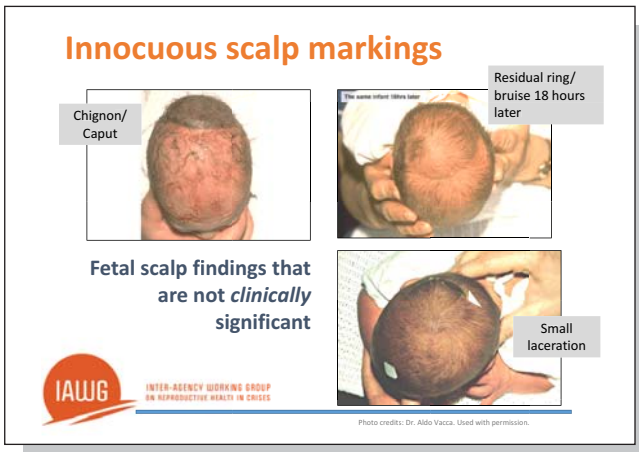
There is the possibility of maternal and fetal complications during vacuum extraction.

NOTE: Complications usually result from not observing the conditions of cup application, continuing to pull when there is no progress, or from continuing traction efforts beyond the halt guidelines previously described.

Maternal complications include tears to the cervix and vagina. It is important that you carefully examine and repair the woman after birth.

Consider the potential for other complications including postpartum hemorrhage and shoulder dystocia. Be prepared to respond.

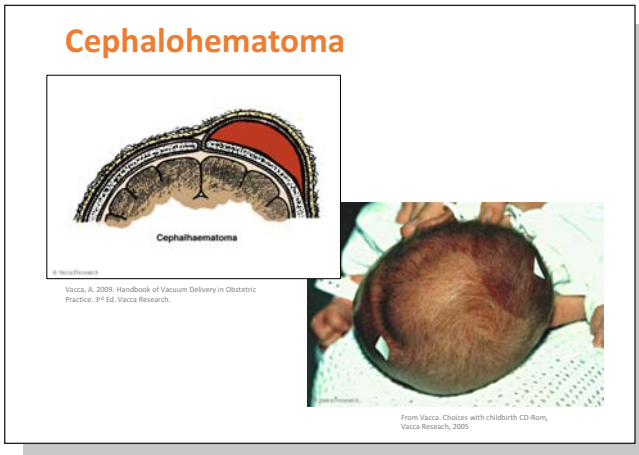
Postpartum hemorrhage (PPH) is very common after assisted delivery for the reason that you are often doing assisted delivery in the presence of a prolonged second stage of labor. Prolonged second stage labor is a very potent risk for PPH.



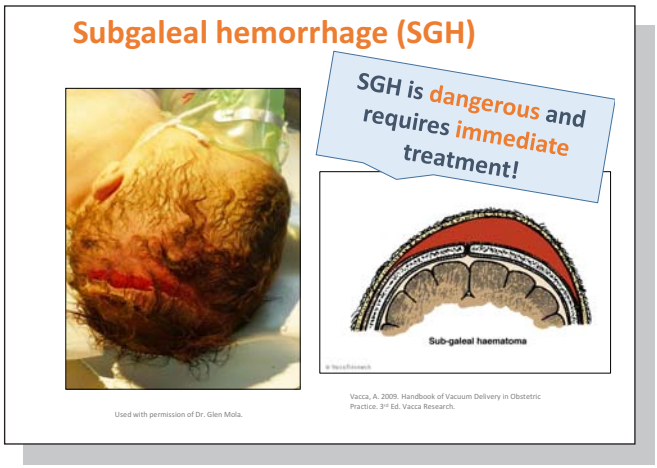
The majority of findings of the fetal scalp after vacuum birth are not clinically significant and will resolve spontaneously.

Caput succedaneum or chignon is localized scalp edema. It occurs when swelling of the scalp and/or a circular mark is present at the site of cup attachment. It is harmless and will disappear spontaneously in a few hours. It is a collection of fluid or blood below the skin of the scalp that can cross suture lines. The second image shows the resolution of the chignon 18 hours later with a r**esidual ring or bruise** from the application of the cup.

Scalp abrasions, lacerations, and blisters are small, superficial injuries that will heal spontaneously in a few days. It is important to thoroughly clean and examine any abrasions or lacerations to determine if sutures are required (usually not).



A **cephalohematoma** is a small collection of blood that accumulates between the deepest layer of the scalp (the periosteum) and the skull. The bleeding is caused by ruptured blood vessels crossing the periosteum. It forms a rubbery, soft, and discreet lump on the baby's head that does not cross suture lines. It is harmless and resolves spontaneously in 3 to 4 weeks. No specific treatment is required. A cephalohematoma may also occur after spontaneous vaginal delivery, and is quite common with forceps delivery.



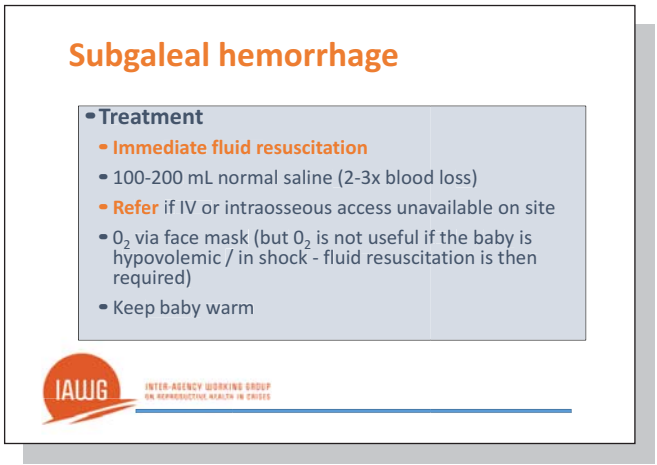
It is important to identify the difference between cephalohematoma and subgaleal hemorrhage, because the latter may be a life-threatening emergency. After discussing the slide, click to show the blue text box regarding SGH.

This is a picture of a baby with an acute subgaleal hemorrhage and a scalp laceration taken in Cambodia by Professor Glen Mola.

Subgaleal hemorrhage (SGH) occurs in approximately 1 to 2% of vacuum births. This type of injury occurs with significant bleeding into the space between the periosteum and the epicranial aponeurosis (scalp) and is an emergency. SGH feels soft, like water in a condom, and will ripple (fluctuate) across the sagittal suture if flicked with a finger.

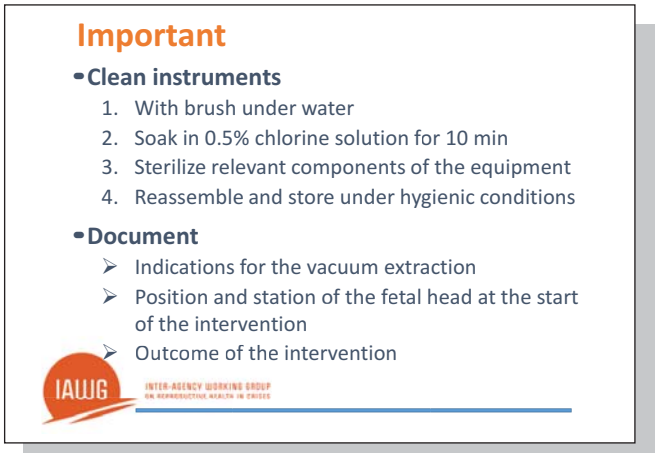
Babies with SGH will have an expanding head circumference and may exhibit signs of hypovolemia, pallor, and tachycardia. A neonate has only 100 mL/kg of circulating blood volume. A baby will develop hemorrhagic shock with a >50 mL SGH. This condition requires emergency resuscitation with normal saline infusion (either IV or intraosseous).

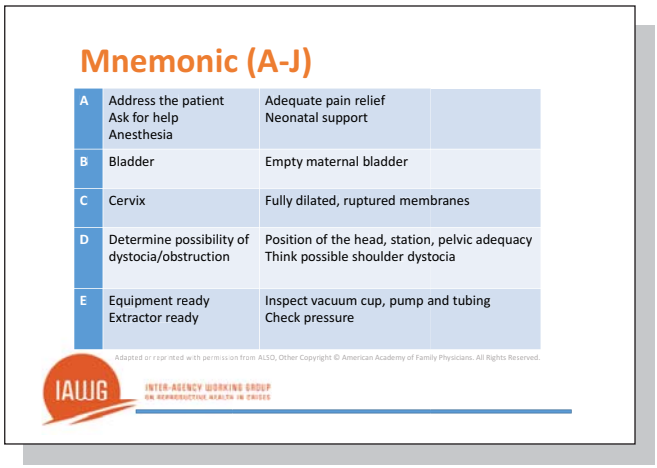
Small subgaleal hemorrhages of less than 30 mLs do not require normal saline resuscitation, but the baby's head should be checked frequently after birth to make sure the hemorrhage is not expanding.



Fluids are preferably infused via intraosseous (bone) wide-bore needle because it is the most rapid. This type of infusion requires a specific kind of needle which may not be available at your place of work. Refer the baby as quickly as possible for fluids if intraosseous or IV access is not available, give the baby oxygen via face mask, and keep the baby warm while planning for a transfer. Recommended fluid resuscitation is 100-200 mL of normal saline, or 2-3x the amount of blood loss to the subgaleal hemorrhage.

See the resources section for a short video on the "tap test" for subgaleal hemorrhage that can be shared with participants.

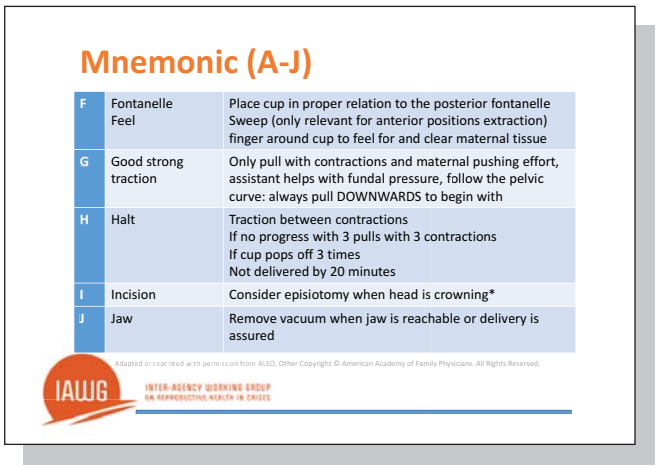


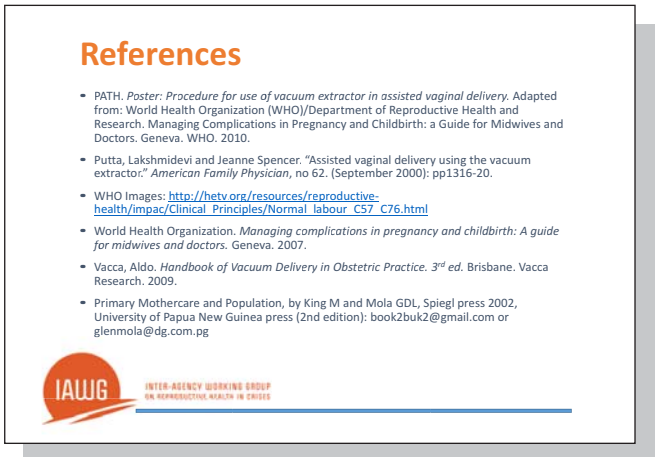


Recap the lecture:
Assessment of the woman and fetus: Monitoring and supportive care
Cup application: Flexion point
When to halt: Avoid unnecessary complications

Assisted vaginal delivery is not an absolute solution for prolonged labor.

On this slide and the next is a useful mnemonic for remembering the safe technique for vacuum extraction to reduce harm to the woman and her fetus. It uses the first 10 letters of the English alphabet, A-J.





Hands-on Activities

Unit 4: Practical Sessions

For the practical sessions, divide participants into two groups (maximum 10 participants per group). Practical Sessions A and B will run concurrently. Group 1 will watch the facilitator demonstrate the appropriate procedure for vacuum extraction in Session A and Group 2 will complete a case study exercise in Session B. Each session will last for 90 minutes. After a short break, ask the groups to switch sessions. At the end of the exercise, reconvene the groups and take 30 minutes to provide feedback on the case study.

Practical Session A: Vacuum Extraction Demonstration

Time

90 minutes

Runs concurrently with Practical Session B.

Objectives

At the end of this session, participants will be able to:

- Understand the vacuum extraction procedure step-by-step using anatomic models.
- Practice assisted vaginal delivery using the Bird vacuum extractor (and OmniCup, if available).

Advance Preparation

Practice with the pelvic models prior to the presentation so that you feel comfortable with the demonstration.

Utilize the *Vacuum Extraction Checklist* to be clear about the steps that must be demonstrated to the participants.

Materials

This session requires the all supplies listed below.

- Two pelvic models (more if possible)
- OmniCups
- Bird manual vacuum extractor
- Water-based lubricant
- Gloves
- Gauze
- Dish soap
- Talcum or baby powder
- Surgical drapes
- *Vacuum Extraction Checklist*, one copy of handout for each participant

Instructions

1. Prepare two identical work stations in one room with pelvic models and all necessary equipment, as listed above. Place ample space between the two demonstration sites.
2. Use talcum or baby powder to facilitate the passage of the fetal model through the birth canal. Practice prior to starting the demonstration.
3. Give a thorough demonstration before letting the participants practice.
4. Emphasize that the participants are expected to practice vacuum extraction as much as possible during the two days, using the *Vacuum Extraction Checklist* as guidance.

Tips for Demonstration:

- State the objective of the demonstration prior to beginning and point out what the participants should do.
- Make sure that everyone can see the steps involved.
- Demonstrate the procedure in as realistic a manner as possible, using instruments and materials in a simulated clinical setting.
- Include all steps of the procedure in the proper sequence according to the approved performance standard in the *Vacuum Extraction Checklist*. This process includes demonstrating non-clinical steps, such as communication with the client and use of recommended infection prevention processes.
- During the demonstration, explain to participants what is being done, especially any difficult or hard-to-observe steps.
- Ask questions of participants to keep them involved.
- Take enough time so that each step can be observed and understood.
- Use equipment and instruments properly, and make sure participants clearly see how they are handled.

Vacuum Extraction Checklist

The following checklist will be used to evaluate the competency of the participants at the end of Day 2 of this training. When demonstrating the procedure, be sure to clearly incorporate all of the steps included below. Copies of this checklist are available on the USB key or IAWG website, and should be given to participants at the time of demonstration to act as a guideline for their practice during the course.

CHECKLIST FOR VACUUM EXTRACTION (Some of the following steps/tasks should be performed simultaneously.)			
STEP/TASK	**CASES**		**REMARKS**
GETTING READY			
1. Prepare the necessary equipment.			
2. Tell the woman what is going to be done, listen to her, and respond attentively to her questions and concerns.			
3. Provide continual emotional support and reassurance, as feasible.			
4. Review to ensure that the following conditions for vacuum extraction are present: ❖ Vertex presentation ❖ Fetus at least 34 weeks gestation ❖ Cervix fully dilated ❖ Head at least at 0 station or no more than 1/5 palpable above the symphysis pubis (for beginners the head should be at 0/5)			
5. Make sure an assistant is available.			
6. Put on apron and other delivery gear, as appropriate.			
PRE-PROCEDURE TASKS			
1. Wash hands thoroughly with soap and water and dry.			
2. Put sterile surgical gloves on both hands.			
3. Clean the vulva with antiseptic solution and place a drape under the woman's buttocks and over her abdomen.			
4. Catheterize the bladder, if necessary.			
5. Check all connections on the vacuum extractor and test the vacuum on a gloved hand.			
VACUUM EXTRACTION			
1. Assess position of fetal head by feeling the sagittal suture line and fontanelles.			
2. Identify the posterior fontanelle.			
3. Apply the appropriate cup to the flexion point on the fetal head: anterior cup 5 cms up under the fetal head for anterior position and posterior cup 8-10 cms up under the fetal head for transverse and posterior positions of the fetal head. (The anterior border of the cup must be at least 3 cms back [posterior to] the anterior fontanelle.)			
4. Have the assistant create a vacuum of 0.2 kg/cm^2 negative pressure with the pump and check the application of the cup (i.e. there is no maternal soft tissue [cervix or vagina] within the rim of the cup). If necessary, release pressure and reapply cup.			

CHECKLIST FOR VACUUM EXTRACTION

(Some of the following steps/tasks should be performed simultaneously.)

STEP/TASK	CASES		REMARKS
5. Increase vacuum to 0.8 kg/cm^2 negative pressure and wait 2 minutes for the fetal scalp chignon to form in the cup (i.e. wait for the next contraction) so that the cup will not slip forward on the fetal head when you commence traction.			
6. With the next contraction, start traction downwards (i.e. towards the floor), use the two-finger grip to monitor cup lift and fetal head descent (thumb pressing on the cup and forefinger in front of the cup on the fetal scalp). Only pull with contractions. ◆ If the fetal head is tilted to one side or not flexed well, downwards traction will correct the tilt or deflexion of the head.			
7. There needs to be progress with each pull. If there is no progress at any time, cease the procedure and consult a senior colleague or refer the mother to a higher level facility. The fetal head should be delivered in 3-4 pulls; the cup should not be applied to the head of the fetus for more than 25 minutes.			
8. Evaluate the need for an episiotomy, and perform if necessary.			
9. When the head has been delivered, release the vacuum, remove the cup, and complete the delivery, including active management of third stage of labor.			
10. Carefully check the birth canal for tears following delivery and repair if necessary.			
11. Repair the episiotomy, if one was performed.			
12. Provide immediate postpartum and newborn care, including bag and mask resuscitation if the baby is not breathing and crying at 1 minute after birth.			
POST-PROCEDURE TASKS, ASSESS THE FETUS, AND CHECK THE FETAL SCALP			
1. Check that there is no evidence of subgaleal hemorrhage (use the finger flick test to ascertain the severity of a subgaleal hemorrhage).			
2. If there is evidence of a significant subgaleal hemorrhage (i.e. >30-40 mLs) the fetus needs immediate IV or intraosseous normal saline resuscitation. A significant subgaleal hemorrhage can cause shock and death if the baby is not resuscitated adequately with normal saline 1:3 blood loss.			
3. Dispose of instruments in 0.5% chlorine solution for 10 minutes and then thoroughly rinse and dry. Remove gloves by turning them inside out and place them in a leakproof container or plastic bag.			
4. Wash hands thoroughly with soap and water and dry.			
5. Record all information on medical record, including estimated blood loss.			

Adapted with permission of Jhpiego. Managing Complications in Pregnancy and Childbirth Learning Resource Package.

Practical Session B: Case Study

Time

90 minutes

Runs concurrently with Practical Session A.

Objectives

At the end of this session, participants will be able to make clinical decisions through:

- assessment
- clinical problem identification
- intervention
- reassessment

Materials

Case Study (available on the USB key or the IAWG website), one copy of handout for each participant

Note to Trainer: It is important that you provide time for an effective summary discussion following a small group activity. This provides closure and ensures that participants understand the point of the activity.

Instructions

Ask the participants to complete the case study in groups of 2 or 3 and hand out the *Case Study* to the groups. Instruct the participants to read through the case study and answer the questions under each section. There is time built into the agenda to bring both groups back together for a joint discussion on the case study after both groups have completed the exercise. The points to emphasize in the session summary are included in the case study notes.

Practical Session B: Case Study

Prepared by Jhpiego for Ministry of Public Health of Afghanistan. (2012). *Community Midwife Education Program Learning Resource Package.* Used with permission.

Mrs. Z is an 18-year-old primigravida. She was brought to the health center in active labor at 10:00 am having felt labor pains since the early hours of the morning; the fetal head was palpable at 4/5 above the symphysis pubis; the cervix was 2 cm dilated and not fully effaced; and contractions were two in 10 minutes, each lasting 25 seconds. Membranes ruptured spontaneously at 2:00 pm, and amniotic fluid was clear. It is now 6:00 pm, and the fetal head is now 3/5 palpable above the symphysis pubis; the cervix is 4 cm dilated; there is minimum caput and molding (+ only); and contractions continue at a rate of two in 10 minutes, lasting now for 40 seconds.

ASSESSMENT (HISTORY, PHYSICAL EXAMINATION, SCREENING PROCEDURES/LABORATORY TESTS)

1. What will you include in your initial assessment of Mrs. Z, and why?
   - Mrs. Z should be told what is going to be done and listened to carefully. In addition, her questions should be answered in a calm and reassuring manner.

2. Based upon the initial presentation at 10:00 am, where is Mrs. Z in the process of labor at 10:00 am. What is the plan of management?
   - Mrs. Z is either in the latent phase of the first stage of labor or she is having an episode of spurious labor.
   - She needs to be checked again in about 8 hours to determine whether she is in true true labor (or earlier if spontaneous rupture of membranes occurs) or there is any concern for the mother or the baby.

3. At 2:00 pm, Mrs. Z is checked again because her membranes have ruptured; what is the reason that she requires another vaginal assessment at this point? What is the plan of management?
   - Another vaginal assessment is required to exclude cord prolapse and determine whether Mrs. Z has progressed in labor.
   - Mrs. Z has now transitioned into the active phase and so far she is normal; the clear liquor indicates that the fetus is well.
   - The plan of management is to continue regular observations of mother (vitals and contractions etc.) and fetus (pad checks and fetal heart auscultation).

4. What is your assessment of the clinical situation now at 6:00 pm? (She has crossed the action line on the partogram.)
   - An assessment should be made to rule out cephalopelvic disproportion (secondary arrest of cervical dilation and descent of presenting part in the presence of good contractions) and obstruction (secondary arrest of cervical dilation and descent of presenting part with large caput, third degree molding, cervix poorly applied to the presenting part, edematous cervix, ballooning of lower uterine segment, formation of retraction band, maternal and fetal distress).

- Mrs. Z's emotional response to labor should also be assessed to determine her level of anxiety and tolerance of pain.
- Her temperature, pulse, respiration rate, and blood pressure should be recorded.
- The fetal heart rate should also be recorded.

5. What particular aspects of Mrs. Z's physical examination will help you make a diagnosis or identify her problems/needs, and why?
   - Abdominal and vaginal examinations should be done to rule out cephalopelvic disproportion, as described above, and effectiveness of contractions should be assessed.

6. When is the next vaginal assessment due?
   - After 4 hours of good contractions: this will be at about 10:00-11:00 pm (i.e. when the oxytocin infusion has been producing good contractions for 4 hours).

DIAGNOSIS (IDENTIFICATION OF PROBLEMS/NEEDS)

You have completed your assessment of Mrs. Z and your main findings include the following:

- Mrs. Z has no symptoms or signs of cephalopelvic disproportion or obstruction.
- Her vital signs are within normal range, as is the fetal heart rate.
- She is not dehydrated.
- She has a high level of anxiety, however, and is finding it difficult to relax between contractions.
- On assessment, the cervix is found to be still 4 cms dilated (at 6:00 pm).

1. Based on these findings, what is Mrs. Z's diagnosis, and why?
   - Mrs. Z's symptoms and signs (i.e. less than three contractions in 10 minutes, each lasting less than 45 seconds) are consistent with **inadequate uterine activity** (uterine inertia).
   - In addition, Mrs. Z has a high level of anxiety, making it difficult for her to relax between contractions.

CARE PROVISION (PLANNING AND INTERVENTION)

The following interventions MUST ONLY be undertaken in a health facility where a cesarean section can be performed. IV oxytocin infusion to induce or augment labour must NEVER be used to augment labor in a basic health center without access to a first referral level facility. If unsatisfactory progress in labor is diagnosed, the woman should be referred to a facility where augmentation of labor and cesarean section, if necessary, can be performed.

1. Based on your diagnosis, what is your plan of care for Mrs. Z, and why?
   - Augmentation of labor should be started, because contractions are inadequate and there is no evidence of cephalopelvic disproportion. An oxytocin infusion should be used for augmentation as follows:
     - An IV infusion of normal saline should be started and oxytocin 2.5 units in 500 mL (or 5iu/l in one liter). Normal saline should be infused at 10 drops/minute.
     - The rate of infusion should be increased by 10 drops/minute every 30 minutes (up to a maximum of 60 drops/minute) until there are three contractions in 10 minutes, each lasting for at least 45 seconds. This

rate should be maintained while there is continuing progress or the birth is completed. However, it is unwise to use oxytocin infusion for the augmentation of labor for more than 8 hours.

- Mrs. Z should not be left alone during augmentation of labor. She should be made as comfortable as possible, and a supportive, encouraging atmosphere, respectful of her wishes, should be provided.
- Ongoing observations should include: maternal pulse, fetal heart rate and contractions half hourly, blood pressure and temperature every 4 hours, urine for protein and acetone every 2–4 hours, vaginal examination every 4 hours (cervical dilation, descent of presenting part, amniotic fluid, and molding), preceded by abdominal examination (descent of presenting part).
- Observations should be recorded on the partogram.

EVALUATION

- At 10:00 pm, Mrs. Z is having three contractions in 10 minutes, each lasting for 50 seconds.
- Her partogram recordings show that her vital signs are normal, the fetal heart rate is within normal range, the cervix is 9 cm dilated, and the fetal head is 1/5 above the symphysis pubis.

1. Based on these findings, what is your continuing plan of care for Mrs. Z, and why?

- Oxytocin infusion and close observation should continue (because so far there has been adequate progress) to ensure that Mrs. Z's labor continues to progress to full dilation of the cervix with continuing descent of the fetal head. The aim should be to avoid crossing the action line on the partogram. Arrangements should be in place for immediate intervention (cesarean section) should this happen. In Mrs. Z's case, this would mean allowing sufficient time for transfer from the health center to the district hospital.
- Mrs. Z should be encouraged to adopt her position of choice during labor and for childbirth when she reaches late (expulsive) second stage.
- When the head is visible, she should be encouraged to follow her own tendency to push. She should be given praise, encouragement, and reassurance regarding her progress.
- If the expulsive phase is prolonged, vacuum extraction should be used to deliver the baby.
- Active management of the third stage should be carried out to reduce postpartum blood loss.
- Immediate postpartum care should be provided for Mrs. Z, including continuing emotional support and reassurance.
- If her newborn requires special care, this should be provided. Otherwise, routine newborn care should be provided, including leaving the newborn in skin-to-skin contact with Mrs. Z and encouraging her to breastfeed her newborn as soon as she feels able to, when the newborn shows interest.

REFERENCES

Managing Complications in Pregnancy and Childbirth: pages S-57; S-64 to S-67

Note: Community midwives should NOT use oxytocin to augment labor unless they are working in a district hospital.

Hands-on Activities

The participants should remain in the same groups for the next set of concurrent practical sessions (maximum 10 participants per group). Practical Sessions C and D will run concurrently. Group 1 will refresh basic neonatal resuscitation skills in Session C and Group 2 will practice vacuum extraction in small groups in Session D. Each session will last for 90 minutes.

Session E refreshes partogram skills and is to be completed in the same 90 minute block as Session C, if it is included in the training.

After a short break, ask the groups to switch sessions so that all participants have completed all hands-on activities.

Practical Session C: Neonatal Resuscitation

Time

90 minutes
Runs concurrently with Practical Session D.
May be combined with Practical Session E (optional).

Objective

At the end of this session, participants will be able to:

- Demonstrate newborn resuscitation using a bag and a mask.

Advance Preparation

Ensure that the neonatal simulators are prepared and that the bags and masks are set up for use prior to this session.

Materials

- Newborn simulator(s) x 2
- Bag and mask
- Mucus extractor or other type of neonatal suction apparatus
- Fabric or towel to dry and wrap the baby
- Cord clamps and delivery kit to simulate clamping and cutting the cord
- *Newborn Resuscitation Checklist*, one copy of handout for each participant
- Algorithm for neonatal resuscitation
- Optional: Partogram video (available on the IAWG website and USB key)

Instructions

1. Prepare two identical work stations in one room with the newborn simulators and all necessary equipment as listed above. Place ample space between the two demonstration sites.
2. If you opt to do Session E, then start by playing the 16-minute partogram video. Review the partogram form with the group before beginning the exercises. Participants can complete the exercises in groups of 2-3 while their peers utilize the newborn simulators.
3. The trainer supervises the session and provides feedback to the group.

4. Participants should go through the *Neonatal Resuscitation Checklist* using the simulators in groups of 2 or 3.
5. Instruct the participants that each individual should perform the entire process of newborn resuscitation with the simulator at least once during the practical session. Individuals in each group of 2-3 should take turns using the checklist to check the skills of each participant as he or she completes the simulation.

Note to Trainer: The participants should be instructed to simulate the steps immediately following birth utilizing the printed algorithm provided. After they complete the simulation, then they should take turns monitoring each other walking through the steps of neonatal resuscitation using the checklists provided. This session is meant as a refresher course for existing skills.

Practical Session C:
Newborn Resuscitation

Prepared by Jhpiego for the Ministry of Health in the Republic of the Union of Myanmar. (2012). *Improved Midwifery for Maternal, Newborn, and Child Health Services: Best Practices in Maternal and Newborn Care Facilitator's Manual.* Used with permission.

CHECKLIST FOR NEWBORN RESUSCITATION **(Many of the following steps/tasks should be performed simultaneously.)**				
STEP/TASK	**REMARKS**			
GETTING READY (Prepare for a birth)				
1. Ensure that the area for newborn resuscitation is prepared and that a mucus extractor, self-inflating bag, correct-sized masks for ventilation, and pediatric stethoscope are clean and ready for use for every delivery. Provider should have washed hands and put on sterile gloves.				
2. Tell the woman (and her support person) what is going to be done and encourage them to ask questions.				
3. Provide continual emotional support and reassurance, as feasible.				
SKILL/ACTIVITY PERFORMED SATISFACTORILY?	**Initials**		**Date**	
IMMEDIATE NEWBORN CARE				
1. When baby is born, place immediately on mother's abdomen and dry the baby quickly and thoroughly with a warm, dry cloth.				
2. Assess the baby's crying and breathing efforts during the first 60 seconds after birth. If crying/breathing normally, continue with the next step. If not crying or breathing normally by 60 seconds after delivery, go to "Initial Resuscitation Step #1".				
3. Remove wet cloth and place baby skin-to-skin on mother's chest, covering with a warm, dry cloth. Cover head with cap or cloth.				
4. Clamp and cut cord within 2-3 minutes or after pulsations have ceased.				
5. Continue to observe baby's breathing/crying as you proceed with the other steps of the delivery.				
SKILL/ACTIVITY PERFORMED SATISFACTORILY?	**Initials**		**Date**	
INITIAL RESUSCITATION STEPS (if the baby does not cry or breathe normally)				
1. Dry the baby quickly and thoroughly. Remove the wet cloth.				
2. Clear the airway; position head and suction mouth and nose only if secretions are seen. (Do not suction mouth and nose routinely.)				
3. Stimulate breathing by rubbing the back 2-3 times.				
4. If the baby cries or breathes normally, place baby skin-to-skin on mother's chest, covering with a warm, dry cloth. Cover head with cap or cloth.				
5. If the baby does not breathe after rubbing the back, clamp and cut the cord, place the baby on a clean, dry surface in the resuscitation area, and cover with a hat and dry cloth, leaving the chest exposed.				

CHECKLIST FOR NEWBORN RESUSCITATION **(Many of the following steps/tasks should be performed simultaneously.)**				
STEP/TASK	**REMARKS**			
6. Proceed with ventilation using bag and mask within one minute after birth.				
SKILL/ACTIVITY PERFORMED SATISFACTORILY?	**Initials**		**Date**	
RESUSCITATION USING BAG AND MASK				
1. Position the baby's head in a slightly extended position to open the airway.				
2. Place the mask on the baby's face so that it covers the chin, mouth, and nose. Form a seal between the mask and face and begin ventilation.				
3. Ensure that the chest is rising with each ventilation. Ventilate at a rate of 40 breaths/minute for 1 minute.				
4. If the baby is still not breathing, call for help and improve ventilation. ❖ Head – reposition, reapply mask ❖ Mouth – clear secretions, open mouth slightly ❖ Bag – squeeze harder & continue ventilation				
5. If not breathing well, palpate the umbilical cord or listen to the heart rate with a stethoscope. ❖ If heart rate is more than 100, continue ventilation. If the baby is breathing spontaneously and there is no indrawing of the chest and no grunting, put the baby in skin-to-skin contact with the mother. ❖ Monitor with mother.				
6. If breathing is less than 30 breaths per minute, heart rate is less than 100 beats per minute or severe chest indrawing is present, continue ventilating (with oxygen if available) and arrange for immediate referral for advanced care.				
7. If the baby does not breathe spontaneously and has no detectable heart rate after 10 minutes of ventilation, resuscitation should be stopped.				
8. If the baby has a heart rate below 60 beats per minute and no spontaneous breathing after 20 minutes of ventilation, resuscitation should be stopped.				
SKILL/ACTIVITY PERFORMED SATISFACTORILY?	**Initials**		**Date**	
POST-PROCEDURE TASKS				
1. Place disposable suction catheters and mucus extractors in a leak-proof container or plastic bag. Place reusable catheters and mucus extractors in 0.5% chlorine solution for decontamination. Then, clean and process.				
2. Clean and decontaminate the valve and mask and check for damage.				
3. Wash hands thoroughly.				
4. Ensure that the mother is aware of the outcome of the resuscitation and provide support as necessary.				
5. Record pertinent information on the mother's/newborn's record.				
SKILL/ACTIVITY PERFORMED SATISFACTORILY?	**Initials**		**Date**	

Practical Session D: Practice Performing Vacuum Extraction

Time

90 minutes

Runs concurrently with Practical Session C (&E).

Objectives

At the end of this session, participants will be able to:

- Demonstrate the preparation of the patient for vacuum extraction, including information and communication.
- Demonstrate post-procedural care following vacuum extraction.
- Practice all of the steps in vacuum extraction with peer support.

Materials

This session requires all the supplies listed below.

- Two pelvic models (more if possible)
- OmniCups
- Bird manual vacuum extractor
- Gloves
- Gauze
- Dish soap
- Talcum or baby powder
- Surgical drapes
- *Vacuum Extraction Checklist*, one copy of handout for each participant

Instructions

1. Instruct participants to form groups of three people, maximum four people.
2. Within the group, assign the roles of provider performing vacuum extraction, assistant, patient, and observer.
   - The provider explains the procedure, obtains consent, prepares the woman, and performs the procedure.
   - The assistant is available to the provider during the course of the procedure.
   - The patient is responsible for role-playing the woman in labor and delivering the fetus through the simulator. Facilitators should be available to assist with using the models as required.
   - The observer uses the checklist to track the participant in the provider role and provide feedback.
3. Participants take turns monitoring each other as they walk through the steps of vacuum extraction using the checklist provided. This session is meant as a refresher for existing skills. Explain that participants will be evaluated on their competence in performing vacuum extraction on the model in front of a facilitator on the afternoon of Day 2.

Note to Trainer:

- Prepare the work stations the evening before Day 2, if possible. The stations should be set up from Practical Session A, but the modules may require cleaning or re-set after the work on Day 1, as the participants are given time to practice.
- Prepare two identical work stations in one room with anatomic models and all necessary equipment, as listed above. Place ample space between the two demonstration sites.
- Use lubricant to facilitate the passage of the fetal model through the birth canal. Practice prior to starting the demonstration.
- Demonstrate the procedure again before letting the participants practice, if needed.
- Emphasize that the participants are expected to practice vacuum extraction as much as possible.

Vacuum Extraction

Place a "✔" in the case box if step/task is performed satisfactorily, an "✘" if it is not performed satisfactorily, or **N/O** if not observed.

Satisfactory: Performs the step or task according to the standard procedure or guidelines.

Unsatisfactory: Unable to perform the step or task according to the standard procedure or guidelines.

Not Observed: Step or task not performed by participant during evaluation by trainer.

Participant:_____ **Date Observed:**_____

CHECKLIST FOR VACUUM EXTRACTION (Some of the following steps/tasks should be performed simultaneously.)			
STEP/TASK	**CASES**		**REMARKS**
GETTING READY			
1. Prepare the necessary equipment.			
2. Tell the woman what is going to be done, listen to her, and respond attentively to her questions and concerns.			
3. Provide continual emotional support and reassurance, as feasible.			
4. Review to ensure that the following conditions for vacuum extraction are present: ❖ Vertex presentation ❖ Fetus at least 34 weeks gestation ❖ Cervix fully dilated ❖ Head at least at 0 station or no more than 1/5 palpable above the symphysis pubis (for beginners the head should be at 0/5)			
5. Make sure an assistant is available.			
6. Put on an apron and other delivery gear as appropriate.			
PRE-PROCEDURE TASKS			
1. Wash hands thoroughly with soap and water and dry.			
2. Put sterile surgical gloves on both hands.			
3. Clean the vulva with antiseptic solution and place a drape under the woman's buttocks and over her abdomen.			
4. Catheterize the bladder, if necessary.			
5. Check all connections on the vacuum extractor and test the vacuum on a gloved hand.			

CHECKLIST FOR VACUUM EXTRACTION (Some of the following steps/tasks should be performed simultaneously.)			
STEP/TASK	**CASES**		**REMARKS**
VACUUM EXTRACTION			
1. Assess position of the fetal head by feeling the sagittal suture line and fontanelles (both anterior and posterior fontanelle if possible).			
2. Apply the appropriate cup to the flexion point on the fetal head: anterior cup 5 cms up under the fetal head for anterior position, and posterior cup 8-10 cms up under the fetal head for transverse and posterior positions of the fetal head. (The anterior border of the cup must be at least 3 cms back [posterior to] the anterior fontanelle.)			
3. Have the assistant create a vacuum of 0.2 kg/cm^2 negative pressure with the pump and check the application of the cup (i.e. there is no maternal soft tissue [cervix or vagina] within the rim of the cup). ❖ If necessary, release pressure and reapply the cup.			
4. Increase vacuum to 0.8 kg/cm^2 negative pressure and wait 2 minutes for the fetal scalp chignon to form in the cup (ie. wait for the next contraction) so that the cup will not slip forward on the fetal head when you commence traction.			
5. With the next contraction, start traction downwards (i.e. towards the floor). Use the two finger grip to monitor cup lift and fetal head descent (thumb pressing on the cup and forefinger in front of the cup on the fetal scalp). Only pull with contractions. ❖ If the fetal head is tilted to one side or not flexed well, downwards traction will correct the tilt or deflexion of the head.			
6. There needs to be progress with each pull. If there is no progress at any time, cease the procedure and consult a senior colleague or refer the mother to a higher level facility. The fetal head should be delivered in 3-4 pulls; the cup should not be applied to the head of the fetus for more than 25 minutes.			
7. Evaluate the need for an episiotomy, and perform if necessary.			
8. When the head has been delivered, release the vacuum, remove the cup, and complete the delivery, including active management of third stage of labor.			
9. Carefully check the birth canal for tears following delivery and repair, if necessary.			
10. Repair the episiotomy, if one was performed.			
11. Provide immediate postpartum and newborn care, including bag and mask resuscitation if the baby is not breathing and crying 1 minute after birth.			

CHECKLIST FOR VACUUM EXTRACTION (Some of the following steps/tasks should be performed simultaneously.)			
STEP/TASK	**CASES**		**REMARKS**
POST-PROCEDURE TASKS (Assess the fetus and check the fetal scalp)			
1. Check that there is no evidence of subgaleal hemorrhage (use the finger flick test to ascertain the severity of a subgaleal hemorrhage).			
2. If there is evidence of a significant subgaleal hemorrhage (i.e. >30-40 mLs), the fetus needs immediate IV or intraosseous normal saline resuscitation. A significant subgaleal hemorrhage can cause shock and death if the baby is not resuscitated adequately with normal saline 1:3 blood loss.			
3. Dispose of instruments in 0.5% chlorine solution for 10 minutes and then thoroughly rinse and dry. Remove gloves by turning them inside out and place them in a leakproof container or plastic bag.			
4. Wash hands thoroughly with soap and water and dry.			
5. Record all information on the woman's record, including estimated blood loss.			

Practical Session E: Partogram
(Optional)

Time
90 minutes
Can be combined with Practical Session C.
If included, then will run concurrently with Practical Session D.

Objectives
At the end of this session, participants will be able to:
- Use the partogram to chart labor progress.

Materials
The handouts and video listed below are available on the USB key or the IAWG website.
- *Partogram*, three copies of a blank handout per participant
- *Partogram - answers*, one copy of handout per participant
- Video

Instructions
This session is optional. It is recommended that the cases are given to the participants during Practical Session C so they can work on them when they are not participating in the newborn simulation. Make time to debrief on this activity if it is included. Instruct the participants to complete the partogram in groups of 2 or 3. Each case study provides instructions for charting information on the partogram and making clinical decisions based on the information provided. The answer key contains pictures of completed partograms and corresponding case study notes for discussion. Participants should receive the answer key after the activity is complete.

Note to Trainer: If you opt to do this session, review the partogram form with the group before beginning the exercise. If needed, play the 16-minute partogram video.

Practical Session E: Answer Key

Adapted from Jhpiego. *Managing Complications in Pregnancy and Childbirth Learning Resource Package.*

CASE 1

Instructions: The group members should systematically go through each step below and plot the information on their individual partograms. Answer the questions associated with each step for Mrs. A.

STEP 1: Mrs. A was admitted at 05.00 on 19 September 2015. Membranes ruptured at 04.00. She is a gravida 3, para 2+0. The hospital number is 7886. On admission, the fetal head was 4/5 palpable above the symphysis pubis and the cervix was 2 cm dilated. Contractions are 2 in 10, lasting for 25 seconds.

Q: What should be recorded on the partogram?

Note: Mrs. A is not in the active phase of labor. Record the details of her history , contractions, and your examination findings. If you are using a partogram that allows for observations of the latent phase of labor, record your findings on the partogram. If not, record your findings in the mother's case notes. She is due for another vaginal examination in 8 hours or earlier if spontaneous rupture of the membrane occurs.

SEE PARTOGRAM

STEP 2: It is 13.00 (8 hours later). The fetal head is 3/5 palpable above the symphysis pubis. The cervix is 5 cm dilated.

Q: What should you now record on the partogram?

SEE PARTOGRAM

STEP 3: Mrs. A is now in the active phase of labor. Note the phase of labor and plot the following information on the partogram:

- 3 contractions in 10 minutes, each lasting 40 seconds
- Fetal heart rate (FHR) 120
- Membranes ruptured: amniotic fluid remains clear on pad check
- Sutures of the skull bones are apposed (molding +), no caput
- Blood pressure 120/70 mmHg
- Temperature 36.8°C
- Pulse 80/minute
- Urine output 200 mL; negative protein and acetone

Answer the following questions:

Q: What steps should be taken?

- Inform Mrs. A and her family of findings and what to expect.
- Encourage Mrs. A to ask questions.
- Provide comfort measures and hydration.

Q: What advice should be given?

- Assume the position of her choice.
- Drink plenty of fluids.
- Eat as desired.

Q: What do you expect to find at 17:00?

- Progress to at least 9 cm dilatation.

STEP 4: Labor monitoring is ongoing over the next four hours. Plot the following information on the partogram:

09.30 FHR 120, Contractions 2/10 each 30 seconds, Pulse 80/minute
10.00 FHR 136, Contractions 2/10 each 30 seconds, Pulse 80/minute
10.30 FHR 140, Contractions 2/10 each 35 seconds, Pulse 88/minute
11.00 FHR 130, Contractions 2/10 each 40 seconds, Pulse 88/minute, Temperature 37°C
11.30 FHR 136, Contractions 3/10 each 40 seconds, Pulse 84/minute, Head is 2/5 palpable
12.00 FHR 140, Contractions 3/10 each 40 seconds, Pulse 88/minute
12.30 FHR 130, Contractions 3/10 each 45 seconds, Pulse 88/minute
13.00 FHR 140, Contractions 3/10 each 45 seconds, Pulse 90/minute, Temperature 37°C

- 13.00:
  - The fetal head is 2/5 palpable above the symphysis pubis
  - The cervix is fully 5 cm dilated
  - Amniotic fluid is clear
  - Sutures apposed
  - Blood pressure 100/70 mmHg
  - Urine output 150 mL; negative protein and acetone

Answer the following questions:

Q: What steps should be taken?

- Assume the position of her choice.
- Frequent sips of fluids.

Vaginal assessment at 17.00 shows that the cervix is now fully dilated and the head has descended to 0/5; Mrs. A now feels expulsive. Record the following information on the partogram.

Q: What advice should be given? Push only with the urge to push.

Q: What do you expect to happen next? Spontaneous vaginal birth.

STEP 5: Record the following information on the partogram:

- 7.20: Spontaneous birth of a live female infant weighing 2,850 g

Answer the following questions:

Q: How long was the active phase of the first stage of labor?

5 hours (4 hours from 13.00 - 17.00).

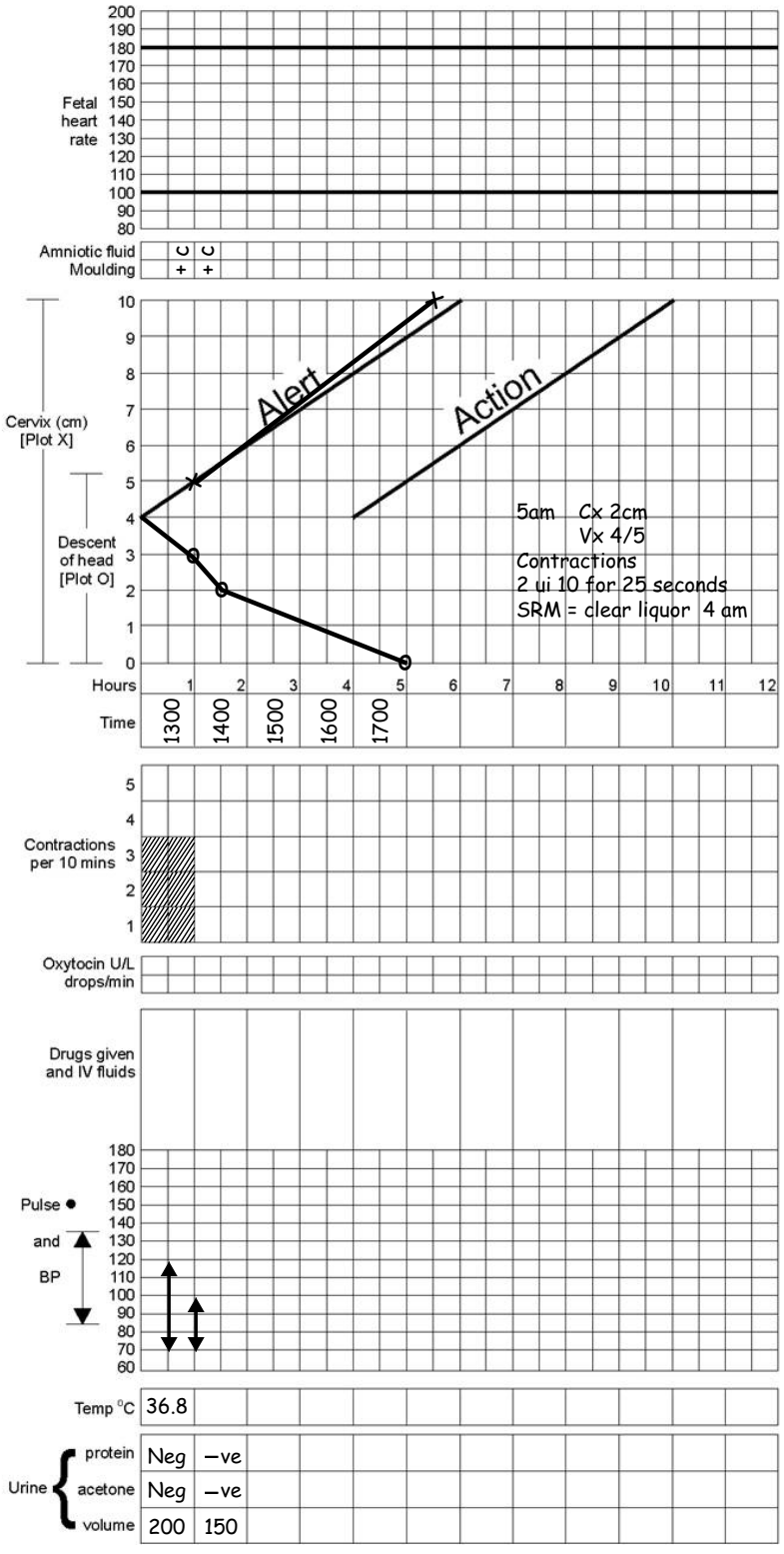
Q: How long was the second stage of labor?

20 minutes.

CASE 1

Name Mrs. A Gravida 3 Para 2 +0 Hospital number 7886 (464521)

Date of admission 19.9.15 Time of admission 5 am Ruptured membranes 1 hours



CASE 2

Instructions: The group should systematically go through each step below and plot the information on each participant's individual partogram. Answer the questions associated with each step for Mrs. B.

STEP 1: Mrs. B was admitted at 10.00 on 19 September 2013. She is gravida 1, para 0+0. Her membranes are intact. The hospital number is 1443.

Record the personal history details above on the partogram, together with the following details:

- The fetal head is 3/5 palpable above the symphysis pubis
- The cervix is 4 cm dilated
- 2 contractions in 10 minutes, each lasting for 30 seconds
- FHR 140
- Membranes intact
- Blood pressure 100/70 mmHg
- Temperature 36.2°C
- Pulse 80/minute

Answer the following questions:

Q: What is your diagnosis? Active labor

Q: What action will you take?

- Inform Mrs. B and her family of the findings and what to expect.
- Always provide the opportunity for Mrs. B to ask questions.
- Encourage Mrs. B to walk around, eat, and drink as desired.

STEP 2: Plot the following information on the partogram for Mrs. B:

10.30 FHR 140, Contractions 2/10 each 25 seconds, Pulse 90/minute
11.00 FHR 136, Contractions 2/10 each 15 seconds, Pulse 88/minute
11.30 FHR 140, Contractions 2/10 each 30 seconds, Pulse 84/minute
12.00 FHR 136, Contractions 2/10 each 30 seconds, Pulse 88/minute, Temperature 36.2°C, Membranes intact. The fetal head is 5/5 palpable above the symphysis pubis. The cervix is 4 cm dilated.

Answer the following questions:

Q: What is your diagnosis?

- Prolonged active phase of labor.
- Less than 3 contractions in 10 minutes, each lasting less than 40 seconds.
- Good fetal and maternal condition.

Q: What action will you take?

Note: Plan to facilitate a discussion about using oxytocin to augment labor based on the clinical setting. For instance, is the woman being cared for at a health post that is 4 hours away from a district hospital where an oxytocin drip can be started? Or if she is in a district hospital, can other measures be used before oxytocin is started, such as hydration and ambulation?

STEP 3: Plot the following information on the partogram:

12.30 FHR 136, Contractions 2/10 each 30 seconds, Pulse 90/minute
13.00 FHR 140, Contractions 2/10 each 30 seconds, Pulse 88/minute

13.30 FHR 130, Contractions 2/10 each 30 seconds, Pulse 88/minute

14.00 FHR 140, Contractions 2/10 each 30 seconds, Pulse 90/minute, Temperature 36.8°C, Blood pressure 100/70 mmHg. The fetal head is 3/5 palpable above the symphysis pubis. Urine output 300 mL; negative protein and acetone.

Answer the following questions:

Q: What is your diagnosis?

- Prolonged active phase.
- Less than 3 contractions per 10 minutes, each lasting less than 30 seconds.
- Good fetal and maternal condition.

Q: What will you do?

- Augment labor with oxytocin and artificial rupture of membranes.
- Inform Mrs. B and her family of the findings and what to expect.
- Reassure.
- Answer questions.
- Encourage drinks.
- Encourage Mrs. B to assume the position of her choice.

STEP 4: Plot the following information on the partogram:

- 14:00:
  - The cervix is 4 cm dilated, sutures apposed
  - Labor augmented with oxytocin 2.5 units in 500 mL IV fluid at 10 drops per minute (dpm)
  - Membranes artificially ruptured, clear fluid
- 14.30:
  - 2 contractions in 10 minutes, each lasting 35 seconds
  - Infusion rate increased to 20 dpm
  - FHR 140, Pulse 90/minute
- 15.00:
  - 3 contractions in 10 minutes, each lasting 40 seconds
  - Infusion rate increased to 30 dpm
  - FHR 140, Pulse 90/minute
- 15:30:
  - 3 contractions in 10 minutes, each lasting 45 seconds
  - Infusion rate increased to 40 dpm
  - FHR 140, Pulse 88/minute
- 16.00:
  - Fetal head now 2/5 palpable above the symphysis pubis
  - Cervix 6 cm dilated; sutures apposed
  - 3 contractions in 10 minutes, each lasting 45 seconds
  - Infusion rate maintained at 40 dpm
  - FHR 144, Pulse 92/minute
  - Amniotic fluid clear

- 16.30:
  - 3 contractions in 10 minutes, each lasting 45 seconds
  - FHR 140, Pulse 90/minute
  - Infusion increase to 50 dpm

Q: What steps would you take?

- Continue to augment labor (maintain oxytocin infusion rate at 50 dpm).
- Provide comfort (psychological and physical).
- Encourage drinks and nutrition.

STEP 5: Plot the following information on the partogram:

- 17.00 FHR 138, Pulse 92/minute, Contractions 3/10 each 45 seconds, Maintain at 50 dpm
- 17.30 FHR 140, Pulse 94/minute, Contractions 3/10 each 45 seconds, Maintain at 50 dpm
- 18.00 FHR 140, Pulse 96/minute, Contractions 4/10 each 50 seconds, Maintain at 50 dpm
- 18.30 FHR 144, Pulse 94/minute, Contractions 4/10 each 50 seconds, Maintain at 50 dpm

STEP 6: Plot the following information on the partogram:

- 19.00:
  - Fetal head 0/5 palpable above the symphysis pubis
  - 4 contractions in 10 minutes, each lasting 50 seconds
  - FHR 144, Pulse 90/minute
  - Cervix fully dilated. Mother feels expulsive.

STEP 7: Record the following information on the partogram:

- 19.30:
  - 4 contractions in 10 minutes, each lasting 50 seconds
  - FHR 142, Pulse 100/minute

- 20.00:
  - 4 contractions in 10 minutes, each lasting 50 seconds
  - FHR 146, Pulse 110/minute
  - Spontaneous birth of a live male infant weighing 2,654 g

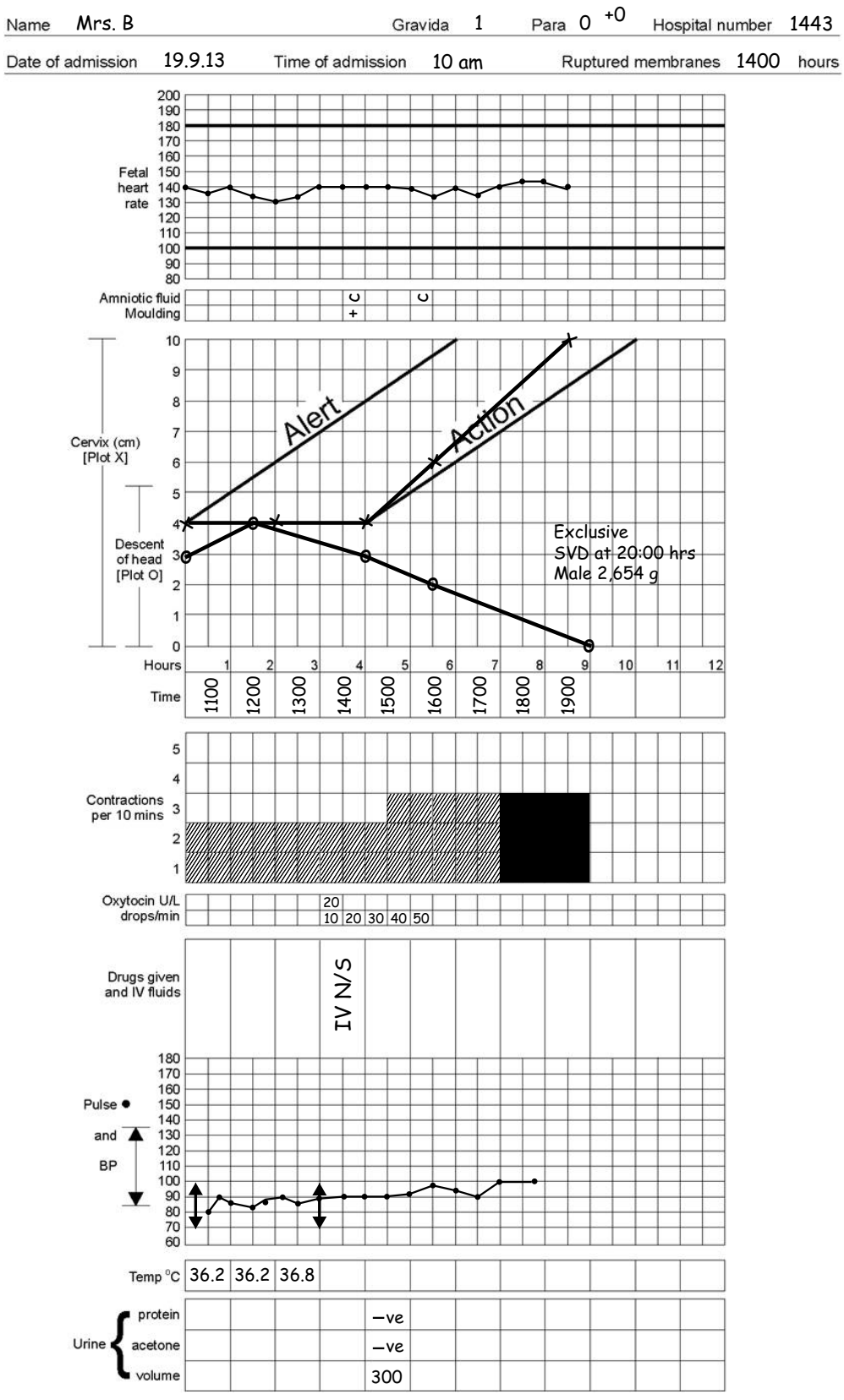
Answer the following questions:

Q: How long was the active phase of the first stage of labor? Nine hours.

Q: How long was the second stage of labor? One hour (60 minutes).

Q: Why was labor augmented? Less than 3 contractions in 10 minutes, each lasting less than 40 seconds (lack of progress).

CASE 2


Name Mrs. B
Gravida 1
Para 0 +0
Hospital number 1443
Date of admission 19.9.13
Time of admission 10 am
Ruptured membranes 1400 hours
Fetal heart rate
Amniotic fluid
Moulding
+ C
C
Cervix (cm) [Plot X]
Descent of head [Plot O]
Alert
Action
Exclusive
SVD at 20:00 hrs
Male 2,654 g
Hours
Time
1100
1200
1300
1400
1500
1600
1700
1800
1900
Contractions per 10 mins
Oxytocin U/L drops/min
Drugs given and IV fluids
IV N/S
Pulse
and
BP
Temp °C
36.2
36.2
36.8
Urine
protein
acetone
volume
–ve
–ve
300

CASE 3

STEP 1: Mrs. C was admitted at 10.00 on 19 September 2013. Membranes ruptured spontaneously at 04.00. She is a gravida 4, para 3+0. Her hospital number is 6639.

Record the information above on the partogram, together with the following details:

- Fetal head 3/5 palpable above the symphysis pubis
- Cervix 4 cm dilated
- 3 contractions in 10 minutes, each lasting 30 seconds
- FHR 140
- Amniotic fluid clear
- Sutures apposed (Molding +)
- Blood pressure 120/70 mmHg
- Temperature 36.8°C
- Pulse 80/minute

STEP 2: Plot the following information in the partogram:

- 10.30 FHR 130, Contractions 3/10 each 45 seconds, Pulse 80/minute
- 11.00 FHR 136, Contractions 3/10 each 45 seconds, Pulse 90/minute
- 11.30 FHR 140, Contractions 3/10 each 45 seconds, Pulse 88/minute
- 12.00 FHR 140, Contractions 3/10 each 45 seconds, Pulse 90/minute, Temperature 37°C, Head 3/5 palpable
- 12.30 FHR 130, Contractions 3/10 each 45 seconds, Pulse 90/minute
- 13.00 FHR 130, Contractions 3/10 each 50 seconds, Pulse 88/minute
- 13.30 FHR 120, Contractions 3/10 each 50 seconds, Pulse 88/minute
- 14.00 FHR 130, Contractions 3/10 each 50, Pulse 90/minute, Temperature 37°C, Blood Pressure 100/70 mmHg. Fetal head 3/5 palpable above the symphysis pubis. Cervix 6 cm dilated, amniotic fluid clear. Sutures overlapped but reducible (Molding ++).

STEP 3: Plot the following information in the partogram:

- 14.30 FHR 120, Contractions 3/10 each 45 seconds, Pulse 90/minute, Clear fluid
- 15.00 FHR 120, Contractions 3/10 each 45 seconds, Pulse 88/minute, Blood-stained fluid
- 15.30 FHR 100, Contractions 3/10 each 45 seconds, Pulse 100/minute
- 16.00 FHR 90, Contractions 3/10 each 50 seconds, Pulse 100/minute, Temperature 37°C
- 16.30 FHR 96, Contractions 4/10 each 50 seconds, Pulse 110/minute. Fetal head 3/5 palpable above the symphysis pubis. Cervix 6 cm dilated. Amniotic fluid meconium stained. Sutures overlapped and not reducible. Urine output 100 mL; protein negative, acetone 1+.

STEP 4: Record the following information on the partogram:

- Cesarean section at 17.30, live female infant with poor respiratory effort and weighing 4,850 g.

Answer the following questions:

Q: What is the final diagnosis?

Obstructed labor with fetal head 3/5 palpable above the symphysis pubis.

Q: What action was indicated at 14.00, and why?

Cesarean section (CS) because Mrs. C was already in secondary arrest of dilatation and descent despite at least 3 contractions in 10 minutes, each lasting more than 40 seconds.

Q: What action was indicated at 15.00, and why?

- Continue emotional and physical support, including hydration.
- Continue attentive monitoring of maternal and fetal condition.
- Have crossed the alert line.
- Blood-stained amniotic fluid.

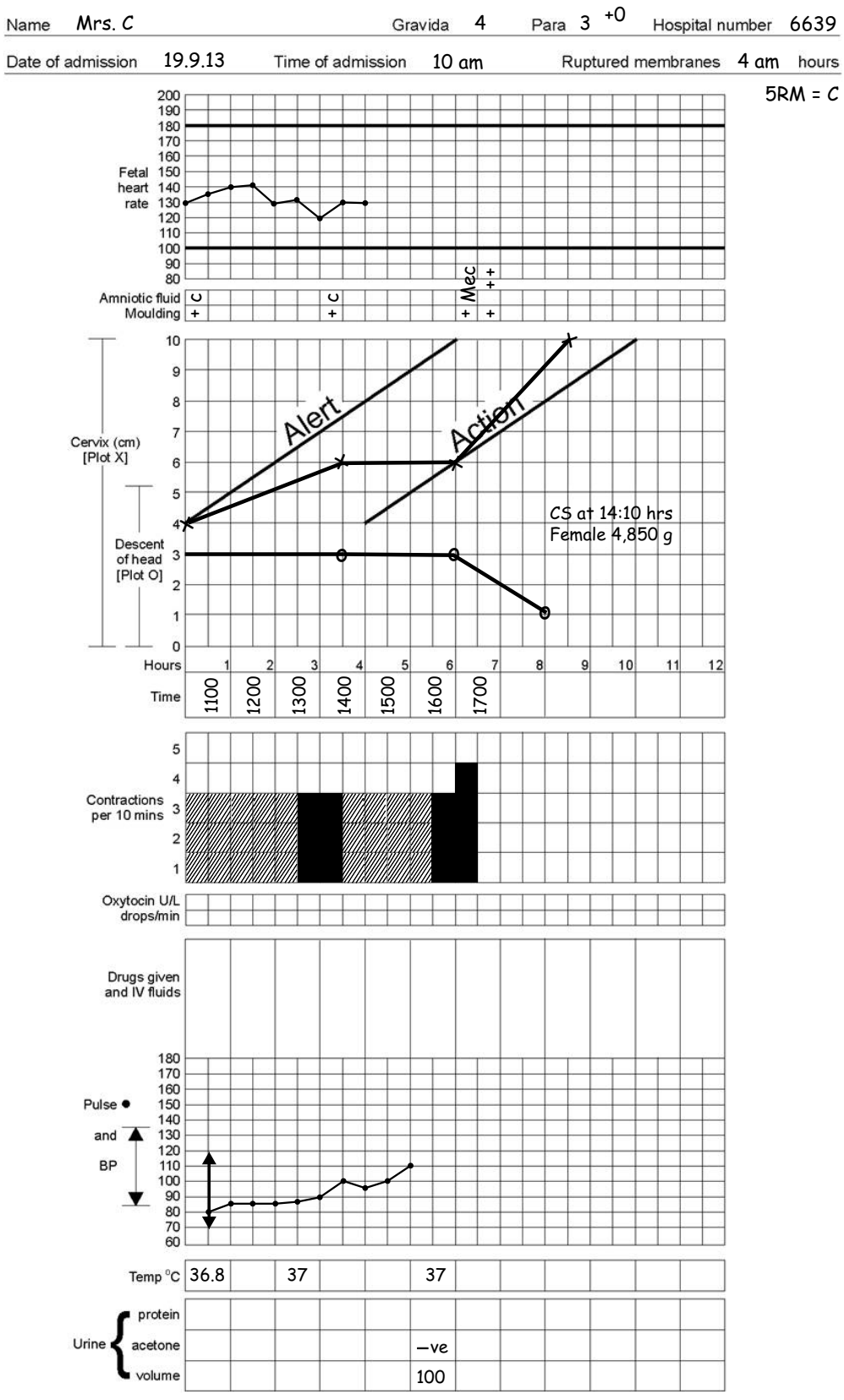
Q: At 17.00, a decision was taken to do a cesarean section, and this was rapidly done. Was this a correct action?

Yes, it was correct because of the following: the fetal condition was deteriorating, failure to progress, and a rising maternal pulse.

Q: What problems may be expected in the newborn?

Asphyxia, meconium aspiration.

CASE 3


Name Mrs. C
Gravida 4
Para 3 +0
Hospital number 6639
Date of admission 19.9.13
Time of admission 10 am
Ruptured membranes 4 am hours
5RM = C
Fetal heart rate
Amniotic fluid
Moulding
C
Mec
Cervix (cm) [Plot X]
Descent of head [Plot O]
Alert
Action
CS at 14:10 hrs
Female 4,850 g
Hours
Time
1100
1200
1300
1400
1500
1600
1700
Contractions per 10 mins
Oxytocin U/L drops/min
Drugs given and IV fluids
Pulse
and
BP
Temp °C
36.8
37
37
Urine
protein
acetone
volume
–ve
100

Closing

Unit 5: Evaluations

Time

2 hours

Objectives

At the end of this unit, participants will be able to:

- Demonstrate theoretical competence in assisted vaginal delivery via vacuum extraction.
- Demonstrate practical competence in assisted vaginal delivery via vacuum extraction.
- Explain how the training met participants' expectations and course objectives.

Materials

This session requires all of the supplies listed below.

- Two pelvic models (more if possible)
- OmniCups
- Bird manual vacuum extractors
- Gloves
- Gauze
- Dish soap
- Talcum or baby powder
- Surgical drapes
- *Vacuum Extraction Checklist*, one copy of handout for each participant
- *Post-test,* one for each participant

Instructions

1. Distribute a list with participant names with appointments for the individual competency assessment in 10-minute slots. Prepare the list the day before. Divide the participants between the two facilitators.

2. Prepare two vacuum extraction simulation set-ups for the evaluations during the lunch break on Day 2.

3. Ask the participants to complete the *Post-test*. After completing the test, the participants can take a break until it is their turn for their individual competency assessment.

Unit 6: Closing

Time
45 minutes

Objectives
At the end of this unit, participants will be able to:

- Reflect how the training met their expectations and the course objectives.

Materials
- Flip chart paper
- *Course Evaluation*, one for each participant
- *Certificate of Attendance*, one for each participant

Instructions
1. Thank the participants for their attention and participation in the short course. Take 10 minutes to review the answers on the *Post-test* and explain the tests will be used to assess changes in participants' knowledge after participating in the course.

2. Conduct a short process evaluation for how the training went.

> **Note to Trainer:** As an optional activity, draw a line down the center of a piece of flip chart paper. Write a (+) on the left and a (–) on the right side. Ask participants what went well today or things they would like to give a word of thanks for. Record responses on the (+) side. Ask participants what could have been better today or things they would like to see improved. Record responses on the (–) side.

3. Distribute the *Course Evaluation*. Ask the participants to take a few minutes to fill it out and provide feedback on the areas of the training that went well and the areas that could benefit from changes or improvement.

4. Present each participant with a prepared *Certificate of Attendance* and shake his or her hand.

Sample Certificate of Completion

Certificate of Attendance

[Recipient Name]

attended a two-day clinical refresher course on

Assisted Vaginal Delivery via Vacuum Extraction

Attendance at this training course does not indicate competency in performing this clinical skill.

IAWG INTER-AGENCY WORKING GROUP ON REPRODUCTIVE HEALTH IN CRISES

Presented by:

On this day:

References

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