# Education material for teachers of midwifery

Midwifery education modules - second edition

# Managing prolonged and obstructed labour

International Confederation of Midwives

World Health Organization

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## TABLE OF CONTENTS

# INTRODUCTION

## INTRODUCTION

Every year it is estimated that worldwide, more than 500 000 women die of complications of pregnancy and childbirth. At least 7 million women who survive childbirth suffer serious health problems and a further 50 million women suffer adverse health consequences after childbirth. The overwhelming majority of these deaths and complications occur in developing countries.

To support the upgrading of midwifery skills so that countries can respond to this situation by strengthening maternal and newborn health services, a set of midwifery training modules was developed by the World Health Organization (WHO). The need for the modules was identified by the midwives and teachers of midwives from around the world who attended the Pre-Congress Workshop on Midwifery Education: Action for Safe Motherhood, held in Kobe, Japan in 1990 under the joint sponsorship of WHO, the International Confederation of Midwives (ICM) and the United Nations Children's Fund (UNICEF). The framework for midwifery education developed at the workshop formed the basis for the modules.

The modules, while primarily intended for in-service training programmes for midwives and nurse-midwives, can also be used in basic and post-basic midwifery programmes. In addition, the modules can be used to update the midwifery skills of other health care professionals. It is important to note, however, that they are not meant to replace midwifery textbooks which deal with other aspects of care during pregnancy, childbirth and the postnatal period, but are instead intended to serve as the basis for teaching midwives and midwife trainees, or others requiring these specific midwifery skills, to respond appropriately to major causes of maternal mortality such as haemorrhage, abortion complications, obstructed labour, puerperal sepsis and eclampsia. The modules can also be used for updating the knowledge and skills of midwifery teachers.

The modules aim to help midwives and others develop into skilled practitioners who are able to think critically and make clinical decisions on the basis of sound knowledge and understanding of these complications. Nonetheless, it is assumed that midwives and midwife trainees who undertake training using the modules, will already have gained proficiency in most of the basic skills such as measuring blood pressure, performing a vaginal examination, conducting a normal delivery and prevention of infection. Therefore, when using the modules for basic midwifery programmes, these skills should be taught first.

A variety of other skills are included in the modules because they are considered essential to comprehensive midwifery practice. In some countries some of these skills may not be a part of midwifery practice and, indeed, may be seen as the responsibility of the medical practitioner rather than of the midwife. However, the modules have been developed based on the belief that, in addition to basic midwifery skills, midwives require a range of life saving skills to enable them to make a significant contribution to reducing maternal deaths and to promoting safe motherhood.

In the original series released in 1996, there were five modules. More recently, a further module on managing incomplete abortion was added. The modules were updated in 2001–2002, in line with recent evidence and the WHO guideline for *Managing complications in pregnancy and childbirth: a guide for midwives and doctors*. The foundation module deals with the midwife in the community, while the technical modules each cover specific problems which may lead to maternal death. It is estimated that the foundation module will

require a minimum of two weeks for effective teaching and learning, while each technical module will require from ten days to two weeks. These time frames may vary depending on factors such as the ability of students and the resources available to support the teaching–learning process and the schedule of the teaching–learning programme.

Each of the modules is self-contained and can, if necessary, be taught independently of the other modules. They are, however, intended to complement each other, since together they present a comprehensive approach to dealing with the major causes of maternal mortality and morbidity. It is therefore advisable to use the modules in a way that will enable midwives to work through all of them.

All of the skills covered in the modules are necessary if midwives are to be effective in giving prompt and appropriate care to women who experience complications of pregnancy and childbirth, and to comply with the international definition of skilled attendant[1] for pregnancy, childbirth and postnatal care. Nevertheless, it may be that in some countries midwives are not legally authorized to perform all of the required skills. In these countries the modules will need to be adapted to conform to local regulations relating to midwifery practice, while at the same time, efforts should be made to introduce legislative changes to ensure that midwives are allowed to perform these required skills.

## STRUCTURE OF THE MODULES

All the modules have the same structure, with the exception of the foundation module which follows a slightly different pattern from the others. The foundation module does not deal with a specific clinical problem, but with the general issue of maternal mortality, the factors which contribute to it, and the importance of working with the community to help make motherhood safer. The sessions in this module are therefore structured around these topics.

The technical modules deal with specific clinical problems and follow a common framework; each begins with an introduction to the specific problem which is then followed by sessions on the related avoidable factors, identifying the problem, managing the problem, and learning the required clinical skills.

The sessions in all of the modules are presented in the following way:

Introduction and outline to the session which describes:

**Aims** – aim of the specific session.

**Objectives** – on completion of each session what the student will be able to do.

**Plan** – outline plan for the session.

**Resources** – student instructions and worksheet, puzzles and textbooks

[1] A skilled attendant is a health professional with midwifery skills, such as midwives, and those doctors and nurses who have been educated and trained to proficiency in the skills to manage normal (uncomplicated) pregnancies, childbirth and the immediate postnatal period and to identify, manage or refer complications in the woman and newborn. (*Making pregnancy safer: the critical role of the skilled attendant. A joint statement by WHO, ICM and FIGO*. Geneva, World Health Organization, 2004).

***Instructions for the teacher*** (text in italics): explain step-by-step how to lead the session, and sometimes includes suggested methods for assessment of learning.

**Supplementary material for the teacher** (normal text): gives details of the teaching content for both theory and practice.

**Instructions for students** (labelled as "Instructions for Students", or "Instructions for Group Work"): provide guidelines for individual or group activities.

## CONTENT OF THE MODULES

### The midwife in the community

The module begins with the Story of Mrs X which shows how certain social, economic and cultural factors, combined with delays in seeking and obtaining medical care put mothers at risk of complications which frequently lead to death. The theme from the story is then reinforced throughout the remainder of the module. Special emphasis is given to the role of midwives in promoting safe motherhood in the community by helping individuals, families and other community members understand and contribute to safe motherhood.

There are sessions covering specific topics such as the place and value of women in society; advancing safe motherhood through human rights; traditional beliefs, practices and taboos affecting the health of women during pregnancy and childbirth; the recognition and reduction of risk factors; the concept of delay as it relates to maternal death; and HIV/AIDS and safe motherhood. Additional sessions include the use of community profiling for planning community-based care and for evaluation of that care.

### Managing postpartum haemorrhage

In order that students may fully understand how postpartum haemorrhage occurs, this module begins with a detailed explanation of the physiology and management of the third stage of labour. Students then learn what postpartum haemorrhage is, how it occurs, what factors contribute to it, how it can be identified, and the critical points for management.

The skills specific to preventing and managing postpartum haemorrhage include: identification of the factors which place women at risk for postpartum haemorrhage; management of the third stage of labour; massaging the uterus and expelling clots; applying bimanual compression to the uterus; applying manual compression to the aorta; suturing perineal tears; suturing an episiotomy; repair of cervical and high vaginal tears; and manual removal of the placenta. The general skills in this module include: urinary catheterization; taking and recording observations; taking blood samples for analysis; setting up and monitoring intravenous infusions; monitoring blood transfusion; universal precautions for prevention of infection, and maintaining records. Some of these general skills are also included in the other technical modules.

### Managing prolonged and obstructed labour

This module begins with a review of the anatomy and physiology relevant to the management of prolonged and obstructed labour. On the basis of this, the module explains what makes obstructed labour more likely to occur, what

happens in obstructed labour, how signs of obstructed labour can be identified, and steps to be taken for effective management. Special emphasis is placed on the use of the partograph in monitoring labour.

The skills specific to preventing and managing prolonged and obstructed labour include: identification of risk factors; assessing pelvic outlet; diagnosing presentation and position of the baby; assessing descent of the fetal head; recognizing obstructed labour; and vacuum extraction. The general skills in this module include: urinary catheterization; taking blood samples for analysis; setting up and monitoring an intravenous infusion; administering necessary drugs; maintaining fluid balance; universal cautions for prevention of infection; and maintaining records.

### Managing puerperal sepsis

This module begins with an explanation of the problem of puerperal sepsis. The content then covers the factors which contribute to the infection, how it can be identified and differentiated from other conditions, how it can be prevented and, if it does occur, how it can be managed. A session on HIV and AIDS, related to childbearing women, is also included.

The skills specific to preventing and managing puerperal sepsis include: identification of risk factors; identification of symptoms and signs; taking a midstream specimen of urine; taking a high vaginal swab; and maintaining vulval hygiene. The general skills in this module include: taking and recording observations; taking blood samples for analysis; setting up and monitoring an intravenous infusion; maintaining fluid balance; universal precautions for prevention of infection; administering necessary drugs; preventing thromboembolic disorder; and maintaining records.

### Managing eclampsia

This module begins with an explanation of the conditions pre-eclampsia and eclampsia. The content then covers the factors which contribute to eclampsia, how it can be identified and differentiated from other conditions, how it can be prevented and, if it does occur, how it can be managed.

The skills specific to preventing and managing eclampsia include: identification of risk factors for pre-eclampsia and eclampsia; midwifery observations; and care and observation during a fit. The general skills in this module include: taking blood samples for analysis; setting up and monitoring an intravenous infusion; administering necessary drugs; urinary catheterization; preventing thromboembolic disorder; universal precautions for prevention of infection; and maintaining records.

### Managing incomplete abortion

This module begins with an explanation of abortion, including the types of abortion, the effect of abortion on maternal mortality and morbidity, the prevention of unwanted pregnancy, laws and regulations related to abortion, sociocultural and religious perspectives, and the role of midwives in abortion care, with particular emphasis on emergency abortion care. The content then covers the factors which contribute to abortion, how it can be identified and differentiated from other conditions, how it can be prevented and, if it does occur, how it can be managed.

The skills specific to managing incomplete abortion include: manual vacuum aspiration, and post-abortion family planning counselling and methods. The following skills, which are also in the postpartum haemorrhage module, are included because they may be necessary when managing incomplete abortion: applying bimanual compression to the uterus; applying manual compression to the aorta; and repair of cervical and high vaginal tears. The general skills in this module include: taking and recording observations; taking blood samples for analysis; setting up and monitoring intravenous infusions; monitoring blood transfusions; administering drugs, urinary catheterization; preventing thromboembolic disorder; universal precautions for prevention of infection; and maintaining records.

## TEACHING–LEARNING METHODS

The modules propose a range of teaching–learning methods designed to maximize student involvement in the teaching–learning process, based on principles of adult learning. There is an emphasis in the modules of applying theory to practice, thus adequate time in the clinical areas and visits to the community are an essential part of the teaching–learning process, and careful attention and advanced preparation is required for this component, as it is for the theory content.

### Modified lectures

Modified lectures are used in the modules to introduce new information and to review content that students may already be familiar with. They include strategies such as brainstorming, buzz groups, question and answer sessions and discussion which involve students in their own learning. The modules include a variety of visual materials for the teacher to use in order to make their sessions as interesting as possible.

The teacher may wish to augment the lecture content included in the modules with information from other sources, or simply follow the outline provided. In either case it will be important to prepare in advance for each session by reading the relevant content and reference materials, and by ensuring that resources for students are available if required.

### Discussions

It is important to allow time for discussion at appropriate points during, or at the conclusion of, teaching sessions. This will provide an opportunity for students to ask questions about information that is unclear to them, as well as to make contributions on the basis of their knowledge and experience, and for the teacher to assess the views and level of knowledge and understanding of the students.

### Group work and feedback

Many of the sessions in the modules involve group work, which is usually followed by a feedback session from each group to the whole class. The groups should be kept as small as possible (preferably not more than six students per group), the aim being to provide an opportunity for students to examine a specific issue or problem. It is important to ensure that there is sufficient space for the groups to meet without disturbing each other. Each group will need a facilitator who will be responsible for keeping the discussion going and ensure

that the group completes its work. Where the facilitator is someone other than the teacher, this person should be supplied with briefing notes. In addition, it is essential the teacher rotates through each group without disrupting the discussion, to ensure the group are keeping to their brief, or to assist with any difficult questions or issues that may arise. In addition, each group will require a rapporteur who will take notes and provide feedback to the class as a whole. Specific instructions are provided in the sessions which involve group work.

### Tutorials

A tutorial is an informal teaching–learning session between a teacher and a student or a small group of students. Tutorials are time-consuming but are essential for discussing students' progress. Tutorials usually follow a specific learning activity and give students an opportunity to express their concerns to the teacher and, in turn, give the teacher an opportunity to get to know each student better, particularly in relation to the progress being made. Tutorials are included in each of the modules, but not in all sessions.

### Practical exercises

Practical exercises provide an opportunity for students to demonstrate their knowledge and skill related to a particular topic. It is important in these situations to provide clear instructions to the students about the exercises to be undertaken and to monitor their progress and provide help when required. The foundation, postpartum haemorrhage, management of prolonged and obstructed labour, and management of incomplete abortion modules include practical exercises.

### Community visits

Community visits are intended to be both instructive and enjoyable experiences for the students. The foundation module includes a series of community visits aimed at helping students understand how the concepts in this module apply in the community. Community visits must, however, be planned and organized well in advance, including the choice of an appropriate community, seeking authorization from the relevant authorities to visit the community, and contacting a key person who is able to facilitate and supervise the student activities in the community. Another important consideration is the availability of transport to take students to and from the community.

The teacher may choose to organize the community visits so that they are implemented on consecutive days, rather than at the intervals suggested. If this change is made, it will be important to ensure that it does not interfere with the achievement of the learning objectives for the module.

### Clinical teaching

Clinical teaching is extremely important in the technical modules because the clinical skills students learn can mean the difference between life and death for the women in their care. The underlying theory for each of the skills in the modules should be taught in the classroom and, where possible, the skills themselves taught in a simulated clinical setting prior to taking the students to the real clinical area. Facilities where clinical practice is to take place should be chosen on the basis of the anticipated availability of women with conditions included in the modules. However, even with the best of planning, it will not always be possible to guarantee hands-on experience for every

student for the full range of skills. It will be important, therefore, to consider other opportunities for students to learn the necessary skills, for instance by simulation and local mechanism to gain appropriate clinical experience following completion of the course.

Arrangements with the staff at the health facilities where clinical teaching is to take place must be made in advance. Moreover, the students' visits to these facilities for the purpose of clinical practice should not disturb routine client care. When students are learning and practising hands-on skills, supportive supervision must be provided by the teacher or by other trained and experienced staff until competency in the relevant skills has been achieved.

### Drama and role play

Drama and role play may be used to emphasize points made by the teacher. In both cases students are asked to act out a real or imaginary situation. In drama, students make up their own characters and to some extent their own story in order to illustrate a particular point. In role play, students take the part of specific individuals such as the midwife, the village leader, the distressed relative or the worried mother. This provides students with an opportunity to view and understand situations, issues and/or problems from the perspective of others. Drama and role play are included as optional activities in several of the modules.

### Case studies

The technical modules provide students with the opportunity to present case studies as the basis for evaluating the effectiveness of care in specific situations. Students will be able to learn from their own experience as well as from that of others. The intention of case studies is not to criticize the practice of others; instead, students should be encouraged to look at past practice and see what lessons can be learned for the future. The case studies should be based on client records selected to demonstrate the management of particular conditions (e.g. eclampsia). It should be noted that client confidentiality must be maintained throughout the presentation of case studies.

### Learning games and puzzles

Learning games and puzzles provide interactive and enjoyable means for students to gain new knowledge, and to review and consolidate existing knowledge. The learning games and puzzles in the modules will be new to the teachers who use them, and it is therefore important that they become familiar with them in advance. In particular, it is important that the teacher be able to provide a clear explanation to students as to the use of the games and puzzles to be used, and to monitor progress during the activity.

### Workshops

A workshop is a period of planned activity on a specific topic, often with a presentation by one or more guest speakers. Where workshops are recommended the content and programme are suggested. Workshops require careful planning with regard to the content, timetable, and facilities. The puerperal sepsis and eclampsia modules include workshops in the session on care plans.

### Reflection

Learning occurs as a result of reflecting on experience. Students should therefore be encouraged to reflect on their experience in clinical practice and record their reflections in a diary or notebook. These reflections can be used as a basis for discussion with tutorial staff and/or peers. A framework for reflection includes selecting an experience, identifying their own feelings and thoughts about that experience, feelings and thoughts of others, and then evaluating what was good and what was bad about the experience. Next, the student is encouraged to try to make sense of the experience by analysing why it was good and/or bad, and determine what else could have been done in the situation to improve the outcome. Finally, an action plan is made for future practice when a similar situation arises. Discussing the experiences recorded in their reflective diaries either in groups or with a teacher helps to give students different perspectives on their experience. A summary of such discussions should be added to the recordings in the diary to help with recall at a later date.

## ASSESSMENT OF STUDENTS

### Pre- and post-tests

Pre-tests provide a useful means of establishing a baseline for students' theoretical knowledge. The same questions used in the pre-test should be used again in the post-test to assess knowledge on completion of the module. The teacher may also wish to add additional questions to the post-test. It should be noted that during the teaching–learning process, other options for assessment (see below) should be used, in particular to determine the progress being made by each student as the course continues. Examples of pre- and post-test questions are included in each of the technical modules.

### Assessing clinical competence

The assessment of clinical competence constitutes the major component of student assessment in the technical modules. Throughout the sessions which involve the teaching of clinical skills in the modules, there are sections entitled Assessing Competence. These sections provide guidelines for teachers to assess the clinical competence of students, following the teaching of a specific clinical skill. Where possible, the teacher should observe the performance of skills in a clinical setting. However, this may not always be possible, because clients with the particular conditions included in the modules may not always be available at the appropriate time. In these circumstances teachers should attempt to provide simulated situations which offer the opportunity for students to practice and be assessed in the relevant skills. Trained staff in the clinical areas may also be involved in the assessment of the students' clinical competence.

### Other options for assessment

Other options for assessment will be available during group work, such as tutorials, student seminars, learning games and quizzes, and during community visits. These activities provide vital opportunities for the teacher to monitor the progress of students in terms of achieving the learning objectives of particular sessions in the modules.

## PLANNING FOLLOW-UP ACTIVITIES

Comprehensive midwifery practice relies on experience, as well as knowledge and skills. Experience is what the students will gain as they put into practice what they have learned from these modules, when they return to their respective places of work.

It is precisely when they begin to put their knowledge and skills into practice that the midwives will come across situations that may raise questions for them. For example, there may be issues and problems which they would like to discuss with supervisors and more experienced practitioners, in order to seek solutions and improve practice. This may be particularly applicable for midwives and nurse-midwives who, at the end of the training course, still require additional hands-on clinical experience in some of the skills included in the modules.

Therefore, a follow-up meeting, perhaps six months after the end of the course, will be important to enable the students to share experiences, report on successes, review progress, and discuss problems related to practice. Other follow-up meetings may also be appropriate, perhaps after one year, and even again after two years.

## SUMMARY OF MODULE

| Session | Teaching–Learning methods | Time frame (approximate) |
|---|---|---|
| 1. UNDERSTANDING PROLONGED AND OBSTRUCTED LABOUR | Modified lecture, practical exercise and discussion | 3 hours |
| 2. AVOIDABLE FACTORS | Modified lecture<br>Group work<br>Feedback and discussion | ½ hour<br>1 hour<br>1½ hours |
| 3. IDENTIFYING THE PROBLEM | Modified lecture, discussion<br>Clinical teaching<br>Optional quiz | 2 hours<br>Several days |
| 4. PREVENTING PROLONGED AND OBSTRUCTED LABOUR | Modified lecture, practical exercises<br>Clinical teaching | 8 hours<br>Several days |
| 5. MANAGING PROLONGED LABOUR | Modified lecture, discussion | 2 hours |
| 6. MANAGING OBSTRUCTED LABOUR | Modified lecture<br>Group work<br>Drama and written exercise | 2 hours<br>1 hour<br>1½ hours |
| 7. LEARNING CLINICAL SKILLS | Lecture<br><br>Clinical teaching | 2 hours.<br><br>Approximately 2 hours per small group of students, per skill, and additional time for individual practice and assessment |
| 8. VACUUM EXTRACTION | Lecture<br>Simulated practice<br>Clinical practice | Variable, depending on students' needs |
| 9. CASE STUDIES | Case studies, discussion, group work, feedback<br>Optional tutorials | 3 hours<br><br>1 hour per student or small group of students |

## GETTING STARTED

Before beginning Session 1, you may wish to recall how the sessions are presented.

**Aims** – aim of the specific session

**Objectives** – on completion of each session what the student will be able to do

**Plan** – outline plan for the session

**Resources** – student instructions and worksheet, puzzles and text books

***Instructions for the teacher*** (text in italics), explain how to lead the session, step-by-step, and sometimes include suggested methods for assessment.

**Supplementary material for the teacher** (normal text), gives details of the teaching content for both theory and practice.

**Instructions for students** (labelled as "Instructions for Students" or "Instructions for Group Work"), provide guidelines for individual or group activities.

**Other important points to consider before you begin:**

- The time frame indicated in the plan at the beginning of each session in the module may be changed by the teacher, as required. Depending on the knowledge and abilities of students, and on their learning needs, the time required for an activity may be longer or shorter than the time specified in the plan. It is estimated that this module will require between 10 days and 2 weeks to teach.
- Ensure that any Notes for Students you wish to use are prepared in advance and are made available to your class at the beginning of the module/session.
- If you have prepared pre- and post-tests, you should refer to the appendix at the end of the module before beginning the first session in the module.
- Remember that this, and the other technical modules, are not meant to replace midwifery textbooks. It may, therefore, be helpful to have at least one such textbook available for reference as you progress through this and the other sessions in the module.

# 1 UNDERSTANDING PROLONGED AND OBSTRUCTED LABOUR

# SESSION 1
# UNDERSTANDING PROLONGED AND OBSTRUCTED LABOUR

**Aims**

- To enable students to understand why labour becomes obstructed, and what happens when this occurs.

**Objectives**

On completion of Session 1, students will be able to:

- Define obstructed labour and cephalopelvic disproportion.
- List the causes of obstructed labour.
- Describe the main anatomical landmarks of the normal female pelvis relevant to obstructed labour.
- Demonstrate, using a simple learning aid, how the fetal head normally enters the pelvic brim and explain what factors may prevent it from doing so.
- List the possible causes of abnormally shaped pelves and explain how these can interfere with the normal course of labour.
- Describe the process that occurs and the outcome anticipated in obstructed labour.

**Plan**

Modified lecture, practical exercise and discussion (3 hours).

**Resources**

This session includes learning aids which should be copied, glued to cardboard and cut out prior to the beginning of the session. In addition, a cardboard box, or obstetric model if available, and a flexible doll (obstetric doll, if available).

## INTRODUCTION

*This session offers the minimum teaching material needed to review the anatomy and physiology relevant to the management of prolonged and obstructed labour. Depending on the level of the students' knowledge and understanding, it may be necessary to allow more time in teaching and reviewing anatomy.*

*Explain that some 8% of all maternal deaths in developing countries are due to obstructed labour. This figure is an underestimation of the problem, because deaths due to obstructed labour are often classified under other complications associated with obstructed labour (such as sepsis, postpartum haemorrhage or ruptured uterus). Delayed management of obstructed labour causes fistula in surviving women, which if not treated, may make them outcasts from their community for the rest of their lives. It may also cause constant depression, many physical illnesses, infections and may even cause the woman to take her own life.*

## DEFINITIONS

*Students should understand what is meant by prolonged labour, obstructed labour and cephalopelvic disproportion.*

### Prolonged labour

Prolonged labour is most often defined as onset of regular, rhythmical painful contractions accompanied by cervical dilation where labour is longer than 24 hours. This definition however has limitations, and therefore it is more useful in terms of management to refer to prolonged stage of labour, i.e. "prolonged latent phase of labour" or "prolonged active phase of labour". Latent phase being the onset of regular painful contractions with cervical dilation up to 4 cm, and should not be longer than 8 hours. Prolonged active phase is, regular painful contractions with cervical dilation of more than 4 cm should not last longer than 12 hours without full assessment in a facility able to offer management and treatment of complications.

### Obstructed labour

Obstructed labour 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.

Complications resulting from obstructed labour can be avoided if a woman in obstructed labour is identified early and appropriate action is taken.

### Cephalopelvic disproportion

Cephalopelvic disproportion occurs when there is 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.

Cephalopelvic disproportion may be due to a small pelvis with a normal size head, or a normal pelvis with a large fetus, or a combination of a large baby and small pelvis. Cephalopelvic disproportion cannot usually be diagnosed before the 37th week of pregnancy because before then the head has not reached birth size.

Cephalopelvic disproportion may be:

- **Marginal**. In these cases the problem may be overcome during labour. Strong uterine contractions, relaxation of the pelvic joints and moulding of the fetal skull may enable the fetus to pass through the pelvis for vaginal delivery
- **Definite**. This occurs because the pelvis is too small, is abnormal in shape, or because the fetus is abnormal or too large for the pelvis through which it has to pass. Operative delivery will be necessary.

## TEACHING ABOUT PROLONGED LABOUR

### Causes of prolonged labour

It is usual to describe this as due to the three "Ps":

**Powers:** poor or uncoordinated uterine action

**Passenger:** fetal head too large or position abnormal

**Passage:** pelvis abnormal, or tumour or obstruction in pelvis or birth canal.

### Risks of prolonged labour

It is crucial to identify the cause early to be able to take the appropriate action. Unsatisfactory progress can be the earliest sign of obstructed labour.

Even when obstructed labour does not occur, excessively long labours can be harmful to both the mother and fetus, and may lead to maternal and/or fetal distress. Also where labour is long there is a higher risk of infection due to increased intervention rates, increased number of vaginal examinations, etc.

## TEACHING ABOUT OBSTRUCTED LABOUR

### Causes of obstructed labour

*The students should form small discussion groups to consider this question:*

*What are the causes of obstructed labour? Build up a list.*

Causes of obstructed labour:

- cephalopelvic disproportion (small pelvis or large fetus)
- abnormal presentations, e.g.
  - brow
  - shoulder
  - face with chin posterior
  - aftercoming head in breech presentation

- fetal abnormalities, e.g.
  - hydrocephalus*
  - locked twins*
- abnormalities of the reproductive tract, e.g.
  - pelvic tumour*
  - stenosis of cervix or vagina**
  - tight perineum.**

* Rarer causes.

** This may be associated with scarring caused by female genital mutilation, or previous "gishiri" cut.

*Students should understand the physiology of a normal delivery, i.e. what happens normally when a fetus passes through the pelvis and what happens when there is cephalopelvic disproportion.*

**Normal female pelvis**

*Identify the main anatomical landmarks for the students,* ***Figure 1.1*** *or on a model of a pelvis, if available: the sacral promontory, the ischial spines, the coccyx, the symphysis pubis and the pubic arch.*

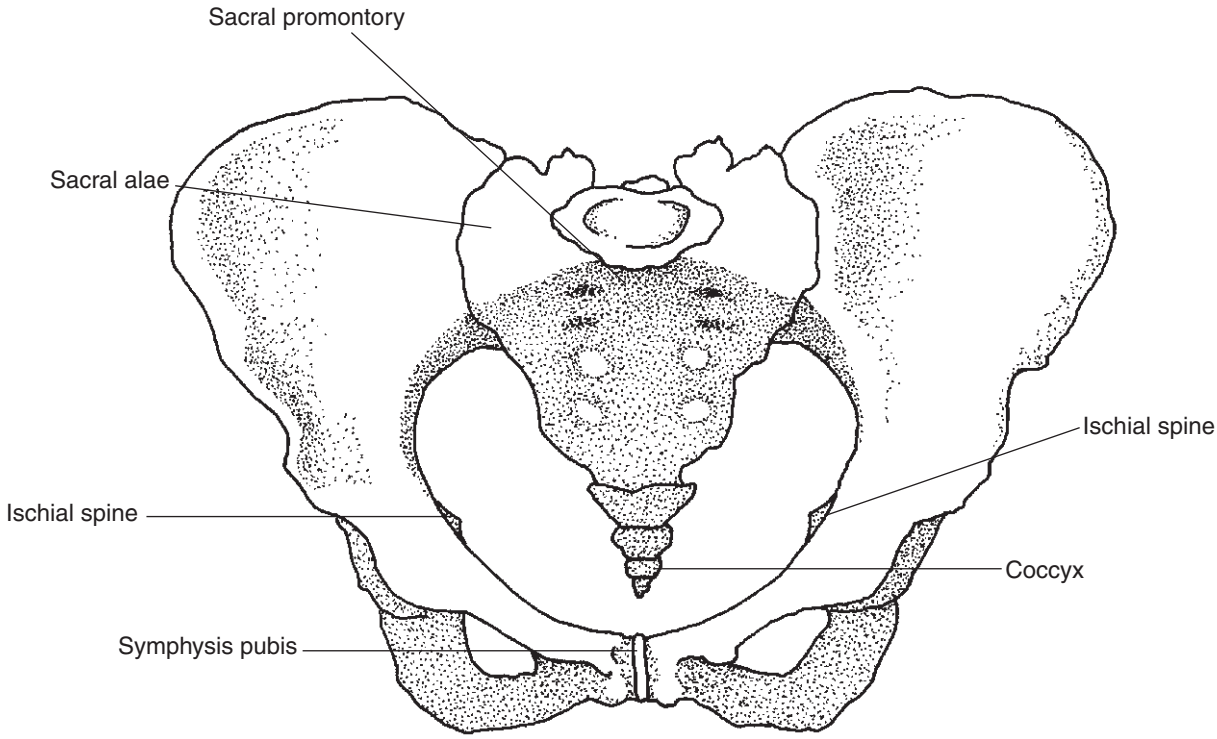



**Figure 1.1:** Normal female pelvis

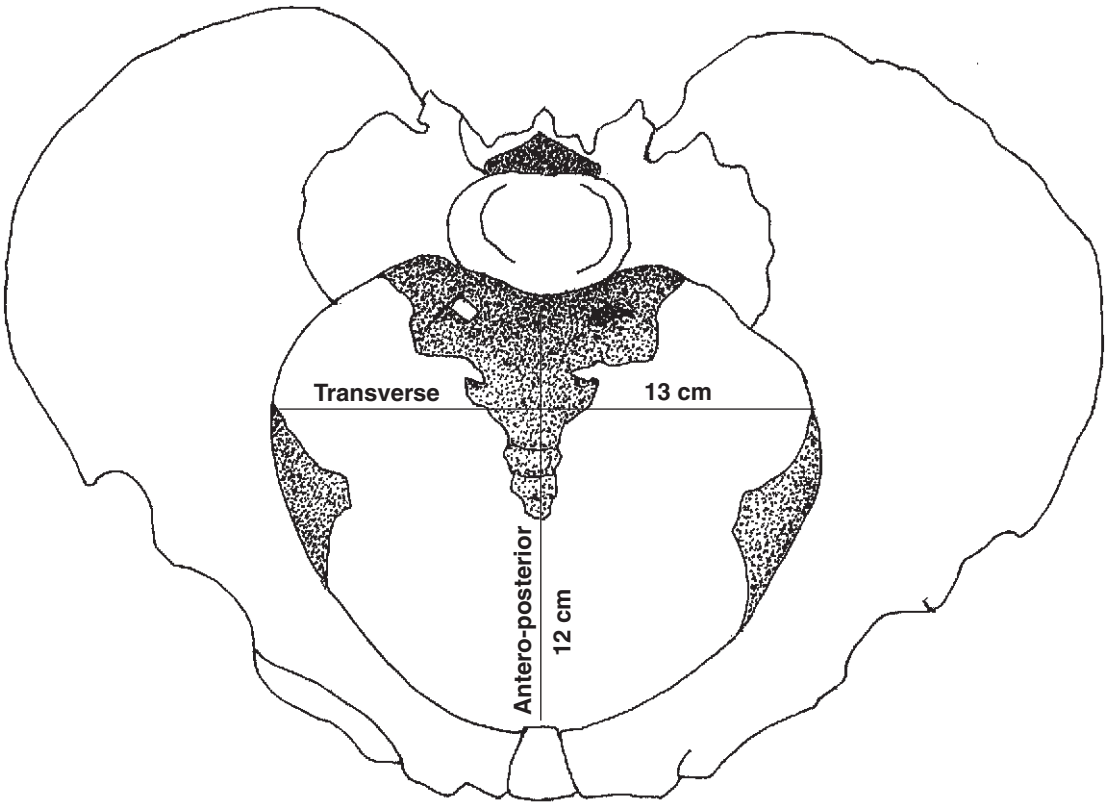



**Figure 1.2:** The pelvic inlet

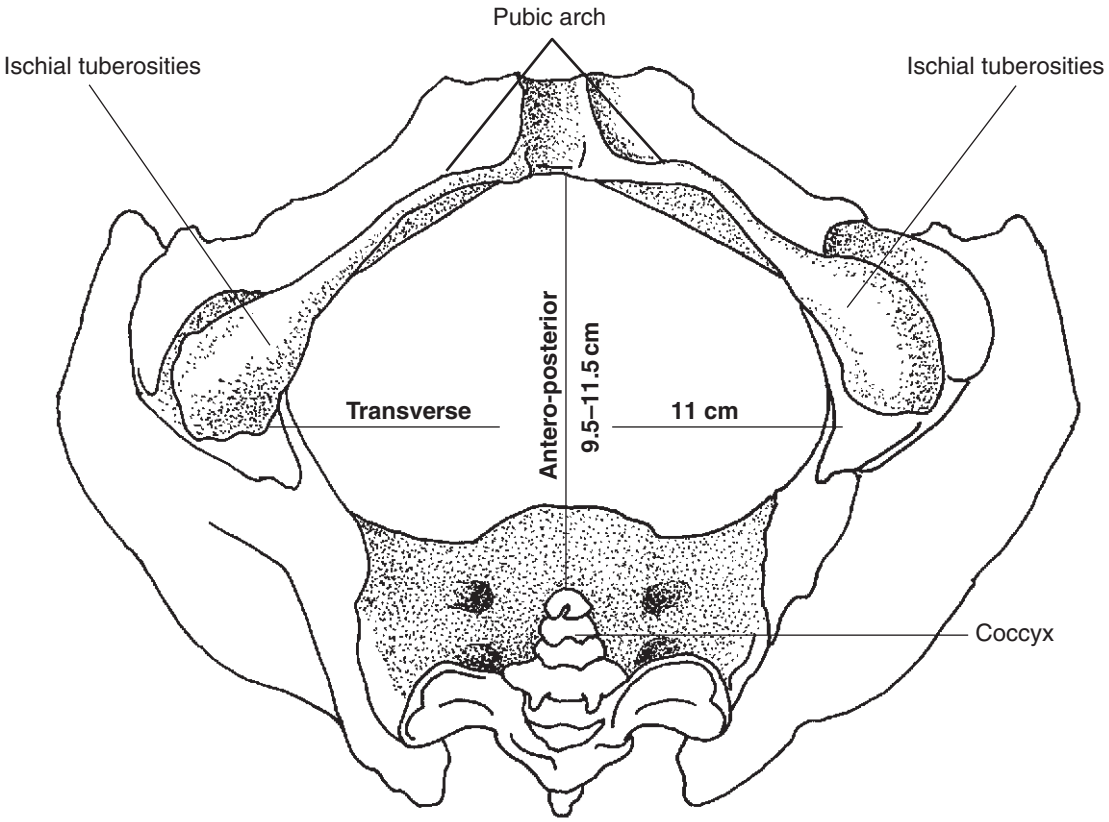



**Figure 1.3:** The pelvic outlet

The pelvic canal through which the fetus must pass during birth consists of brim, cavity and outlet.

### The pelvic brim or inlet

The pelvic brim (**Figure 1.2**) is bounded at the back by the promontory and alae of the sacrum and in front by the pubic bones. In the normal female pelvis, the brim is round except where the promontory of the sacrum projects into it.

The two most important diameters of the pelvic brim are:

1. The antero-posterior (AP)* diameter from the upper border of the symphysis pubis to the sacral promontory.
   The normal antero-posterior diameter measures 11–12 cm.

2. The transverse diameter is the widest part of the brim. It measures 13 cm.

### The pelvic cavity

The pelvic cavity is the curved canal between inlet and outlet. In the normal female pelvis the cavity is circular in shape and curves forwards. All its diameters measure approximately 12 cm.

### The pelvic outlet

The pelvic outlet (**Figure 1.3**) is diamond-shaped and is bounded anteriorly by the pubic arch which in the normal female pelvis forms an angle of 90°. Laterally the pelvic outlet is bounded by the ischial tuberosities, but the smallest diameter is between the two ischial spines which project into the outlet. The posterior landmarks of the pelvic outlet are the coccyx and the sacro-tuberous ligaments. During the birth, however, the coccyx bends backwards to increase the diameter of the pelvic outlet. The most important diameters of the pelvic outlet are:

1. The transverse diameter is measured between the two ischial spines and is normally 10.5–11 cm.

2. The antero-posterior diameter is measured from the apex of the pubic arch to the sacro-coccygeal joint and is normally approximately 13 cm.

### Movements of the fetal head during normal labour

*These fetal head movements can be taught using a cardboard box. Choose a box of the right size to represent the pelvis, and cut two holes facing each other. One hole represents the inlet (12 x 13 cm), the other represents the outlet (11 x 13 cm). A flexible doll with the same head size as a newborn is then used to demonstrate the head movements as it passes through the cardboard box (Figure 1.4). The students should take turns to use the box to show the movements of the fetus as it is born.*

* Antero-posterior means from front to back

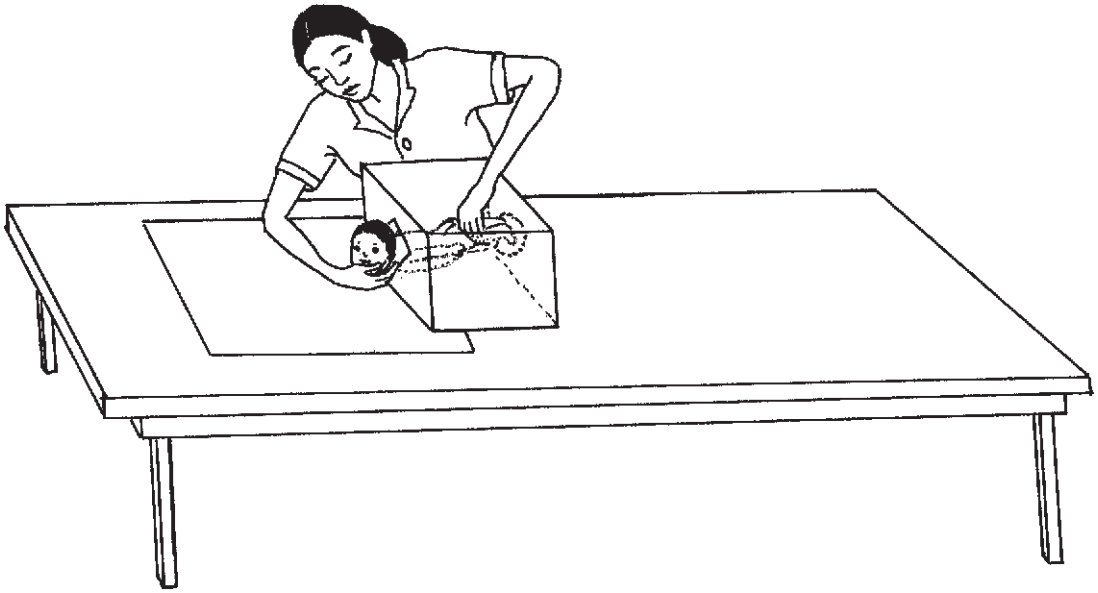


**Figure 1.4:** The "cardboard pelvis"

The fetal head is flexible and moves during labour to accommodate itself to the diameters and curves of the pelvic canal. It enters the pelvis in the widest transverse diameter of the pelvis, i.e. 13 cm, and turns before delivery so that it can emerge from the pelvis in the widest diameter, i.e. the antero-posterior diameter which is also 13 cm. The ability of the fetal skull to overlap (moulding), allows the diameter of the fetal head to reduce slightly to facilitate passage through the maternal pelvis.

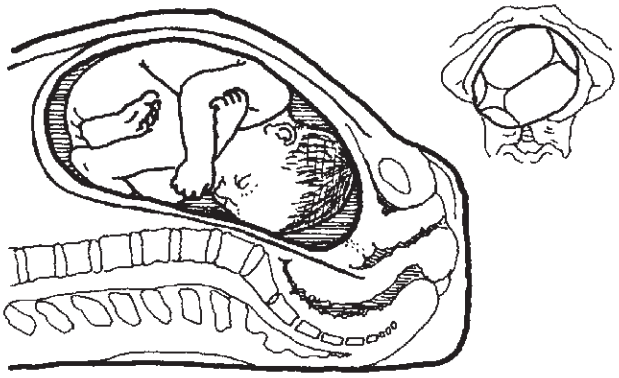
The following are the main movements of the head in occiput anterior positions (the back of the head is towards the symphysis pubis), and are also shown in **Figure 1.5**.

**Flexion (bending forward)**

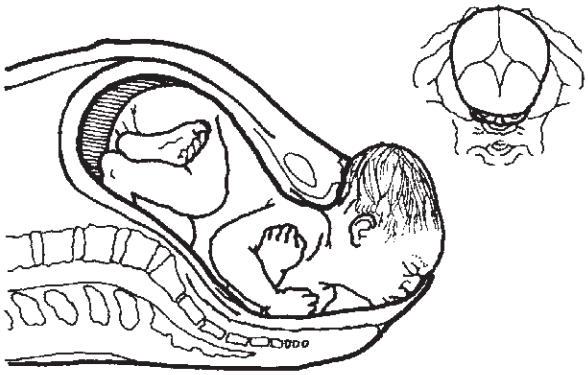
The chin is brought into contact with the fetal thorax, and this changes the presenting diameter from occipito frontal to suboccipitobregmatic (illustrate this by using **Learning Aid 1**). This smaller presenting diameter makes it easier for the fetal head to descend through the pelvic inlet. The head tends to accommodate itself better in the transverse diameter of the inlet since it is larger than the AP diameter.

**Internal rotation**

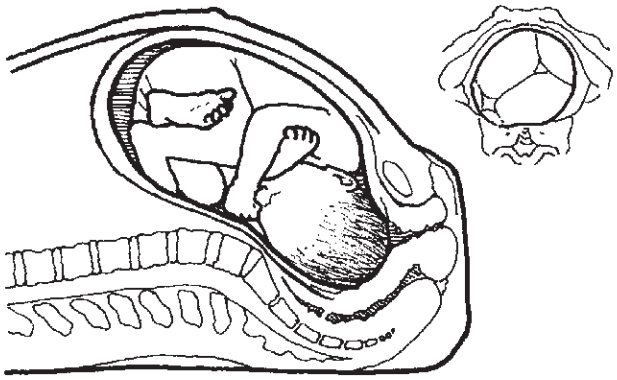
The occiput gradually rotates towards the symphysis pubis which is in the front of the pelvis. This movement occurs when the head has reached the level of the ischial spines. This movement will allow the larger diameter of the head to come out through the AP diameter of the outlet (which is the largest diameter of the outlet). The occiput slips beneath the sub-pubic arch and crowning occurs when the head no longer recedes with contractions and the widest transverse diameter is born.



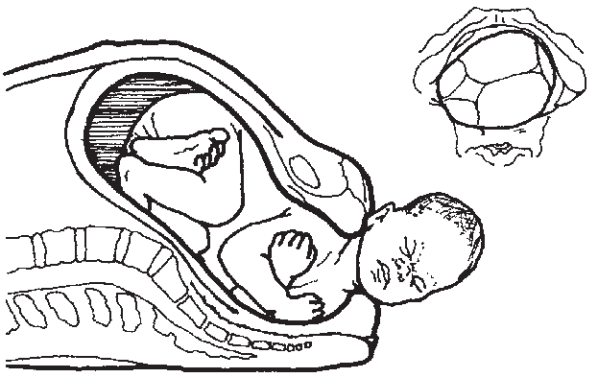
1. Head floating, before engagement



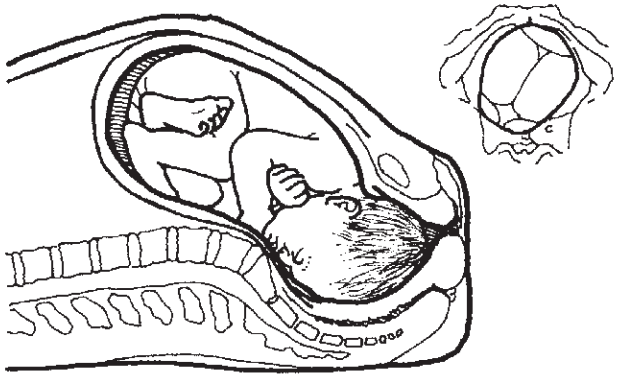
5. Complete extension



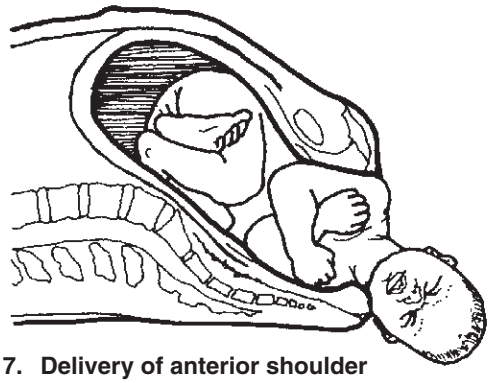
2. Engagement: flexion, descent



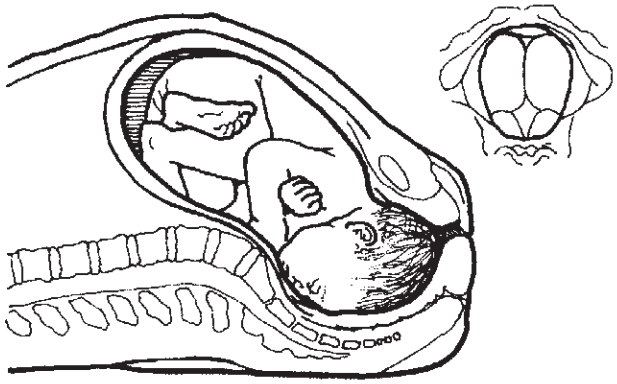
6. External rotation of head and internal rotation of shoulders



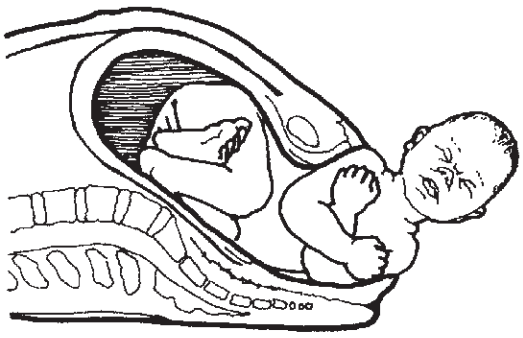
3. Further descent, internal rotation



7. Delivery of anterior shoulder



4. Complete rotation, beginning extension



8. Delivery of posterior shoulder

**Figure 1.5:** Fetal head movements during labour (left occiput anterior position)

**Extension (bending backwards)**

Once crowning has occurred the fetal head can extend. The nape of the neck pivots on the lower border of the symphysis pubis, while the forehead, face and chin pass over the thinned-out perineum. The twist in the neck of the fetus which resulted from internal rotation is now corrected by a slight untwisting movement known as restitution.

**External rotation**

The external rotation of the fetal head indicates that the shoulders are now in the antero-posterior diameter of the pelvic outlet. The internal rotation of the shoulders corresponds with the external rotation of the fetal head. If it is a vertex left occiput anterior, the fetal head will turn to the left while in a vertex right occiput anterior position it will turn to the right. Then, the anterior shoulder is born first followed by the posterior shoulder.

**Occiput posterior positions (the back of the head is towards the sacrum)**

In most cases, the movements will be the same as for occiput anterior. However, during internal rotation the occiput has to rotate much more to get to the symphysis pubis. Sometimes rotation towards the symphysis pubis is incomplete or does not take place at all (persistent occiput posterior). In this case, spontaneous vaginal delivery is difficult and assisted delivery or a caesarean section might be needed.

**Exercise**

*Divide the students into groups of two or three and give each of them a copy of* ***Learning Aid 1*** *- The "Talc Baby".*

*Assist the students to follow the instructions for making the model, and how to use "Talc Baby".*

*Each group should be able to complete instruction No. 3 and demonstrate how the "baby" can or cannot go through the pelvis for each diameter.*

*This is a pelvis of normal shape and size but students will find that the brow presentation which should be marked in red will not enter the pelvis. This is the mento-vertical diameter which measures about 13.5 cm and is larger than the largest pelvic diameter which is usually 13 cm.*

**Abnormal female pelvis**

Contraction of the pelvic diameters or any distortion that diminishes the capacity of the pelvis can cause obstructed labour. There may be contraction of the inlet, cavity, outlet, or combinations of the three.

**Small pelvis**

*When students have practised the different fetal head presentations on the normal female pelvis, give them* ***Learning Aid 2****, the small female pelvis. This pelvis is normal in shape, but small in size. There is contraction of inlet, cavity and outlet. A small pelvis may be found in adolescent mothers or women of short height.*

*Use the same "Talc Baby" and repeat the exercise.*

*The students will discover that now there is less room for the fetus to pass through and that labour may more easily become obstructed. The outcome of each labour will depend on the relationship of the size of the fetus to the size of the pelvis. A small baby may pass through a small pelvis, but this will depend on the presenting diameters. A deflexed head (with presenting diameter of 12 cm) will have difficulty passing through this pelvis. Demonstrate on the small pelvis how the baby can or cannot go through the pelvis with different head presentations.*

**Rickets**

*Now give the students **Learning Aid 3**, the pelvis affected by rickets.*

*Remind them about the skeletal changes that rickets will cause.*

Due to lack of vitamin D during childhood the bones are softened. The weight of the upper body presses downwards and the pelvis becomes misshapen. The pelvic brim is typically kidney-shaped. There is a marked reduction in the antero-posterior diameter of the brim and obstructed labour can occur. However, all other diameters (pelvic cavity and outlet) are increased. Therefore once the head is past the pelvic inlet, delivery will be fast.

The woman may also show clinical signs of rickets, such as bow legs, waddling gait, deformity of the spine. Upon vaginal examination the sacral promontory can be easily felt because it projects forward.

A similar situation can be caused by osteomalacia if there is vitamin D deficiency in adult life. All the bones of the skeleton soften and the sides of the pelvis are squashed together until the brim becomes a y–shaped slit (**Learning Aid 4**).

**Pelvis misshapen by injury or disease**

*When the students have understood the work so far, introduce them to Learning Aid 5, the pelvis affected by injury or disease. This could include injury to the spine or lower limbs, resulting in kyphosis or scoliosis of the spine.*

Again, there is a misshapen pelvis. This time, due to abnormal curves in the spine, the upper part of the sacrum will be pushed backwards and the lower part forwards. The shape of the brim may become asymmetrical and the cavity will get narrower as it goes down towards the outlet.

Injuries and diseases that can cause spinal and pelvic deformities include: fractured pelvis, fractured lower limb causing shortening of the affected limb, polio in a limb causing compensatory scoliosis, tuberculosis of the spine or hip.

### What happens in obstructed labour

*Lastly, it is important for students to understand what happens when labour is obstructed. Remind students about:*

- *the three stages of labour*
- *the latent phase of the first stage*
- *the active phase of the first stage.*

### Premature rupture of membranes

When the head is arrested at the pelvic inlet, the entire force exerted by the uterus is directed on the portion of membranes in contact with the internal os. Consequently early rupture of membranes is likely.

### Abnormalities in dilatation of the cervix

The cervix dilates slowly or not at all, because the fetal head cannot descend and put pressure on it. At the same time the cervix may become oedematous. The first stage of labour is therefore prolonged. (However, the first stage may be normal or short if, for example, obstruction occurs only at the outlet. In this case only the second stage will be prolonged). Prolonged labour causes the mother to become ketoacidotic and dehydrated.

An undilating cervix means that a caesarean will be necessary. On the other hand, if the cervix is dilating normally, this usually indicates that the obstruction has been overcome by labour and that vaginal delivery will be possible (provided there is no outlet obstruction).

### Danger of uterine rupture

When the membranes rupture and the amniotic fluid drains away, the fetus is forced into the lower segment of the uterus by contractions (**Figure 1.6**). If the contractions continue, the lower segment stretches, becomes dangerously thin and is likely to rupture. (However, uterine exhaustion may occur before that point is reached, causing contractions to become weaker or cease altogether and making the occurrence of uterine rupture less likely).

Rupture of the uterus may be complete or incomplete. If it is complete (i.e. the uterus communicates directly with the peritoneal cavity), bleeding will occur within the peritoneum. If it is incomplete (i.e. the rupture does not reach the visceral peritoneum), bleeding will occur behind the visceral peritoneum (**Figure 1.7**).

Rupture of the uterus is more likely to occur in multipara (it is very rare in nullipara), especially if the uterus is already weakened by the scar of a previous caesarean section.

Rupture of the uterus causes haemorrhage and shock. Without treatment it is fatal.

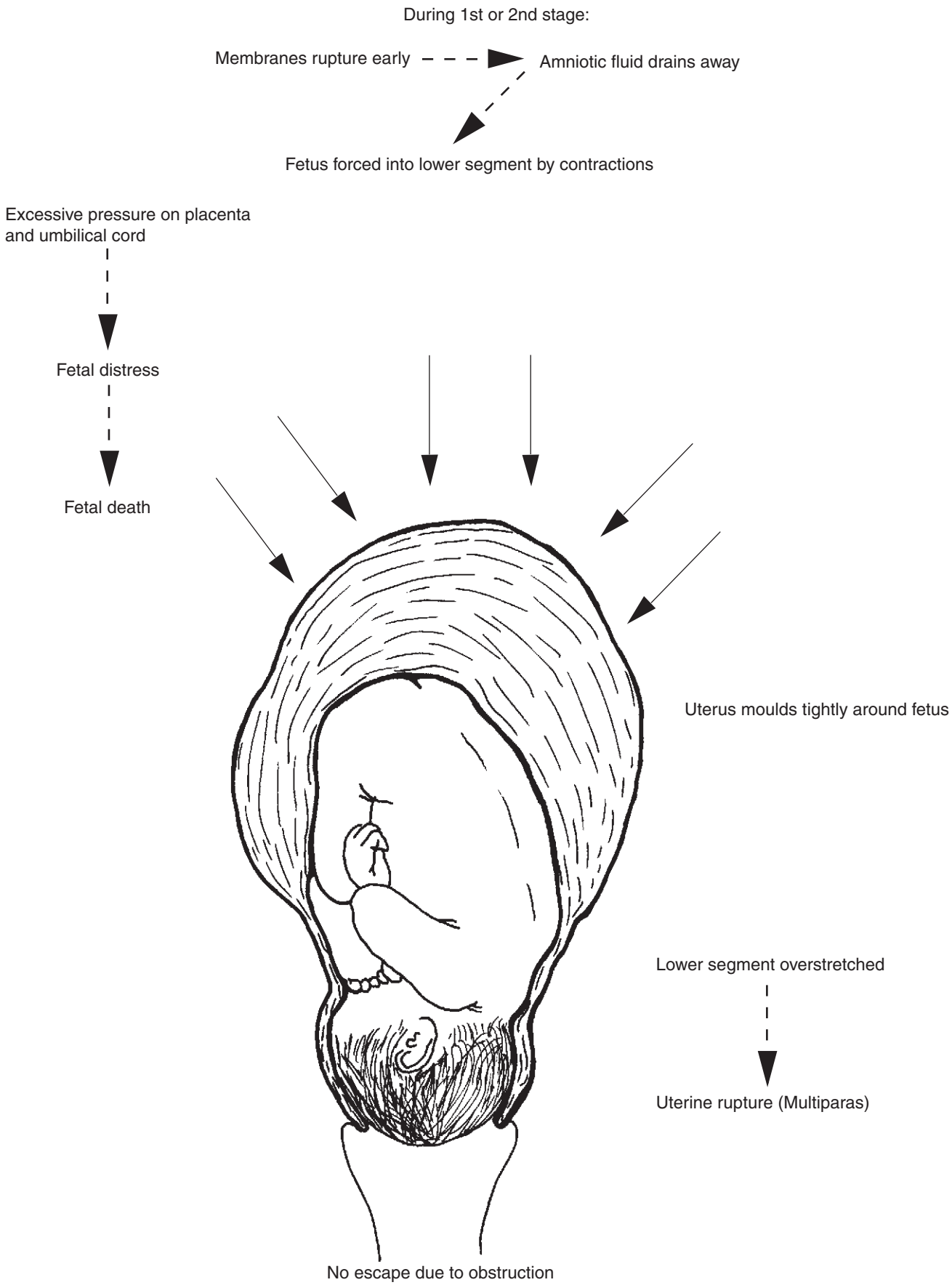



**Figure 1.6:** What happens in obstructed labour

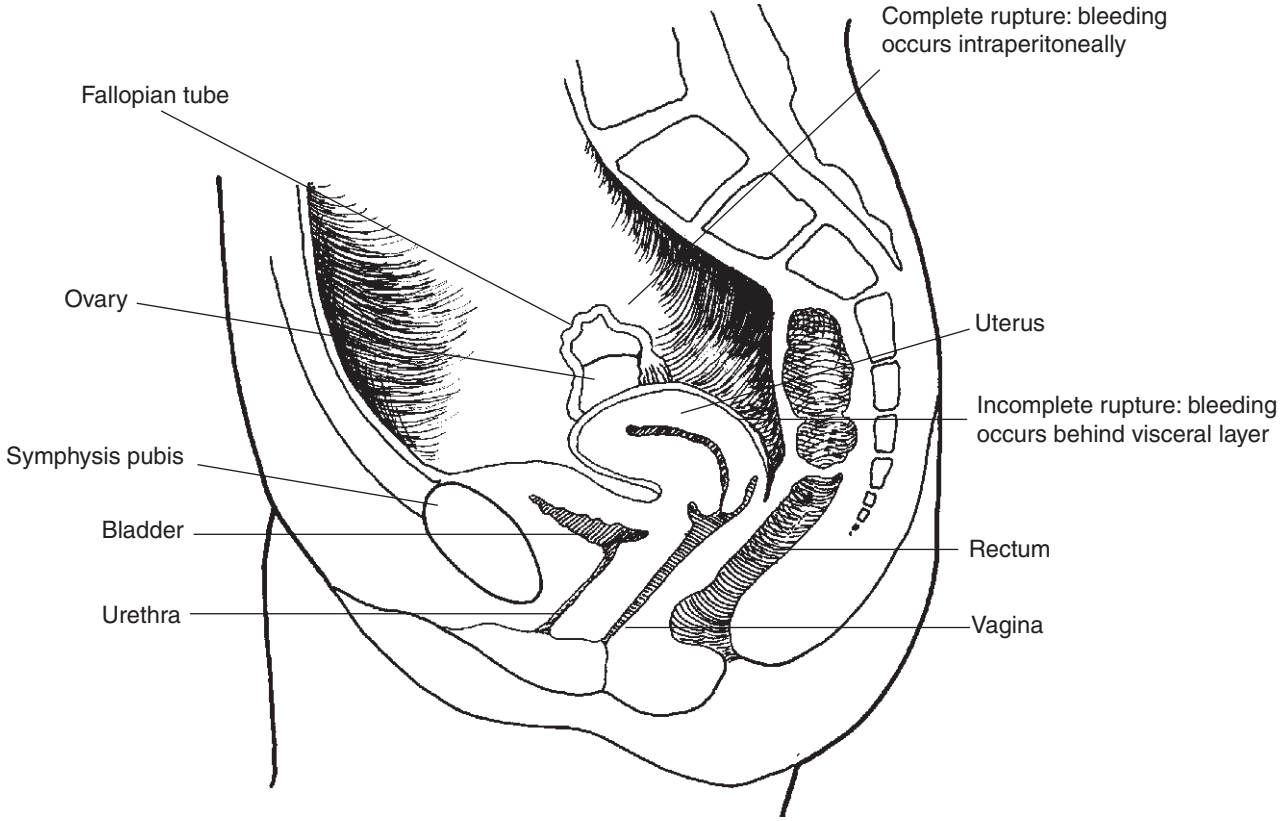



**Figure 1.7:** Sites of bleeding in complete and incomplete rupture of the uterus

## Fistulae

When the fetal head is stuck in the pelvis for a long time, portions of the bladder, cervix, vagina and rectum are trapped between the fetal head and the pelvic bones and are subjected to excessive pressure. Because the circulation is impaired, oxygenation of these tissues is inadequate and necrosis occurs, followed in a few days by the formation of a fistula. The fistulae could be vesico-vaginal (between the bladder and the vagina), vesico-cervical (between the bladder and the cervix) or recto-vaginal (between the rectum and the vagina) and allow leakage of urine or faeces from the vagina. They are most common in nullipara, especially in countries where childbearing starts at an early age. (**Figure 1.8**.)

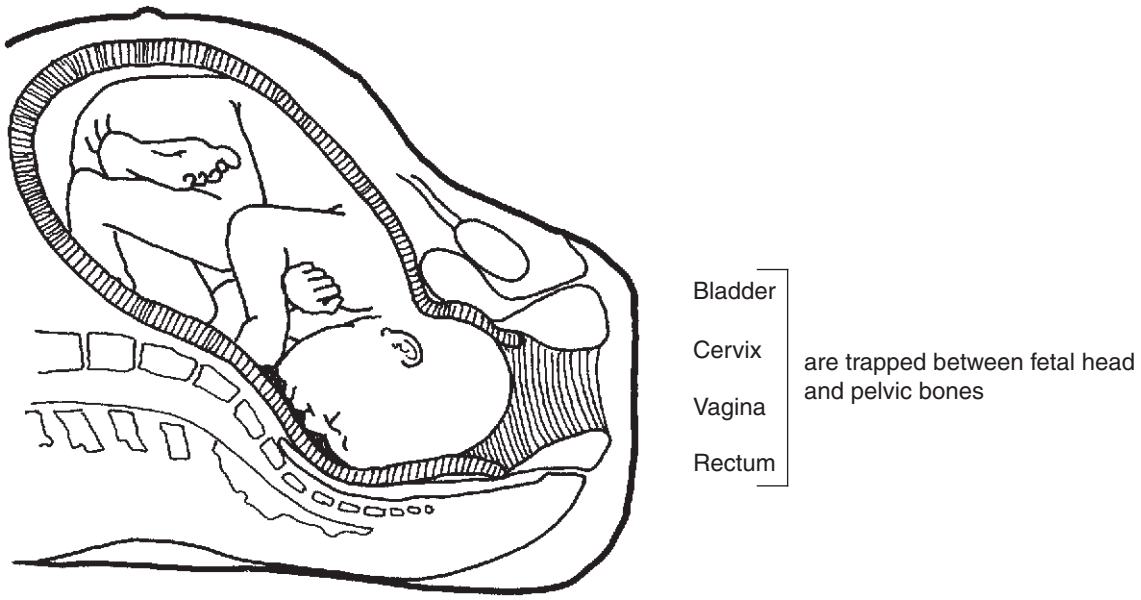



**Figure 1.8:** Fistula formation in obstructed labour

**Puerperal sepsis**

Infection is another serious danger for the mother and fetus in cases of prolonged and obstructed labour, especially as membranes are likely to rupture early. The danger of infection is increased by repeated vaginal examinations.

**Effect of obstructed labour on the fetus**

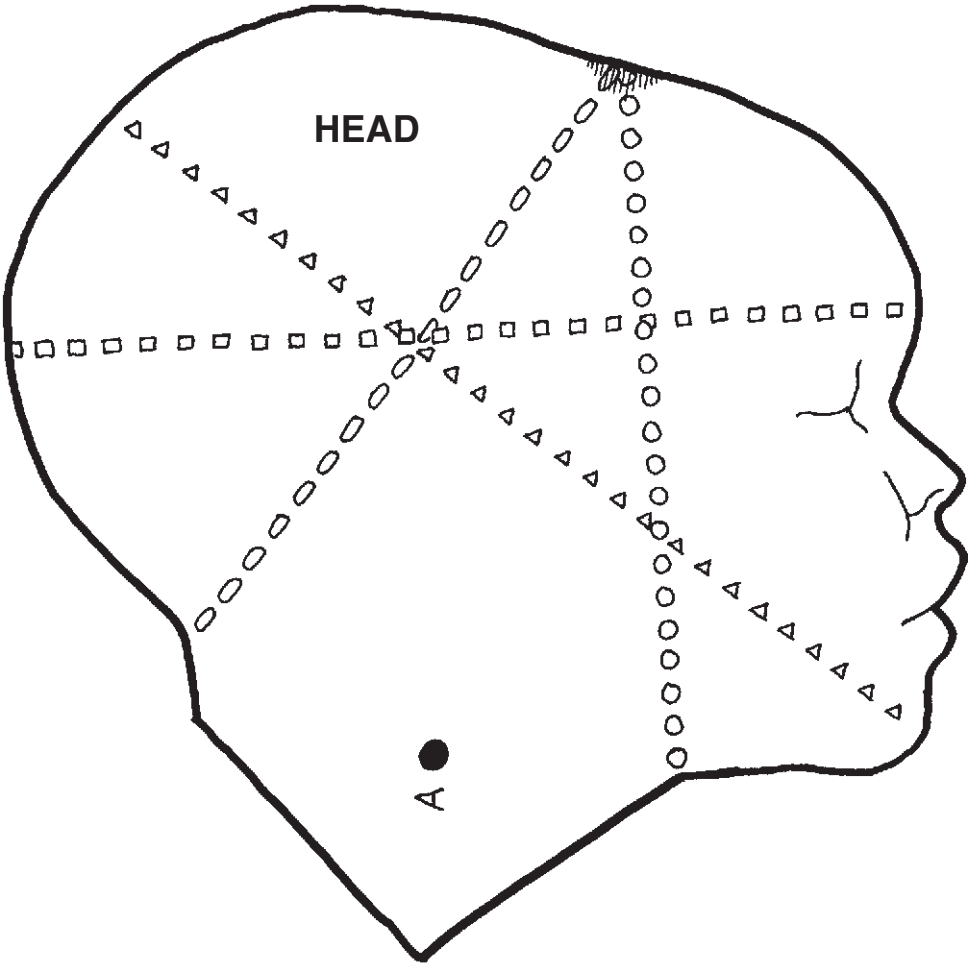
***Changes in skull and scalp:***
Due to pressure from the cervix as the head passes through the birth canal, the flexible bones of the skull overlap and moulding occurs. This changes the shape of the head and facilitates the baby's passage through the birth canal. In addition, swelling of the scalp may also occur forming what is called a caput succedaneum. This is normal and within a few days the moulding of the scalp will return to normal position and the swelling will subside. However, excessive moulding can lead to tears in the meninges, resulting in intracerebral haemorrhage and possible death.

***Fetal death:***
(Refer to **Figure 1.6**.) If obstructed labour is allowed to continue for a long time, the fetus dies because of anoxia caused by excessive pressure on the placenta and umbilical cord. The dead fetus becomes softened by decay and may trigger the onset of coagulation failure. This leads to maternal haemorrhage at delivery, shock and the risk of death.

*Summarize.*

*Ask if there are any questions.*

**Learning Aid 1-1** The "Talc Baby" (body)




**Learning Aid 1-2** The "Talc Baby" (head)

**Instructions for making the "Talc Baby" model**

1. Glue the sheet to cardboard, using bought or home-made glue. Allow to dry.
2. Carefully cut out the body, head and pelvis, following the heavy lines.
3. Cut out the central shaded part of the pelvis.
4. Colour the lines on the head as follows:

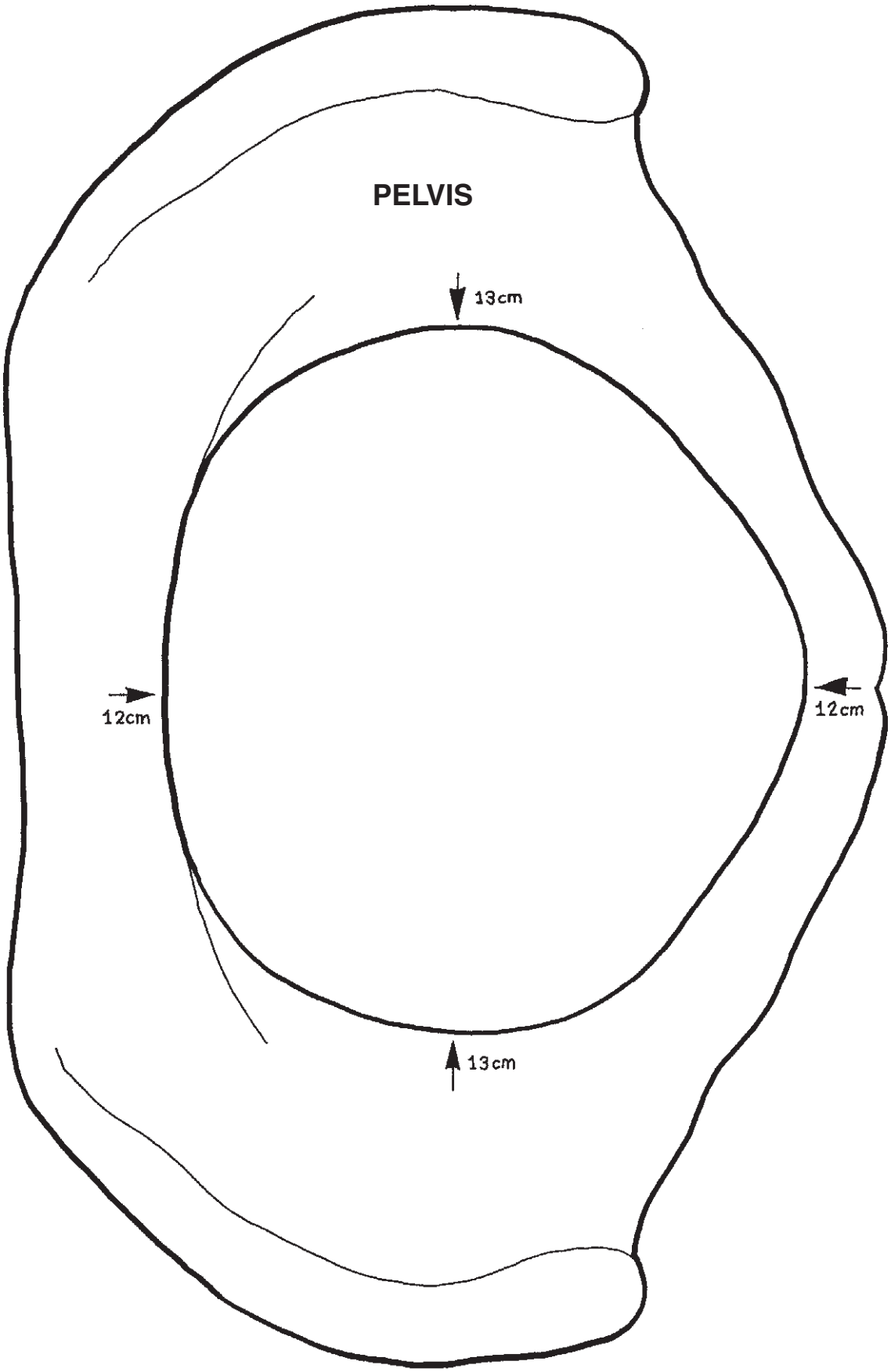
   ○○○ green

   □□□ blue

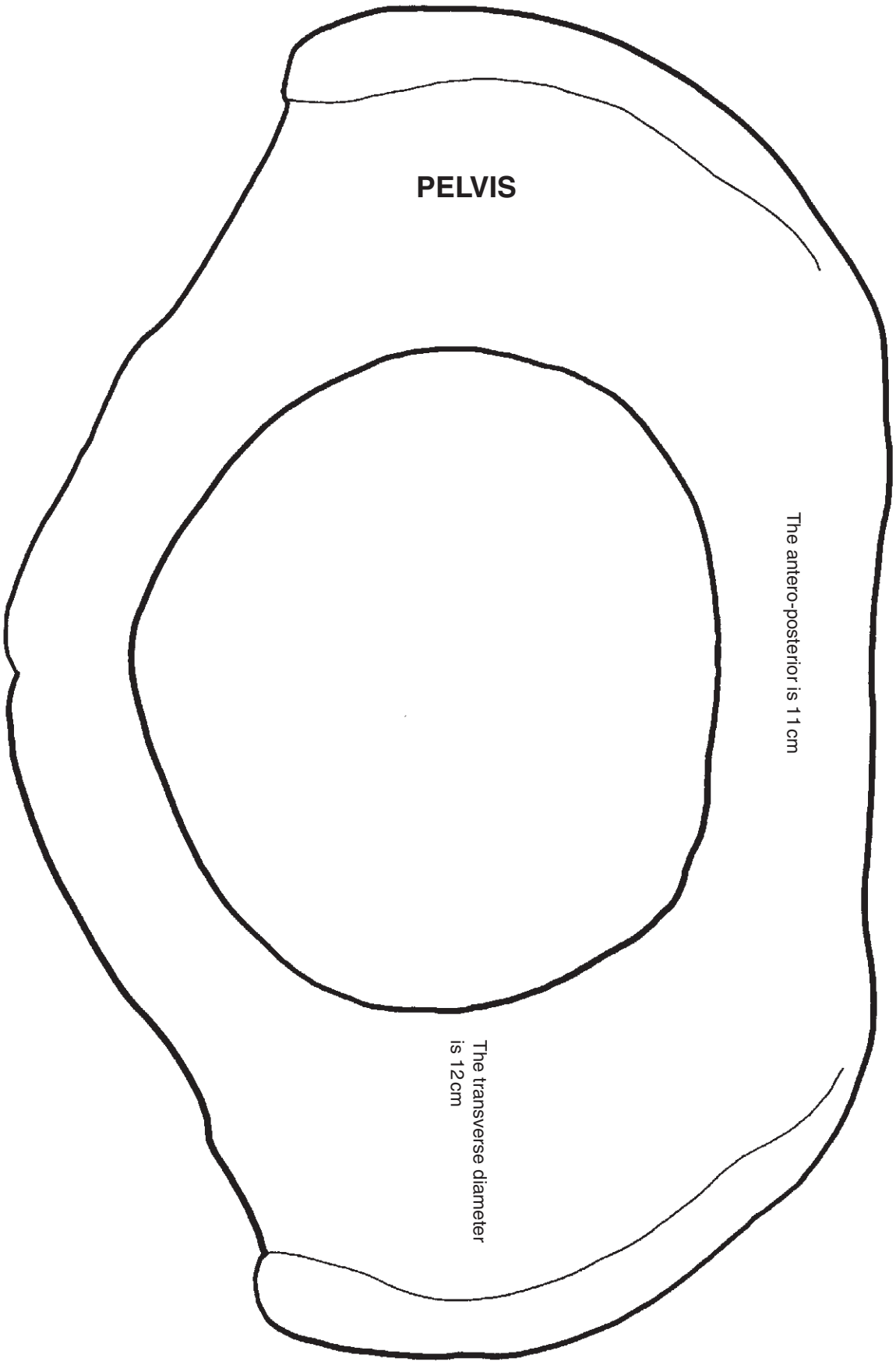
   △△△ red

   ○○○ orange

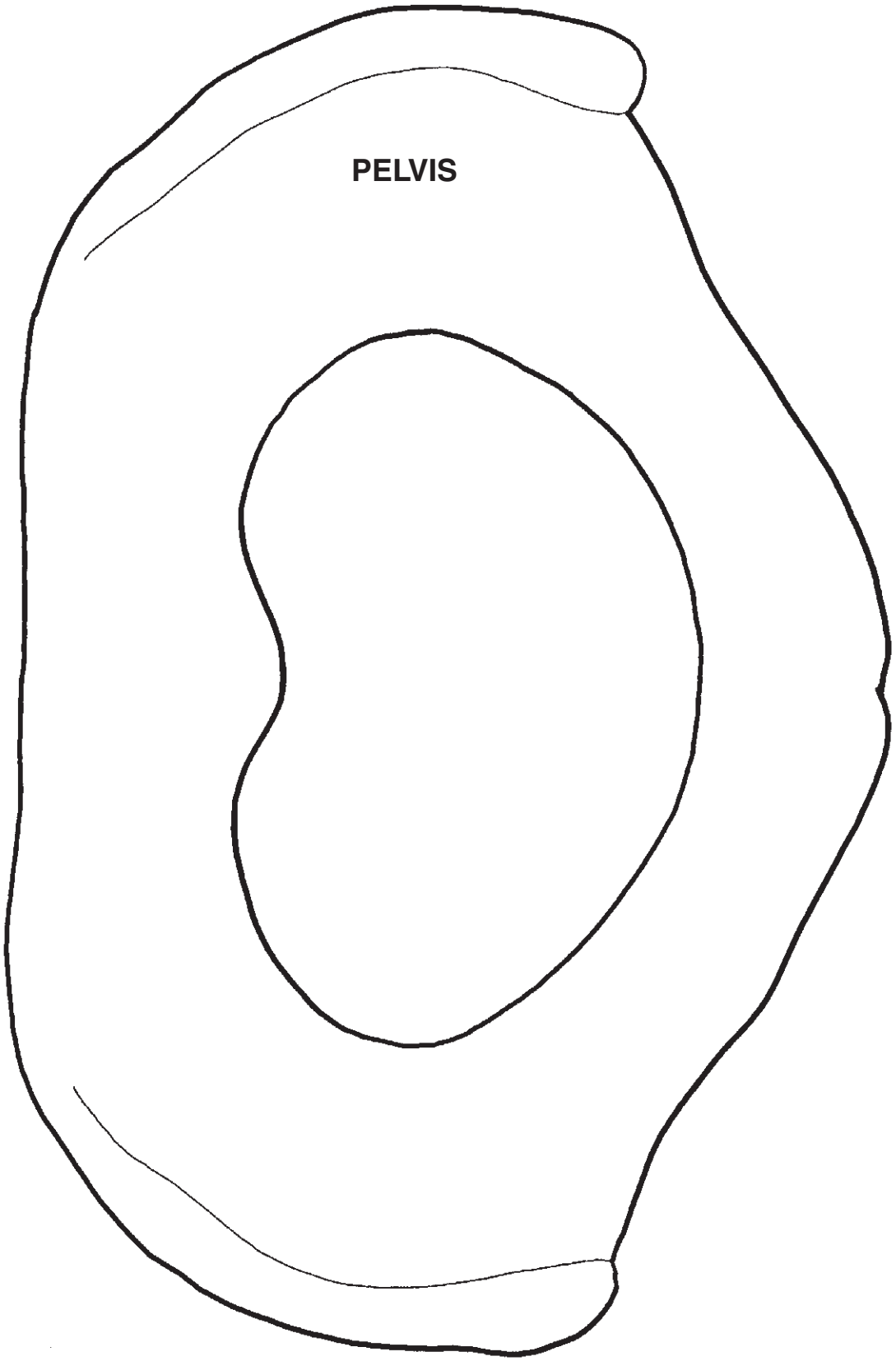
5. Attach the head to the body by putting a paper fastener through spot A on the body, and then spot A on the head. Flatten it out to be secure. You may now rotate the head on the body. (If you do not have a fastener, use two buttons by sewing them on either side of the head and body through the A spots).



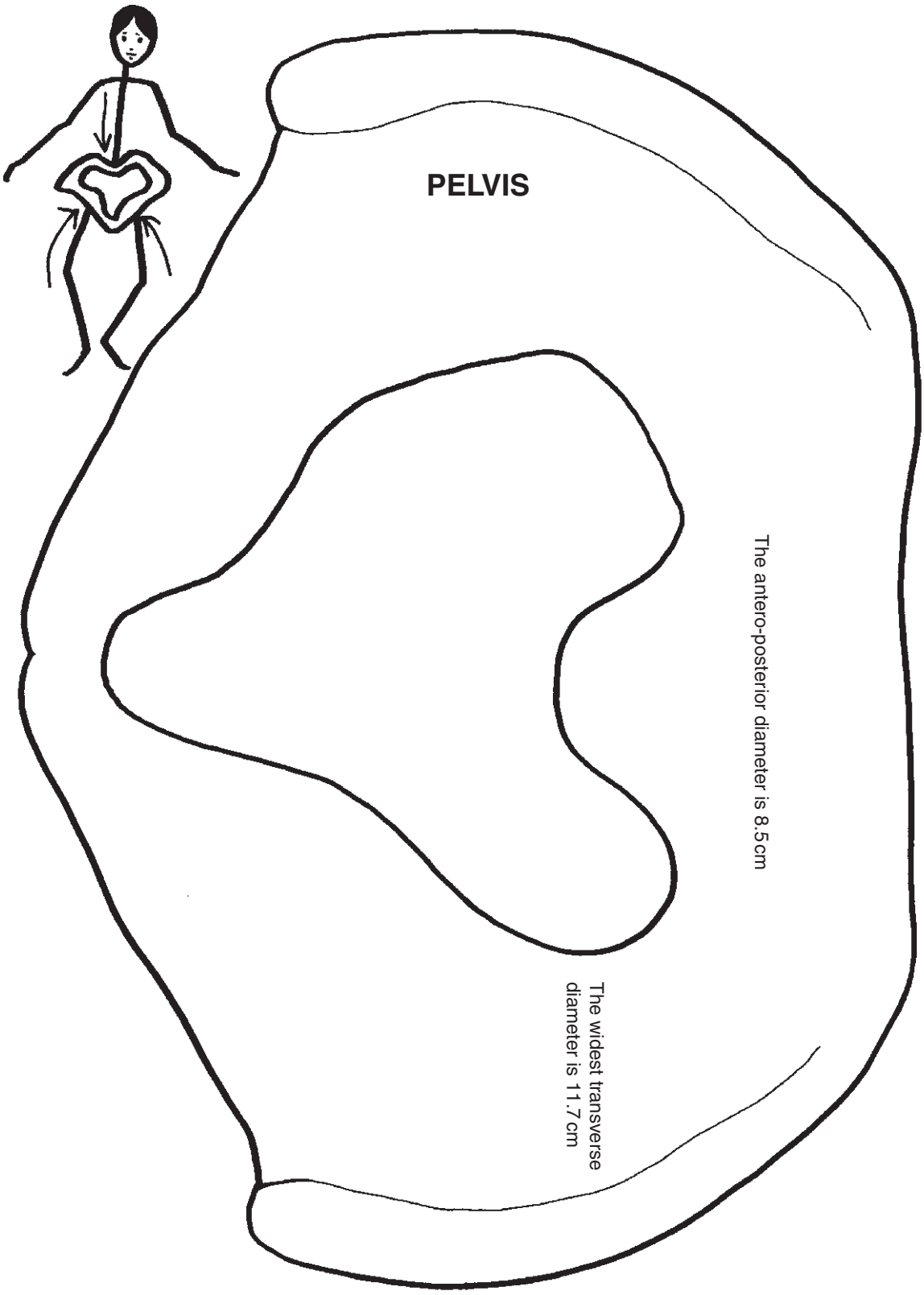

**Learning Aid 1-3** The normal female pelvis



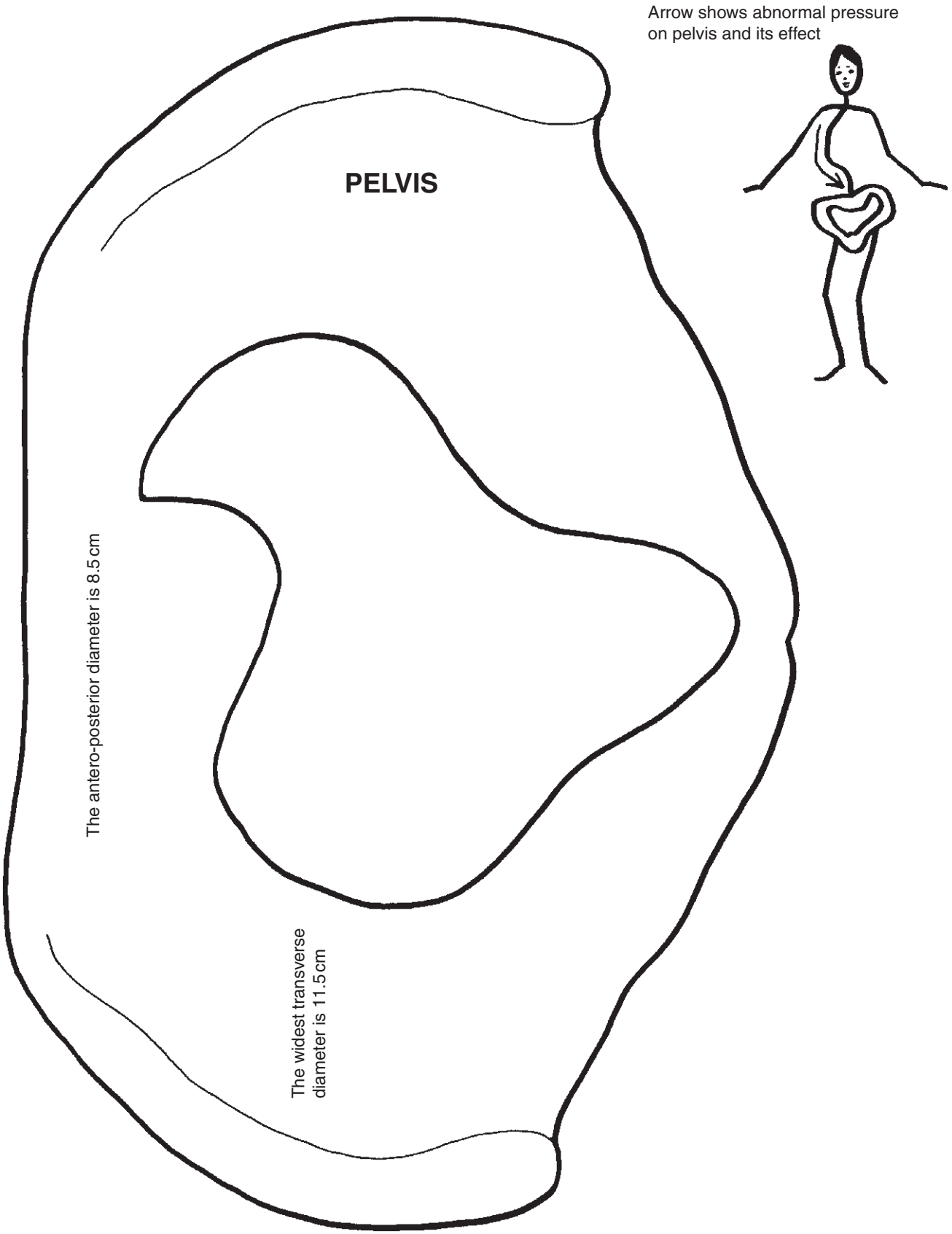

**Learning Aid 2** The small female pelvis (the shape is normal but the size is small)




**Learning Aid 3** The pelvis affected by rickets (kidney-shaped)




**Learning Aid 4** The pelvis affected by osteomalacia (y-shaped)




**Learning Aid 5** The pelvis affected by injury or disease which results in kyphosis or scoliosis of the spine

# 2 AVOIDABLE FACTORS

# SESSION 2
# AVOIDABLE FACTORS

**Aims**

- To enable students to understand that most maternal deaths are preventable.
- To establish ways of avoiding death from obstructed labour.

**Objectives**

On completion of Session 2, students will be able to:

- Define avoidable factors, risk factors, direct obstetric death, and indirect obstetric death.
- List the causes of, and risk factors for, obstructed labour and identify the avoidable factors.
- Discuss the steps to be taken in order to prevent death from the avoidable factors identified.

**Plan**

Modified lecture (½ hour).
Group work (1 hour).
Feedback and discussion (1½ hours).

**Resources**

Instructions for Group Work.
Worksheet.

## INTRODUCTION

*If you have already introduced students to the definitions of avoidable factors, risk factors, direct obstetric death, and indirect obstetric death in one of the other technical modules, review these definitions now and then proceed with the remainder of the session.*

## DEFINITIONS

*Ensure that students understand the following definitions:*

**Avoidable factors:** are factors causing or contributing to maternal death where there is departure from generally accepted standards of care.

**Risk factors:** are factors which make a condition more likely to happen or more dangerous.

It is important that students understand the following:

"Risk factors" should not be used to predict complications. The system of risk categorization, or the "risk approach", previously used for selecting women for specialized management is not useful, because evidence shows that many women categorized as "high risk" do not actually experience a complication, while many women categorized as "low risk" do. All pregnant women should therefore be considered "at risk" of developing a complication.

**Direct obstetric death:** is a death resulting from obstetric complications of the pregnant state (pregnancy, labour and puerperium), from interventions, omissions, incorrect management, or from a chain of events resulting from any of the above.

**Indirect obstetric death:** is a death resulting from previous existing disease or disease which developed during pregnancy, not due to direct obstetric causes, but which was aggravated or made worse by the physiological effects of pregnancy.

*Ask for examples of avoidable factors and discuss them, confirming that they are indeed avoidable. For instance:*

- *a woman is living a long distance away from a hospital. (This could have been avoided if there were some arrangements for her to stay closer to the hospital, e.g. in a maternity waiting home).*

*In order to prevent maternal death, it is necessary to look at both cause of death, and the risk factors:*

- *obstructed labour can be a cause of death, but distance from skilled help is a risk factor because it makes the danger of dying from obstructed labour greater.*

## GROUP WORK

*Divide the students into groups and give them the Instructions for Group Work and Worksheet, found at the end of this session. Explain what they have to do by working through the instructions provided.*

### Feedback

*After the group work, facilitate feedback by allowing each group to report back in detail. Use the checklist provided as a guide to the factors which should be mentioned.*

*Identify the avoidable factors and discuss the steps to avoid occurrence which the group has suggested.*

*Help the students to see that deaths from obstructed labour are avoidable and must be prevented.*

*Discuss the practical issues that students can address and what action they need to take.*

*Discuss the importance of identifying women who are at risk of obstructed labour (e.g. women with short height, rickets, a previous caesarean or stillbirth) so that they can be referred in good time to the hospital or to a maternity waiting home, where they can be assessed and provided with assistance, if required.*

*Discuss customs of early marriage and female genital mutilation if applicable to your country. Assess ways of influencing these by discussions with families, older women, TBAs, community leaders and mothers-in-law.*

*Help the students realize that neglect of daughters' nutritional needs because of son preference affects women's physical development and thus increases the risk of obstructed labour and death for both her and her baby.*

*Discuss the custom of veiling of women (purdah) if applicable to your country. Consider how this can result in rickets and osteomalacia and a small pelvis due to the lack of exposure to sunlight (vitamin D, which is needed for proper bone growth, is made by the skin when exposed to sunlight). Discuss possible ways of preventing these, whilst still conforming to purdah rules and obligations.*

*Stress the important role of the midwife in counselling pregnant women and their families, TBAs and community leaders about the danger of prolonged labour and the necessity of referral to a health facility after no longer than 12 hours in labour.*

*Finally, stress the essential role of the partograph in detecting prolonged/obstructed labour and the need for speedy referral to prevent death from obstructed labour.*

*Ask if there are any questions.*

*Summarize, emphasizing the importance of prevention.*

## INSTRUCTIONS FOR GROUP WORK

(Please read **all** the instructions carefully before you begin)

1. Define obstructed labour.
2. List the causes of obstructed labour.
3. List the risk factors for obstructed labour. (Risk factors are factors which make the chance of obstructed labour more likely or more dangerous).
4. Explain why each factor makes obstructed labour more likely.
5. Mark those risk factors which are avoidable (or can be prevented).

You are given an example. Work through it in the same way, using the Worksheet provided.

You have **one** hour in your group.

If required, use additional paper.

Appoint a group leader and a person to report back.

**Example:**

| Causes | Risk factors | Avoidable? | Steps to avoid occurrence |
|---|---|---|---|
| Cephalopelvic disproportion | Woman living long distance from hospital | Yes | Early identification of risk and referral to hospital and maternity waiting home. |

**WORKSHEET** 

| PREVENTING OBSTRUCTED LABOUR | | | |
|---|---|---|---|
| **Causes** | **Risk factors** | **Avoidable?** | **Steps to avoid occurrence** |
| | | | |

## CHECKLIST FOR OBSTRUCTED LABOUR ✓

*Use this checklist during feedback to guide the discussion and check that all points have been covered.*

### Causes

- Cephalopelvic disproportion: small or contracted pelvis or large fetus
- Abnormal presentations (e.g. brow, shoulder associated with transverse lie)
- Malposition of the fetus which in a minority of cases may lead to deep transverse arrest in the second stage of labour
- Fetal abnormalities, e.g. hydrocephalus, encephalocele, locked twins
- Abnormalities of the reproductive tract e.g. pelvic tumour, stenosis of cervix or vagina, tight perineum.

### Risk factors

These include:

- malnutrition or lack of exposure to sunlight due to overclothing, resulting in rickets or osteomalacia
- short height (<150 cm) of mother (often associated with malnutrition)
- previous caesarean or stillbirth, previous prolonged labour
- young age of mother (under 17 years of age)
- female genital mutilation
- long distance involved in obtaining skilled help
- lack of transport and communication
- traditional beliefs and practices regarding prolonged/obstructed labour
- custom of early marriage
- community distrust of health care personnel
- staff untrained to recognize obstructed labour (partograph not used)
- failure to act on risk factors
- delay in referral to higher level of care (e.g. for caesarean section).

All these factors are preventable, either:

- in the long term (e.g. correcting attitudes to diet, general health, clothing, status of women and life-style, care of girls and women, addressing problems of communications and transport, maternity waiting homes)
- in the short term (recognition and referral of high risk).

# 3 IDENTIFYING THE PROBLEM

# SESSION 3
# IDENTIFYING THE PROBLEM

**Aims**

- To enable students to understand the importance of identifying and defining the problem of obstructed labour in order to provide effective management.
- To enable students to acquire the art of diagnosis and differential diagnosis in respect of obstructed labour.

**Objectives**

On completion of Session 3, students will be able to:

- List the steps involved in providing effective management.
- List the causes of unsatisfactory progress in labour.
- Describe the clinical picture of a woman with obstructed labour.
- Describe the symptoms and signs of ruptured uterus.

**Plan**

Modified lecture, discussion (2 hours).
Clinical teaching (several days).
Optional quiz.

**Resources**

Managing complications in pregnancy and childbirth: a guide for midwives and doctors. Geneva, World Health Organization, 2003 (WHO/RHR/00.7).

## INTRODUCTION

*Explain that there are **six** steps to providing effective management.*

1. *Identify the problem.*

2. *Decide on the aim of management.*

3. *Select the best management.*

4. *Provide management, determining priorities.*

5. *Evaluate the outcome.*

6. *Provide further management if necessary. This may include referral.*

*This session is about step 1. Identifying the problem involves making an accurate diagnosis. This in turn often includes making a differential diagnosis (i.e. deciding which of two or more conditions may be the cause of the signs and symptoms noted).*

*It may be helpful to think of making a diagnosis as a kind of "detective work".*

*The students should form small discussion groups to decide how this is done.*

*Ask students:*

- *how does a detective make a decision about a crime?*
- *what does a detective do?*

*Answers should include, that a detective:*

- *looks for clues*
- *makes careful observations*
- *uses all the senses (e.g. sight, hearing, smell, touch)*
- *asks questions*
- *takes all circumstances into account.*

*Relate this to discussion about diagnostic skills.*

*Remind students that, in a similar way to a detective, we have to solve problems. The decisions we make are very important.*

*Students must use all their senses and powers of observation to:*

- *look*
- *listen*
- *touch*
- *think carefully and ask the question: What is the problem?*
- *consider all available information.*

*A detective does not come to a conclusion from one clue, but takes them all into consideration. Students must learn to do the same.*

## THE CLINICAL PICTURE

*In identifying the problems of prolonged and obstructed labour, it is essential to consider the history, the physical examination and the partograph.*

*Explain the typical findings to the students in the classroom using Table 1. Then take the students into the clinical area.*

*Recall significant points in the history of the woman.*

*Demonstrate abdominal examination, making sure that students can interpret their findings.*

*Explain how students should report their findings on vaginal examination, as the situation arises.*

*Examination of women who experience prolonged or obstructed labour will, of course, have to be undertaken in the clinical situation when these complications arise. This may take some time, as it is hoped that there will not be too many women with these problems. Ask students to share their experience of this condition in practice as you explain and discuss the diagnostic points.*

### History

Relevant points to find out from the woman, her family or the health care worker are:

- her age
- height, gait, and any disability affecting the pelvis or lower limbs
- medical history, in particular rickets, osteomalacia, or pelvic injury
- whether this is her first pregnancy and/or labour commenced at term
- reasons for any previous operative deliveries
- previous stillbirth or early neonatal death and cause, if known
- any complications during pregnancy

- length of time in labour so far
- if partograph has been used, does cervical dilatation cross the alert or action lines
- pattern of uterine action so far, e.g. contractions increased in frequency and duration, or stopped etc.
- if membranes have ruptured
- if membranes have ruptured, how long ago did they rupture and is there any meconium-staining or foul smell?

**Table 1: Diagnosis of unsatisfactory progress of labour**

| Findings | Diagnosis |
|---|---|
| Cervix not dilated<br>No palpable contractions/infrequent contractions | False labour |
| Cervix not dilated beyond 4 cm after 8 hours of regular contractions | Prolonged latent phase |
| Cervical dilatation to the right of the alert line on the partograph: | Prolonged active phase |
| ▪ Secondary arrest of cervical dilatation and descent of presenting part in presence of good contractions. | Cephalopelvic disproportion |
| ▪ Secondary arrest of cervical dilatation and descent of presenting part with large caput, third degree moulding, cervix poorly applied to presenting part, oedematous cervix, ballooning of lower uterine segment, formation of retraction band, maternal and fetal distress. | Obstruction |
| ▪ Less than 3 contractions in 10 minutes, each lasting less than 40 seconds. | Inadequate uterine activity |
| ▪ Presentation other than vertex with occiput anterior. | Malpresentation or malposition |
| Cervix fully dilated and woman has urge to push, but there is no descent. | Prolonged expulsive phase |

## Diagnostic points of the physical examination

### General condition

In cases of obstructed labour there will be signs of physical and mental exhaustion.

Some or all of the following signs and symptoms may also be observed:

- maternal and/or fetal distress
- dehydration and ketoacidosis (sunken eyes, thirsty, dry mouth, dry skin identified by skin pinch going back slowly)
- fever (raised temperature)
- abdominal pain which may be continuous
- shock, rapid, weak pulse (100 per minute or more), diminished urinary output, cold clammy skin, pallor, low blood pressure (systolic less than 90 mmHg), rapid respiratory rate (30 per minute or more), anxiousness, confusion, or unconsciousness. Shock may be due to a ruptured uterus or sepsis.

### Abdominal examination

Signs of obstructed labour that may be revealed by an abdominal examination are:

- the widest diameter of the fetal head can be felt above the pelvic brim because it is unable to descend; a large caput succedaneum may be fixed in the pelvic brim and this can be misleading, but careful palpation should identify that the widest diameter of the head is still above the brim; if the uterus is tonic, it will be very difficult to palpate because it is continuously hard and very painful for the woman
- frequent, long and strong uterine contractions (although if a woman has been in labour for a long time, contractions may have stopped because of uterine exhaustion); they restart with renewed vigour
- the uterus may have gone into tonic contraction (i.e. it is continuously hard) and sits tightly moulded around the fetus
- Bandl's ring may be seen (**Figure 3.1**).
  - Bandl's ring is the name given to the area between the upper and lower uterine segments when it becomes visible and/or palpable during labour. In the process of normal pregnancy and labour, this area is called a retraction ring. It should not normally be seen or felt on abdominal examination
  - Bandl's ring is a late sign of obstructed labour. It can be seen as a depression across the abdomen at about the level of the umbilicus. Above this is the grossly thickened, retracted upper uterine segment. Below the Bandl's ring is the distended, dangerously thinned lower uterine segment. The lower abdomen can be further distended by a full bladder and gas in the intestines.
- Fetal heart may not be heard in severe cases of obstructed labour because the fetus dies from anoxia.

### Vaginal examination

The signs of obstruction that must be looked for are as follows:

- foul-smelling meconium draining
- amniotic fluid already drained away
- catheterization will produce concentrated urine which may contain meconium or blood
- vaginal examination
  - oedema of the vulva, especially if the woman has been pushing for a long time
  - vagina hot and dry because of dehydration
  - oedema of the cervix
  - incomplete dilatation of the cervix (may be fully dilated in case of outlet obstruction)
  - a large caput succedaneum can be felt
  - the cause of the obstruction, e.g.excessively moulded head stuck in pelvis, shoulder, brow or posterior face presentation, prolapsed arm.

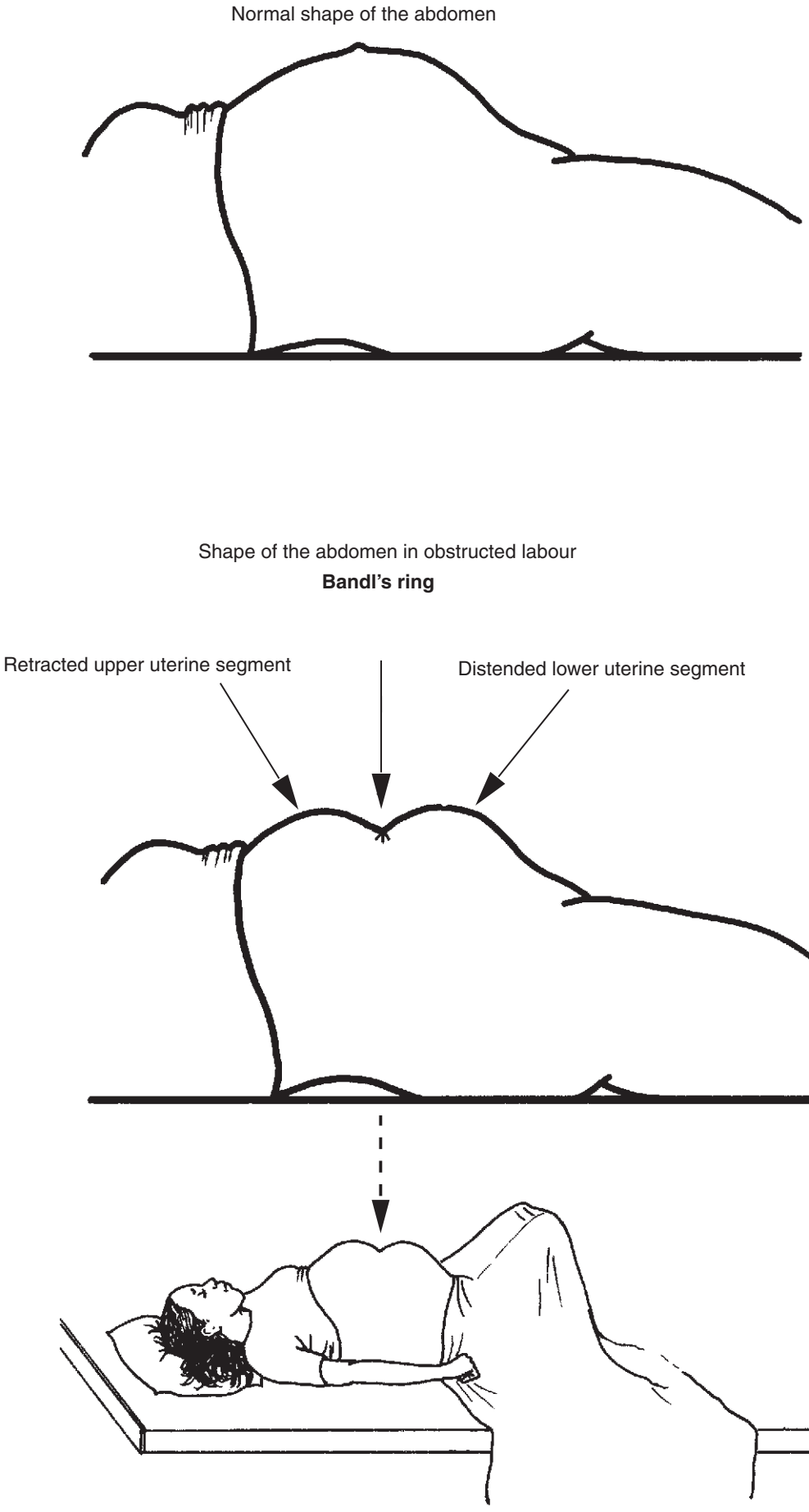



**Figure 3.1:** Diagnosing obstructed labour

### Partograph recordings

Obstructed labour may also be revealed if the recordings on the partograph indicate:

- a prolonged first or second stage of labour which is evident because cervical dilatation will cross first the alert line and then, if no action is taken, will cross the action line despite a history of strong uterine contractions.

### Symptoms and signs of ruptured uterus

Students must be able to recognize ruptured uterus (refer back to Session 1 for definition and cause of ruptured uterus in obstructed labour).

Ruptured uterus is common in multiparas but rare in nulliparas.

Warning signs: Bandl's ring and tenderness of the lower segment of the uterus.

Suspect rupture of the uterus if the following signs and symptoms are present:

- shock
- abdominal distension/free fluid
- abnormal uterine contour
- tender abdomen
- easily palpable fetal parts
- absent fetal movements and fetal heart sounds
- rapid maternal pulse.

Diagnosis could be more difficult if rupture is incomplete or the tear is small. In this case, the fetus will remain at least partially in the uterus and signs of shock in the mother are delayed until after delivery because the pressure of the fetus prevents bleeding to some extent. Symptoms in this case could be initially very slight, and labour may even continue. Suspect rupture if the fetus suddenly becomes distressed and the mother's pulse starts rising.

*Check if there are any questions.*

*Summarize.*

*You may wish to test the students' knowledge and understanding so far by making up a quiz. Include information contained in the first three sessions. An example of a quiz is provided in Session 1 of the postpartum haemorrhage module.*

# 4 PREVENTING PROLONGED AND OBSTRUCTED LABOUR

# SESSION 4
# PREVENTING PROLONGED AND OBSTRUCTED LABOUR

**Aims**

- To enable students to understand the concept and principles of using the partograph in the prevention of prolonged and obstructed labour.
- To apply this understanding in practice and to become increasingly skilled in assessing the progress of labour.

**Objectives**

On completion of Session 4, students will be able to:

- Explain the principles of the partograph as a tool for prevention of prolonged and obstructed labour.
- Explain the difference between the latent and active phases of labour.
- Record clinical observations accurately on the partograph.
- Interpret accurately the observations recorded on the partograph.

**Plan**

Modified lecture, practical exercises (8 hours).

Clinical teaching, assessment (several days).

(If students have not been introduced to the partograph and are inexperienced in examination during labour, additional time may be required for the lecture, exercises and clinical teaching).

**Resources**

Much of the information in this session has been adapted from "How to use a partograph when monitoring labour progress" from *Life-saving skills manual for midwives*. 2nd ed. American College of Nurse-Midwives, Washington, DC., 1991.

Exercise 4.1, Using the partograph is taken from the *Emergency obstetric care for doctors and midwives. Course notebook for trainers*. Averting Maternal Death and Disability (AMDD) Program, Columbia University, Mailman School of Public Health, and JHPIEGO/Maternal and Neonatal Health Program, Baltimore, Maryland, 2002.

*Preventing prolonged labour: a practical guide. The partograph, part I: principles and strategy.* Geneva, World Health Organization, 1994 (WHO/FHE/MSM/93.8).

*Preventing prolonged labour: a practical guide. The partograph, part II: user's manual.* Geneva, World Health Organization, 1994 (WHO/FHE/MSM/93.9).

*Preventing prolonged labour: a practical guide. The partograph, part III: facilitator's guide.* Geneva, World Health Organization, 1994 (WHO/FHE/MSM/93.10).

*Managing complications in pregnancy and childbirth: a guide for midwives and doctors.* Geneva, World Health Organization, 2003 (WHO/RHR/00.7).

## INTRODUCTION

*Remind students that obstructed labour is a major cause of maternal death. Refer to any recent cases in your area of practice.*

*Make sure that students are familiar with the purpose of the partograph and that they know how to record, interpret and monitor the progress of labour using the partograph. In order to achieve this, work through the session, including Exercise 4.1 on page 67, which provides an opportunity for students to practise using the partograph. Alternatively, you can work through the session using the partograph (**Figure 4.1**) and complete the remaining case studies as an end of session test of the students' understanding.*

## INTRODUCING THE PARTOGRAPH*

The partograph is a record of all of the observations made on a woman in labour, the central feature of which is the graphic recording of the dilatation of the cervix as assessed by vaginal examination.

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

**Personal information**

Information including name, gravida, para, registration/hospital number, date of admission, time of admission, time of ruptured membranes is written at the top of the graph.

**Fetal heart rate**

This is recorded half-hourly to monitor the condition of the fetus.

**Liquor**

Amniotic fluid is observed and recorded at each vaginal examination as follows: clear ("C"), blood-stained ("B") or meconium-stained ("M"). If the membranes are not ruptured, record "I" for intact.

**Moulding**

This is recorded as follows: bones are separated and the sutures can be felt easily (o); bones are just touching each other (+); bones are overlapping (++); bones are overlapping severely (+++).

* Note that the WHO revised partograph, which excludes the latent phase of labour, as shown in *Managing complications in pregnancy and childbirth: a guide for midwives and doctors* (WHO/RHR/00.7), is included in this session. If, however, you choose to use the earlier version of the WHO partograph, which includes the latent phase of labour, please follow the exercises in *The partograph, part III: facilitator's guide* (see Resources).

| | |
|---|---|
| **Cervical dilatation** | This is the most important observation to monitor progress of labour. Cervical dilatation is assessed at every vaginal examination and marked with a cross (X). Plotting begins on the partograph at 4 cm. |
| **Alert line** | The alert line starts at 4 cm of cervical dilatation to the point of expected full dilatation at the rate of 1 cm per hour. |
| **Action line** | The action line is parallel, and 4 hours to the right of the alert line. |
| **Descent of the head** | Descent assessed by abdominal palpation refers to the part of the head (divided into 5 parts) palpable above the symphysis pubis. The descent is recorded as a circle (O) at every vaginal examination. |
| **Hours** | Refers to the time elapsed since the onset of the active phase of labour. |
| **Time** | The actual time of day is recorded here. |
| **Contractions** | Contractions are recorded every 30 minutes; palpate the number of contractions in 10 minutes and their duration in seconds. |
| **Oxytocin, drugs and intravenous fluids** | These are recorded in the space provided. |
| **Blood pressure, pulse and temperature** | Record pulse every 30 minutes, blood pressure every 4 hours and temperature every 2 hours. |
| **Urine** | The amount is recorded every time urine is passed. The woman is encouraged to pass urine every 2 hours in labour and each specimen is tested for protein and ketones. |

# PARTOGRAPH

Name Gravida Para Hospital no.

Date of admission Time of admission Ruptured membranes hours

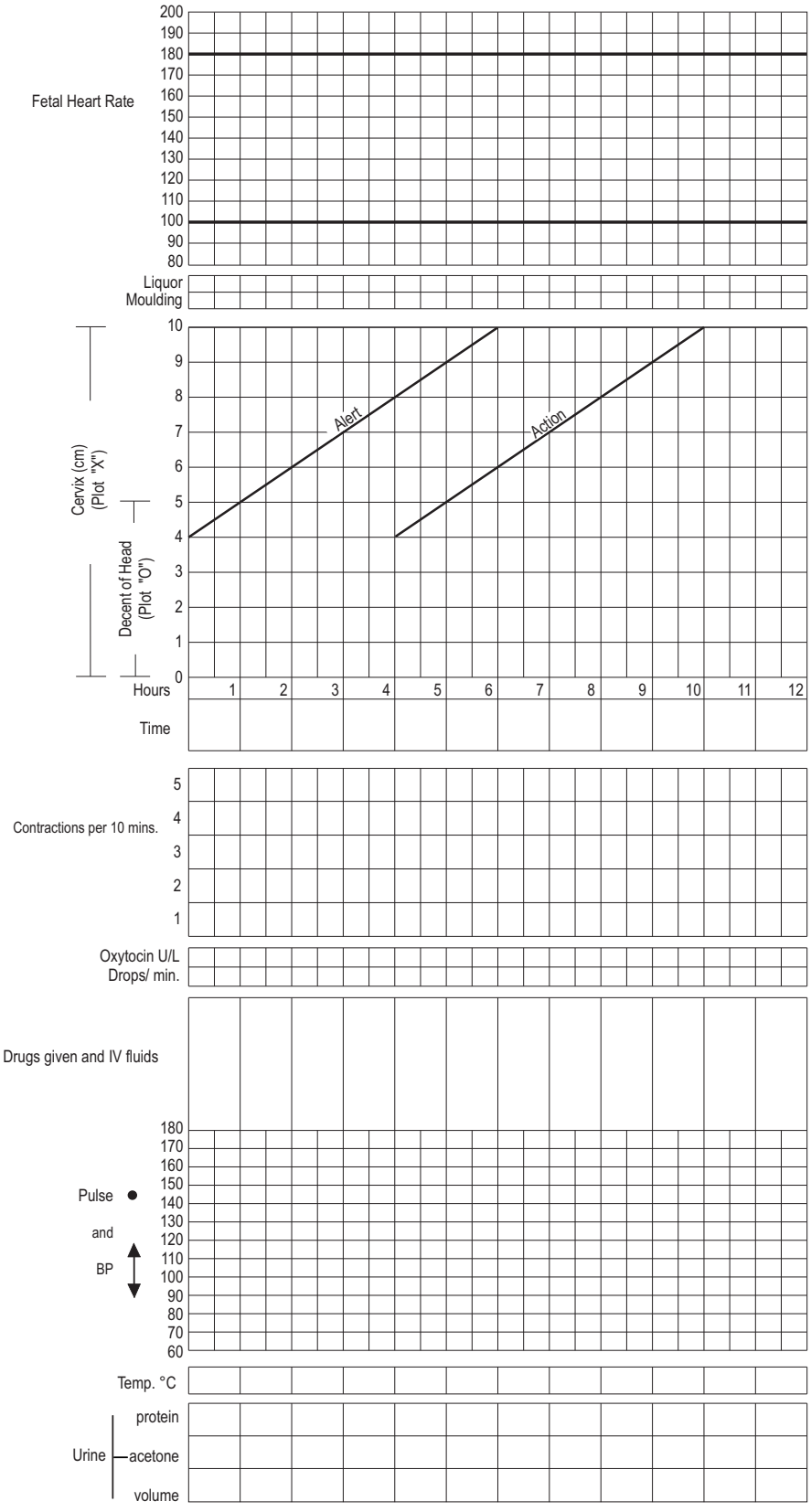



**Figure 4.1** Partograph

## USING THE PARTOGRAPH

When a woman is admitted in labour an evaluation of her general condition and the condition of the fetus is carried out. This includes a history (if not available on the woman's record), abdominal examination, fetal heart rate, and vaginal examination.

*The following information will help students to learn how to record, observe and interpret their findings using the partograph. Before continuing, provide each student with a blank partograph form to enable them to follow the explanation you provide for each part of the form.*

### Progress of labour

#### Cervical dilatation

The first stage of labour is divided into the latent and active phases.

The latent phase at the onset of labour lasts until cervical dilatation is 4 cm and is accompanied by effacement of the cervix. The latent phase may last up to 8 hours, although it is usually completed more quickly than this. Although regular assessments of maternal and fetal well-being and a record of all findings should be made, these are not plotted on the partograph (using modified version) until labour enters active phase.

The active phase of the first stage of labour starts when the cervix is 4 cm dilated and is completed at full dilatation, i.e. 10 cm. Progress in this phase is approximately 1 cm per hour and often quicker in multigravidae.

Along the left side of the partograph are the numbers 0–10. Each number/square represents 1 cm dilatation.

Along the bottom of the partograph are 24 squares. Each square represents 1 hour.

Dilatation of the cervix is recorded on the partograph with an X. Vaginal examinations are carried out approximately every 4 hours. Women, particularly multipara, may need to be checked more frequently in advanced labour. If progress is satisfactory, recording of cervical dilatation will remain on, or to the left, of the alert line.

If the membranes have ruptured and the woman has no contractions, do not perform a digital vaginal examination as it does not help to establish the diagnosis and there is a risk of introducing infection. Place a clean pad over the vagina and examine it an hour later visually and for the typical smell of amniotic fluid. If there are signs of infection, or the membranes have been ruptured for 18 hours or more, or the pregnancy is less than 37 weeks gestation with or without infection, give antibiotics. Then arrange for transfer of the woman to a higher level health facility with special neonatal care facilities.

**Points to remember:**

- The latent phase is from 0–4 cm dilatation and is accompanied by gradual shortening and thinning (effacement) of the cervix. It should normally not last longer than 8 hours.
- The active phase is from 4–10 cm dilatation which should be at the rate of at least 1 cm/hour.
- When labour progresses well, dilatation of the cervix should remain on or to the left of the alert line.
- When admission takes place in the active phase, cervical dilatation is recorded on the alert line.

## Descent of the fetal head

For labour to progress well, dilatation of the cervix should be accompanied by descent of the fetal head.

When plotting decent of the head, use a separate symbol to that used for cervical dilation (**Figure 4.2**)

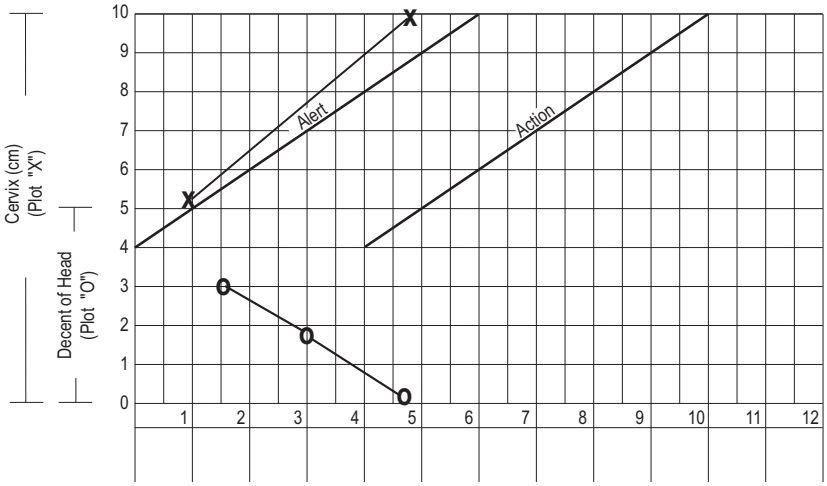
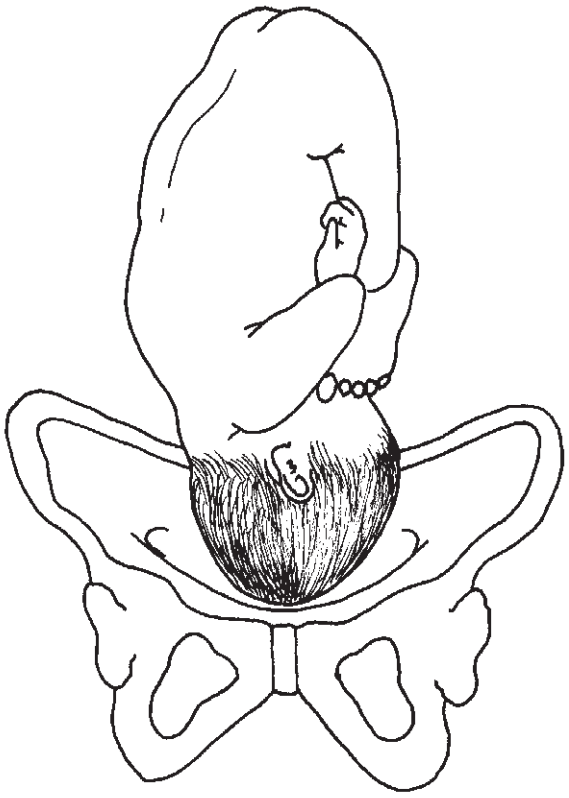



**Figure 4.2** Plotting descent of the head

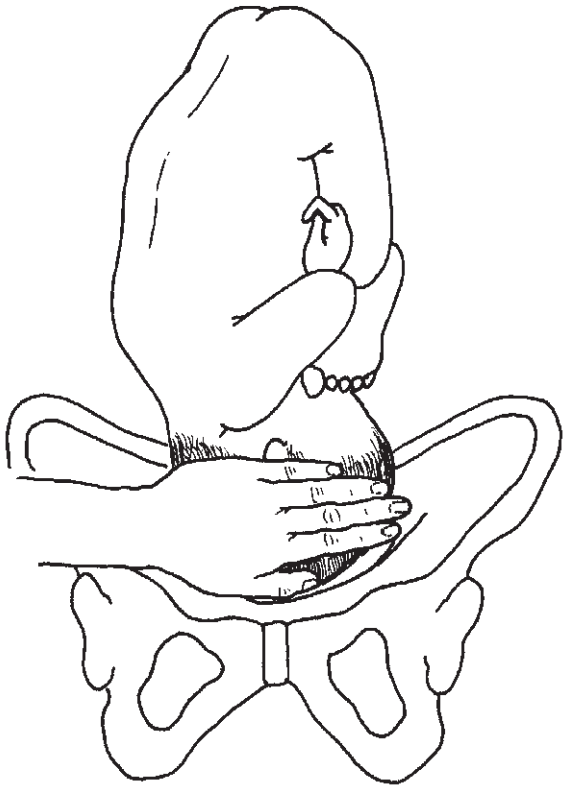
For convenience, the width of five fingers is a guide to the expression in fifths of the head above the brim. A head which is mobile above the brim will accommodate the full width of five fingers (closed) (**Figure 4.3** top).

As the head descends, the portion of the head remaining above the brim, will be represented by fewer fingers (4/5th, 3/5th etc.). It is generally accepted that the head is engaged when the portion above the brim is represented by 2 fingers' width or less (**Figure 4.3** bottom).

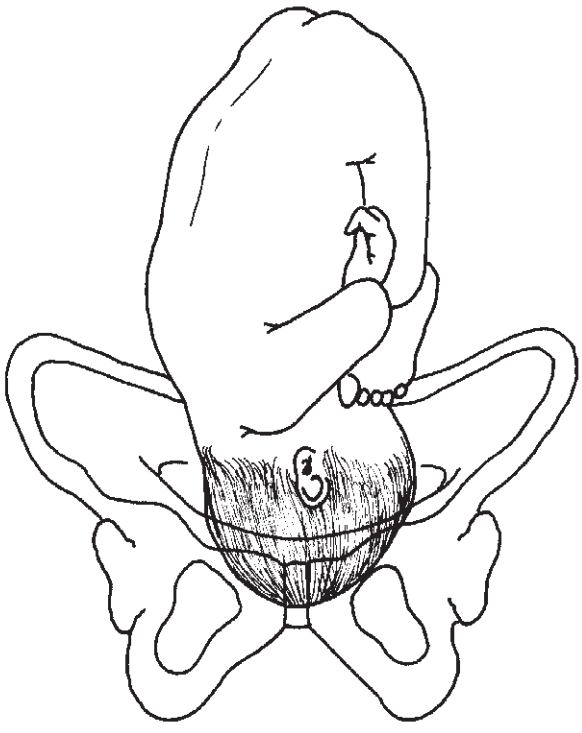
Descent of the head should always be assessed by abdominal examination immediately before doing a vaginal examination so that you will know where to expect to feel the head during the vaginal examination.



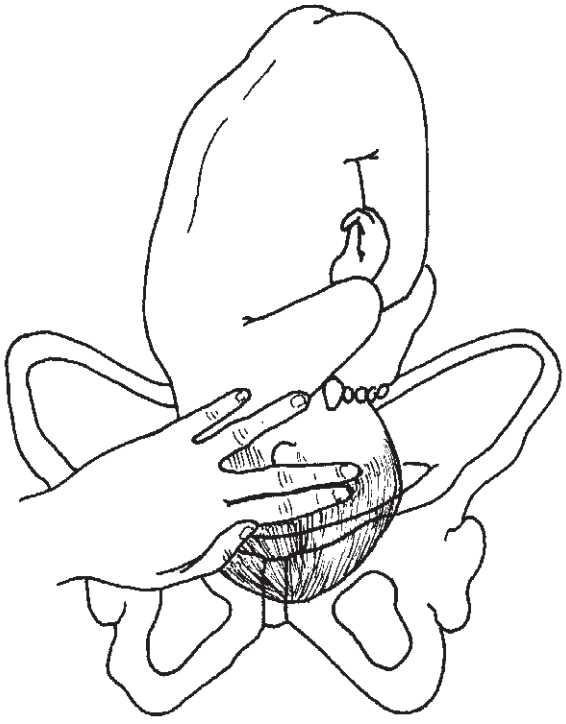
Head is mobile above brim = 5/5



Head accommodates full width of five fingers above the brim



Head is engaged = 2/5



Head accommodates two fingers above the brim

**Figure 4.3:** Descent of the head as assessed by abdominal examination

**Points to remember:**

- Measuring descent of the fetal head helps the midwife to follow progress of labour. Failure to descend may indicate obstructed labour.
- An abdominal examination must always be done before a vaginal examination.

## Uterine contractions

Good uterine contractions are necessary for progress of labour. Normally contractions become more frequent and last longer as labour progresses. Contractions are recorded every 30 minutes on the partograph.

Below the time line and at the left hand side is written "contractions per 10 minutes".

The squares in this section of the partograph are numbered from 1–5. Each square represents one contraction so that if 2 contractions are felt in 10 minutes, 2 squares will be shaded.

The squares below provide the key to recording the strength of contractions on the partograph.

 Dots represent mild contractions of less than 20 seconds' duration.

 Diagonal lines indicate moderate contractions of 20–40 seconds' duration.

 Solid colour represents strong contractions of longer than 40 seconds' duration.

**Points to remember:**

- Contractions are observed for frequency and duration and recorded on the partograph every 30 minutes.
- The number of contractions in 10 minutes is recorded.
- The 3 ways of recording the duration of contractions are less than 20 seconds, 20–40 seconds, more than 40 seconds.

## The fetal condition

Fetal heart rate, membranes, liquor (amniotic fluid) and moulding of the fetal skull bones give information about fetal condition during labour.

### Fetal heart rate

Listening to and recording the fetal heart rate is a safe and reliable way of monitoring how the fetus is doing.

The fetal heart rate is recorded at the top of the partograph. It is recorded every half hour in the first stage of labour, but more frequently at the end of the first stage and in the second stage. Each square for the fetal heart on the partograph represents 30 minutes. The lines for 100 and 180 beats per minute are darker to remind the midwife that a fetal heart rate less than 100 or more 180 is indicative of significant fetal distress.

### Membranes and liquor (amniotic fluid)

The state of the liquor or amniotic fluid can assist in assessing the fetal condition.

The following observations are recorded on the partograph immediately below the fetal heart rate recordings. The observations are made at each vaginal examination.

If the membranes are intact:

- record as the letter "I" for "intact".

If the membranes are ruptured:

- liquor is clear, record as the letter "C" for "clear"
- liquor is blood-stained, record as the letter "B"
- liquor is meconium-stained, record as the letter "M"
- liquor is absent, record as the letter "A" for "absent".

Listen to the fetal heart rate every five minutes if:

- liquor contains thick green or black meconium
- liquor is absent at the time membranes rupture.

**These may be signs of fetal distress (fetus is short of oxygen).**

### Moulding of the fetal skull bones

Moulding is an important indication of the pressure exerted on the head by the pelvis in labour, e.g. a large pelvis will exert little pressure on a small head, but a small pelvis will exert marked pressure on a large head. To record moulding use the following key:

0 bones are separated and the sutures can be felt easily.

\+ bones are just touching each other.

++ bones are overlapping but **can** be separated easily with pressure from your finger, which may mean the woman should be referred to a higher level of care.

+++ bones are overlapping but **cannot** be separated easily with pressure from your finger, which may mean the woman should be referred to a higher level of care.

**Points to remember:**

- Listen to the fetal heart rate immediately after the strongest part of a contraction.
- Recordings of the fetal heart rate are made every half hour in the first stage of normal labour.
- Normally the fetal heart rate is between 120–160 beats/minute.
- Increased moulding with a high head is a sign of disproportion (baby is too big for mother's pelvis).

## The maternal condition

All the observations for the mother's condition are written at the bottom of the partograph.

### Pulse, blood pressure and temperature

Take the pulse every half–hour.

### Urine

Ask the mother to pass urine every 2–4 hours. Look at the urine for amount and concentration. Each specimen should be tested for protein and ketones.

### Drugs and rehydration fluids

Chart these when you give them.

### Oxytocin

There is a separate column for oxytocin above the column for rehydration fluids and drugs.

All entries are made on the correct time line at which the observations are made.

## Unsatisfactory progress in labour

The midwife or doctor can use the partograph to identify complications in labour. When the labour is not normal, the midwife must arrange for the woman to be referred to a higher level of care where interventions such as caesarean section are available.

### Prolonged latent phase

If the woman remains in the latent phase of labour for more 8 hours, progress is not normal. In these cases the woman may be in "false labour" or a prolonged latent phase.

In the latent phase there is some change in cervical effacement and/or dilatation and contractions continue, whereas in false labour there is no change in the cervix and contractions cease. The diagnosis is usually made retrospectively, either when contractions cease in cases of false labour, or when cervical dilatation progresses beyond 4 cm and contractions continue. Any woman with a latent phase of 8 hours must be referred.

In a prolonged latent phase, cervical dilatation will remain between 1 cm and 4 cm. If using the partograph with the latent phase, cervical dilatation when plotted will cross to the right of the alert line after 8 hours and then the woman should be referred.

### Moving to the right of the alert line active phase

In the active phase of labour, plotting of the cervical dilatation will normally remain on, or to the left of the alert line. When dilatation crosses to the right of the alert line, this is a warning that labour may be prolonged.

When the dilatation moves to the right of the alert line, a full assessment of the mother, fetus and progress in labour must be made. Sometimes rehydration, emptying the bladder and encouraging the woman to be more active and move around or adopt an upright position will speed up the progress of labour and normal progress will continue. However, if there is any other complication (e.g. hypertension, fetal distress, failure of the head to descend, etc.), the mother must be referred immediately for expert help, unless the birth is imminent. The woman and her family should be informed of all findings and that referral for higher level assessment may become necessary. If this requires transfer to another facility, arrangements for transportation should be made. This is particularly important if higher level care is not accessible nearby.

### At the action line

The action line is 4 hours to the right of the alert line. When cervical dilatation crosses this line, action must be taken immediately. Unless the birth is imminent, the woman should be referred immediately for expert assessment and appropriate action.

**Points to remember:**

- All women whose cervical dilation moves to the right of the alert line must be assessed, and a decision made about the action to be taken. If there are additional complications, rehydration, emptying the bladder and adopting an upright position may be instituted and the woman reassessed in 2–4 hours.
- At the action line, the woman must be referred without delay to a higher level health facility. If this requires transfer of the woman, the midwife must accompany the woman on the journey.

## LEARNING AID - CERVICAL DILATATION

The dilatation of the cervical os is measured in centimetres (cm), fingers, percentages and inches. This module refers to cm. If you use another method of measuring, change the cm to your method using the following information:

| | | | | |
|---|---|---|---|---|
| 1 finger | = | ½ inch or 1.25 cm | | |
| 2 fingers | = | 1¼ inches or 3 cm | | |
| 3 fingers | = | 1¾ inches or 4.5 cm | | |
| 4 fingers | = | 2¼ inches or 5.5 cm | | |
| 5 fingers | = | 50% dilatation | = | 2¾ inches or 7 cm |
| 6 fingers | = | 75% dilatation | = | 3½ inches or 8.5 cm |
| 7 fingers | = | 95% dilatation or rim | = | 3¾ inches or 9.5 cm |

Once 50% dilatation has been reached, the experienced midwife may think about the amount of cervix remaining during the vaginal examination. For instance when the dilatation is 75%, the midwife feels only a circle of cervix about the width of a finger remaining. When the dilatation is 95%, the midwife feels only a very thin rim of cervix. She/he knows that the cervix will soon slip over the fetal head and the second stage will soon begin.

*You can help the students learn how to assess cervical dilation by making a visual aid of circles of different cms (**Figure 4.4**). The visual aid ideally should allow the students to place their fingers inside the circles. Have the students make an assessment of the different circles with their eyes closed.*

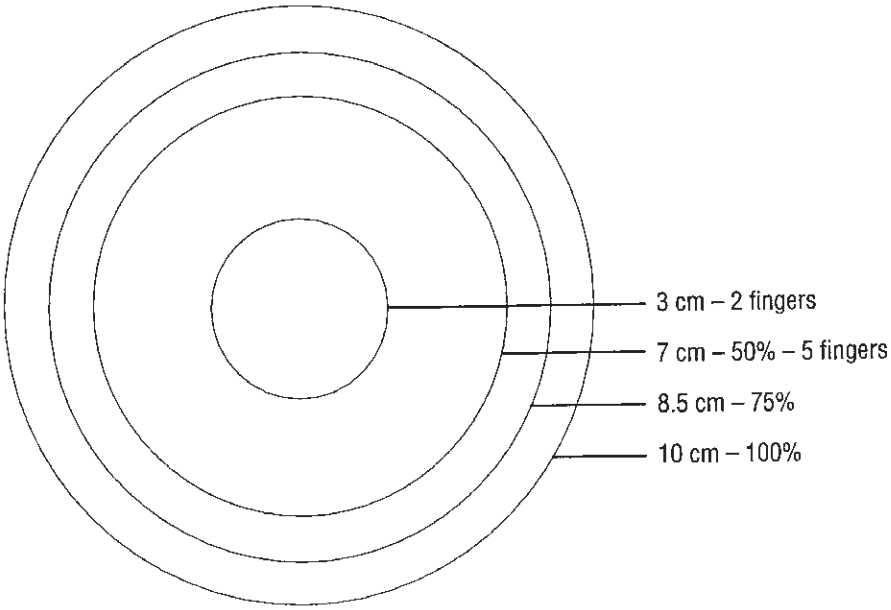



**Figure 4.4:** Measurement of cervical dilatation

*Summarize.*

*Allow time for checking that all students have understood **what** should be recorded **where** on the partograph, and **how** these should be recorded.*

*Finally, complete Exercise 4.1 either in small groups, allowing time for discussion, or individually as a post-session question. However, if you elect to use the case studies as an individual exercise, it may be helpful to first work through Case study 1 as a group. Students should then have a better understanding of what is expected of them.*

### Exercise 4.1 Using the partograph

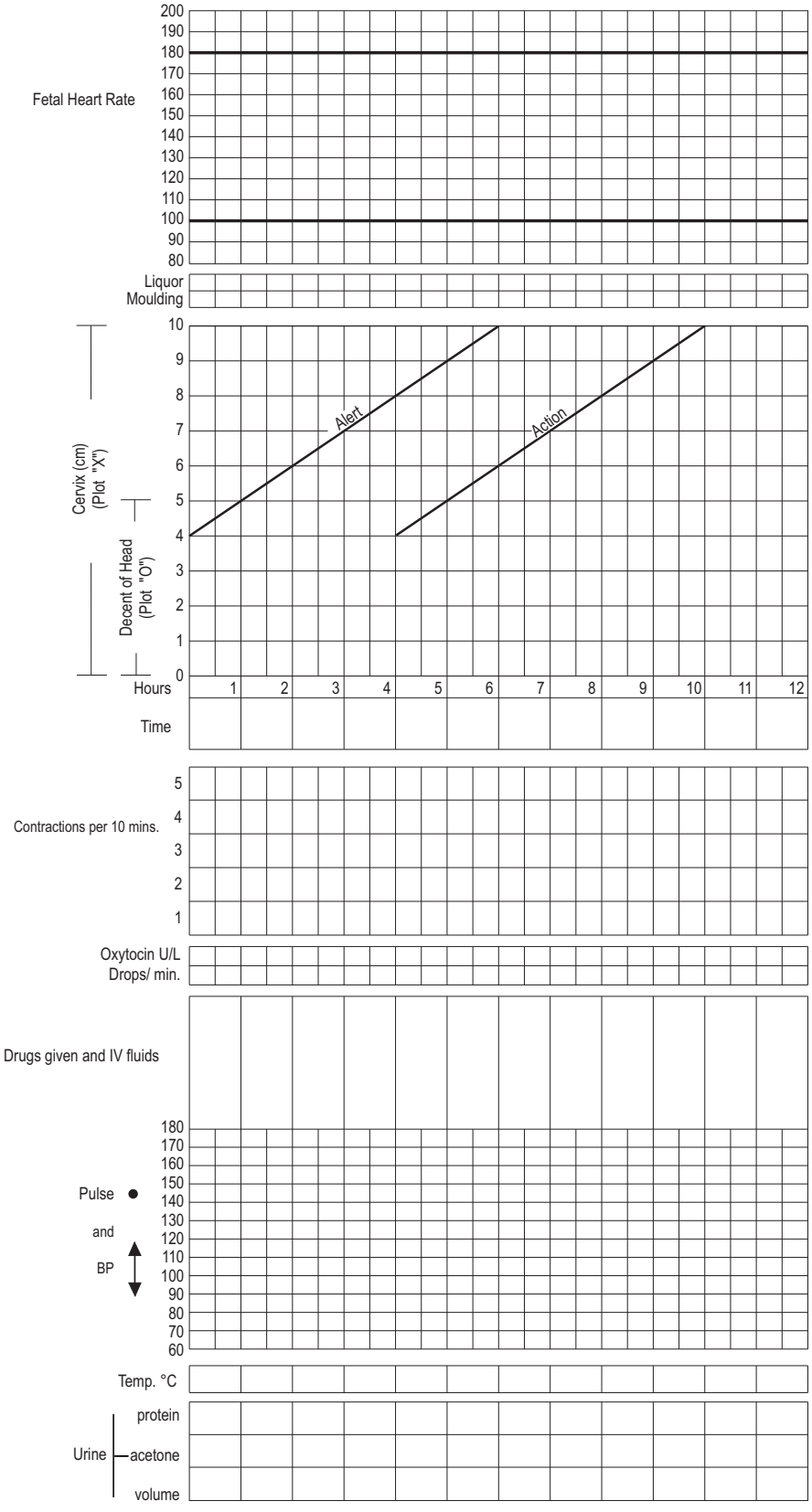
The purpose of this exercise is to enable students to practise using the partograph to manage labour.

| Instructions | Resources |
|---|---|
| Review the partograph with students before beginning the exercise.<br><br>Each student should be given 3 blank partograph forms. | ▪ Partograph forms (3 for each student)<br>▪ Poster-size laminated partograph, if available |
| **Case 1**<br><br>The teacher should read out each step to the class, plot the information on the poster-size laminated partograph and ask the questions included in each of the steps. At the same time students should plot the information on one of their partograph forms.<br><br>**Case 2**<br><br>The teacher should read out each step to the class and have students plot the information on another of their partograph forms. The questions included in each step should be asked as they arise.<br><br>**Case 3**<br><br>The teacher should read out each step to the class and have students plot the information on the third of their partograph forms. The questions should then be asked when the partograph is completed. | |
| Throughout the exercise, the teacher should ensure that students have completed their partograph forms correctly.<br><br>Provide participants with the 3 completed partograph forms from the Answer key, and have them compare these with the partograph forms they have completed. Discuss and resolve any differences between the partographs completed by students, and those in the Answer key. | Partograph Answer key exercise |

# PARTOGRAPH

Name | Gravida | Para | Hospital no.

Date of admission | Time of admission | Ruptured membranes | hours



**Using the partograph: Case 1**

**Step 1:**

- Mrs A was admitted at 5.00 a.m. on 12.5.2000
- Membranes ruptured 4.00 a.m.
- Gravida 3, para 2+0
- Hospital number 7886
- On admission the fetal head was 4/5 palpable above the symphysis pubis and the cervix was 2 cm dilated.

**Q: What should be recorded on the partograph?**

**Note:** The woman is not in active labour. Record only the details of her history, i.e. first 4 bullets, not the descent and cervical dilatation.

**Step 2:**

**09.00 a.m.**

- 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 partograph?**

**Note:** The woman is now in the active phase of labour. Plot this and the following information on the partograph.

- There are 3 contractions in 10 minutes, each lasting 20–40 seconds
- Fetal heart rate (FH) 120
- Membranes ruptured, amniotic fluid clear
- Skull bones separated, sutures easily felt
- Blood pressure 120/70
- Temperature 36.8°C
- Pulse 80 per minute
- Urine output 200 ml; negative protein and acetone.

**Q: What steps should be taken?**
**Q: What advice should be given?**
**Q: What do you expect to find at 1.00 p.m.?**

**Step 3:**

Plot the following information on the partograph:

| | |
|---|---|
| 09.30 a.m. | FH 120, Contractions 3/10 each 30 sec, Pulse 80 |
| 10.00 a.m. | FH 136, Contractions 3/10 each 30 sec, Pulse 80 |
| 10.30 a.m. | FH 140, Contractions 3/10 each 35 sec, Pulse 88 |
| 11.00 a.m. | FH 130, Contractions 3/10 each 40 sec, Pulse 88, Temp 37 |
| 11.30 a.m. | FH 136, Contractions 4/10 each 40 sec, Pulse 84, Head is 2/5 up |
| 12.00 noon | FH 140, Contractions 4/10 each 40 sec, Pulse 88 |
| 12.30 p.m. | FH 130, Contractions 4/10 each 45 sec, Pulse 88 |
| 1.00 p.m. | FH 140, Contractions 4/10 each 45 sec, Pulse 90, Temp 37 |

**1.00 p.m.**

- The fetal head is 0/5 palpable above the symphysis pubis
- The cervix is fully dilated
- Amniotic fluid clear
- Skull bones separated, sutures easily felt
- Blood pressure 100/70
- Urine output 150 ml; negative protein and acetone.

**Q: What steps should be taken?**
**Q: What advice should be given?**
**Q: What do you expect to happen next?**

**Step 4:**

Record the following information on the partograph:

- 1.20 p.m.: spontaneous delivery of a live female infant, Wt. 2.850 g

Answer the following questions:

**Q: How long was the active phase of the first stage of labour?**
**Q: How long was the second stage of labour?**

**Using the partograph: Case 2**

**Step 1:**

- Mrs B was admitted at 10.00 a.m. on 2.5.2000
- Membranes intact
- Gravida 1, para 0+0
- Hospital number 1443.

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

- The fetal head is 5/5 palpable above the symphysis pubis
- The cervix is 4 cm dilated
- There are 2 contractions in 10 minutes, each lasting less than 20 seconds
- FH 140
- Membranes intact
- Blood pressure 100/70
- Temperature 36.2°C
- Pulse 80 per minute
- Urine output 400 ml; negative protein and acetone.

**Q: What is your diagnosis?**
**Q: What action will you take?**

**Step 2:**

Plot the following information on the partograph:

10.30 a.m. FH 140, Contractions 2/10 each 15 sec, Pulse 90
11.00 a.m. FH 136, Contractions 2/10 each 15 sec, Pulse 88, membranes intact
11.30 a.m. FH 140, Contractions 2/10 each 20 sec, Pulse 84
12.00 noon FH 136, Contractions 2/10 each 15 sec, Pulse 88, Temp 36.2

- The fetal head is 5/5 palpable above the symphysis pubis
- The cervix is 4 cm dilated, membranes intact.

**Q: What is your diagnosis?**
**Q: What action will you take?**

**Step 3:**

Plot the following information on the partograph:

12.30 p.m. FH 136, Contractions 1/10 each 15 sec, Pulse 90
1.00 p.m. FH 140, Contractions 1/10 each 15 sec, Pulse 88
1.30 p.m. FH 130, Contractions 1/10 each 20 sec, Pulse 88
2.00 p.m. FH 140, Contractions 2/10 each 20 sec, Pulse 90, Temp 36.8, blood pressure 100/70

- The fetal head is 5/5 palpable above the symphysis pubis
- The cervix is 4 cm dilated, urinary output is 300 ml; negative protein and acetone
- Membranes intact.

**Q: What is your diagnosis?**
**Q: What action should be taken now?**

Plot the following information on the partograph

- Artificial rupture of membranes, amniotic fluid clear
- The cervix is 4 cm dilated, skull bones separated, sutures easily felt
- Labour augmented with oxytocin 2.5 units in 500 ml IV fluid at 10 drops per minute (dpm).

**Step 4:**

Plot the following information on the partograph:

**2.30 p.m**.

- 2 contractions in 10 minutes each lasting 30 seconds
- Infusion rate increased to 20 dpm
- FH 140, pulse 88, blood pressure 120/80.

**3.00 p.m**.

- 3 contractions in 10 minutes each lasting 30 seconds
- Infusion rate increased to 30 dpm
- FH 140, pulse 90.

**3.30 p.m**.

- 3 contractions in 10 minutes each lasting 30 seconds
- Infusion rate increased to 40 dpm
- FH 140, pulse 88.

**4.00 p.m**.

- The fetal head is 2/5 palpable above the symphysis pubis
- The cervix is 6 cm dilated
- 3 contractions in 10 minutes each lasting 30 seconds
- Infusion rate increased to 50 dpm.

**4.30 p.m**.

- FH 140, contractions 3/10 each 45 sec, pulse 90.

**Q: What actions should be taken now?**

**Step 5:**

| | |
|---|---|
| 5.00 p.m. | FH 138, Pulse 88, Contractions 3/10 each 40 sec, Maintain at 50 dpm |
| 5.30 p.m. | FH 140, Pulse 90, Contractions 3/10 each 45 sec, Maintain at 50 dpm |
| 6.00 p.m. | FH 140, Pulse 90, Contractions 4/10 each 50 sec, Maintain at 50 dpm |
| 6.30 p.m. | FH 144, Pulse 90, Contractions 4/10 each 50 sec, Maintain at 50 dpm |

**Step 6:**

Plot the following information on the partograph:

**7.00 p.m**.

- The fetal head is 0/5 palpable above the symphysis pubis
- FH 144, contractions 4/10 each 50 sec, pulse 90
- The cervix is fully dilated.

**Step 7:**

Record the following information on the partograph:

**10.00 p.m**.: Spontaneous delivery of a live male infant, Wt. 2.654 g

Answer the following questions:

**Q: How long was the active phase of the first stage of labour?**
**Q: How long was the second stage of labour?**
**Q: Why was it necessary to augment labour?**

**Using the partograph: Case 3**

**Step 1:**

- Mrs C was admitted at 10.00 a.m. on 12.5.2000
- Membranes ruptured 9.00 a.m.
- Gravida 1, para 3+0
- Hospital number 6639.

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

- The fetal head is 3/5 palpable above the symphysis pubis
- The cervix is 4 cm dilated
- There are 3 contractions in 10 minutes, each lasting 30 seconds
- FH 140
- Amniotic fluid clear
- Sutures apposed
- Blood pressure 120/70
- Temperature 36.8°C
- Pulse 80 per minute
- Urine output 200 ml; negative protein and acetone.

**Step 2:**

Plot the following information on the partograph:

| | |
|---|---|
| 10.30 a.m. | FH 130, Contractions 3/10 each 35 sec, Pulse 80 |
| 11.00 a.m. | FH 136, Contractions 3/10 each 40 sec, Pulse 90 |
| 11.30 a.m. | FH 140, Contractions 3/10 each 40 sec, Pulse 88 |
| 12.00 noon | FH 140, Contractions 3/10 each 40 sec, Pulse 90, Temp 37, Head 3/5 up |
| 12.30 p.m. | FH 130, Contractions 3/10 each 40 sec, Pulse 90 |
| 1.00 p.m. | FH 130, Contractions 3/10 each 40 sec, Pulse 88 |
| 1.30 p.m. | FH 120, Contractions 3/10 each 40 sec, Pulse 88 |
| 2.00 p.m. | FH 130, Contractions 4/10 each 45 sec, Pulse 90, Temp 37, Blood pressure 100/70 |

- The fetal head is 3/5 palpable above the symphysis pubis
- The cervix is 6 cm dilated, amniotic fluid clear
- Sutures overlapped but reducible.

**Step 3:**

| | |
|---|---|
| 2.30 p.m. | FH 120, Contractions 4/10 each 40 sec, Pulse 90, Liquor clear |
| 3.00 p.m. | FH 120, Contractions 4/10 each 40 sec, Pulse 88, Clear blood stained |
| 3.30 p.m. | FH 100, Contractions 4/10 each 45 sec, Pulse 100 |
| 4.00 p.m. | FH 90, Contractions 4/10 each 50 sec, Pulse 100, Temp 37 |
| 4.30 p.m. | FH 96, Contractions 4/10 each 50 sec, Pulse 100, Head 3/5 up, Meconium liquor |
| 5.00 p.m. | FH 90, Contractions 4/10 each 50 sec, Pulse 110 |

- The fetal head is 3/5 palpable above the symphysis pubis
- The cervix is 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 partograph::

- Cesarean section at 5.30 p.m. live female infant with poor respiratory effort born, Wt. 4.850 g.

Answer the following questions:

**Q: What is the final diagnosis?**

**Q: At 12.00 noon, what observation should have caused concern and what other examination would have helped in deciding on a course of action?**

**Q: What action was indicated at 2.00 p.m., and why?**

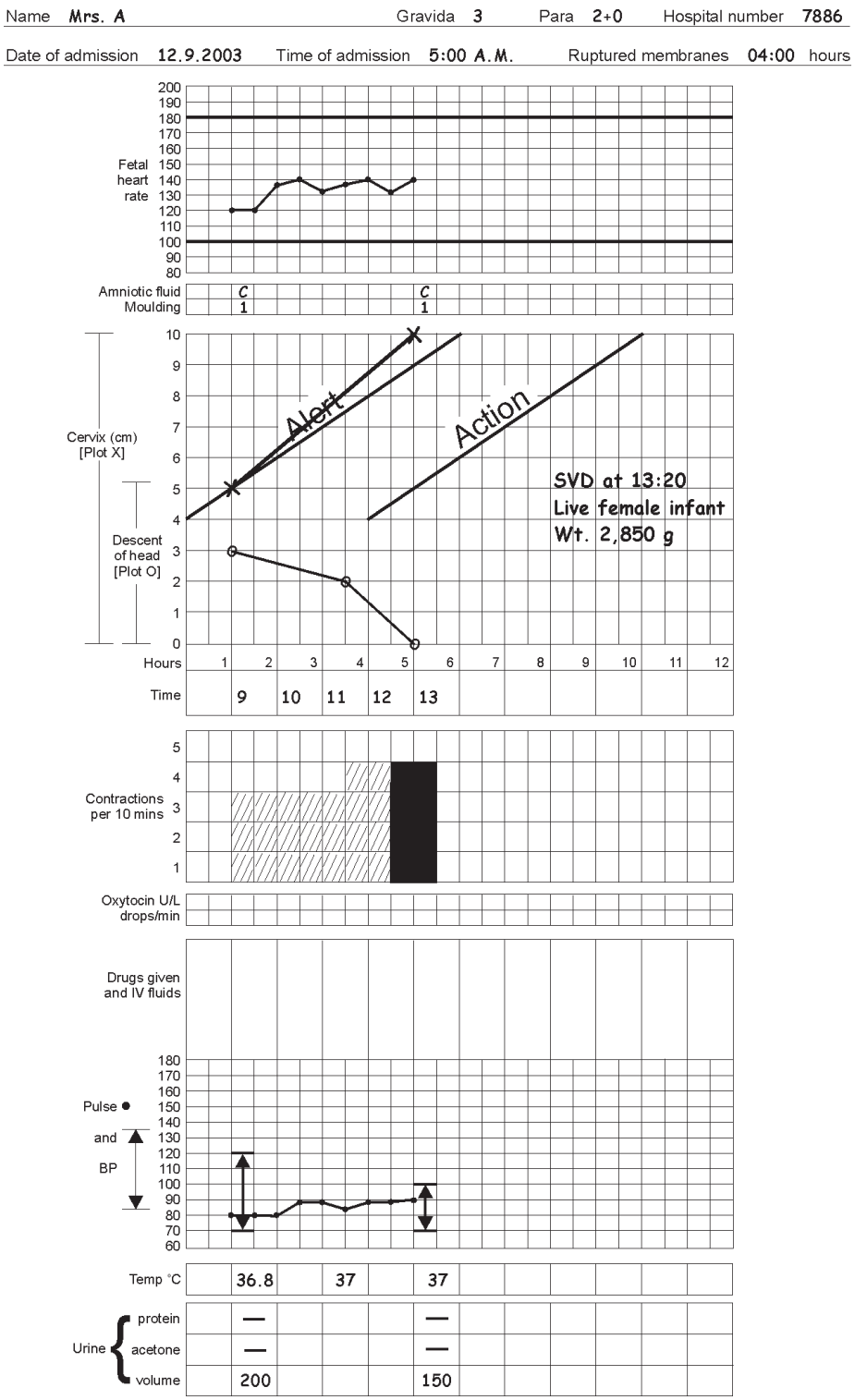
**Q: At 5.00 p.m., a decision was taken to do a cesarean section immediately and a live female infant was delivered at 5.30 p.m. Was this a correct action?**

**Q: What problems may be expected in the newborn?**

## Exercise 4.1: Using the partograph

## Answer key

### Case 1



**Step 1**

Q. What should you record on the partograph?

A. See partograph for Case 1.

**Step 2**

Q. What should you record on the partograph?

A. See previous partograph for Case 1.

Q: What steps should be taken?

A: Inform Mrs A of the findings and tell her what to expect; encourage her to ask questions; provide comfort measures, hydration, nutrition.

Q: What advice should be given?

A: Advise Mrs A to assume position of choice; drink plenty of fluids; eat as desired.

Q: What do you expect to find at 1.00 pm?

A: Progress to at least 8 cm dilatation.

**Step 3**

Q: What steps should be taken?

A: Prepare for the birth.

Q: What advice should be given?

A: Advise Mrs A to push only when she has the urge to do so.

Q: What do you expect to happen next?

A: Spontaneous vertex delivery.

**Step 4**

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

A: 5 hours.

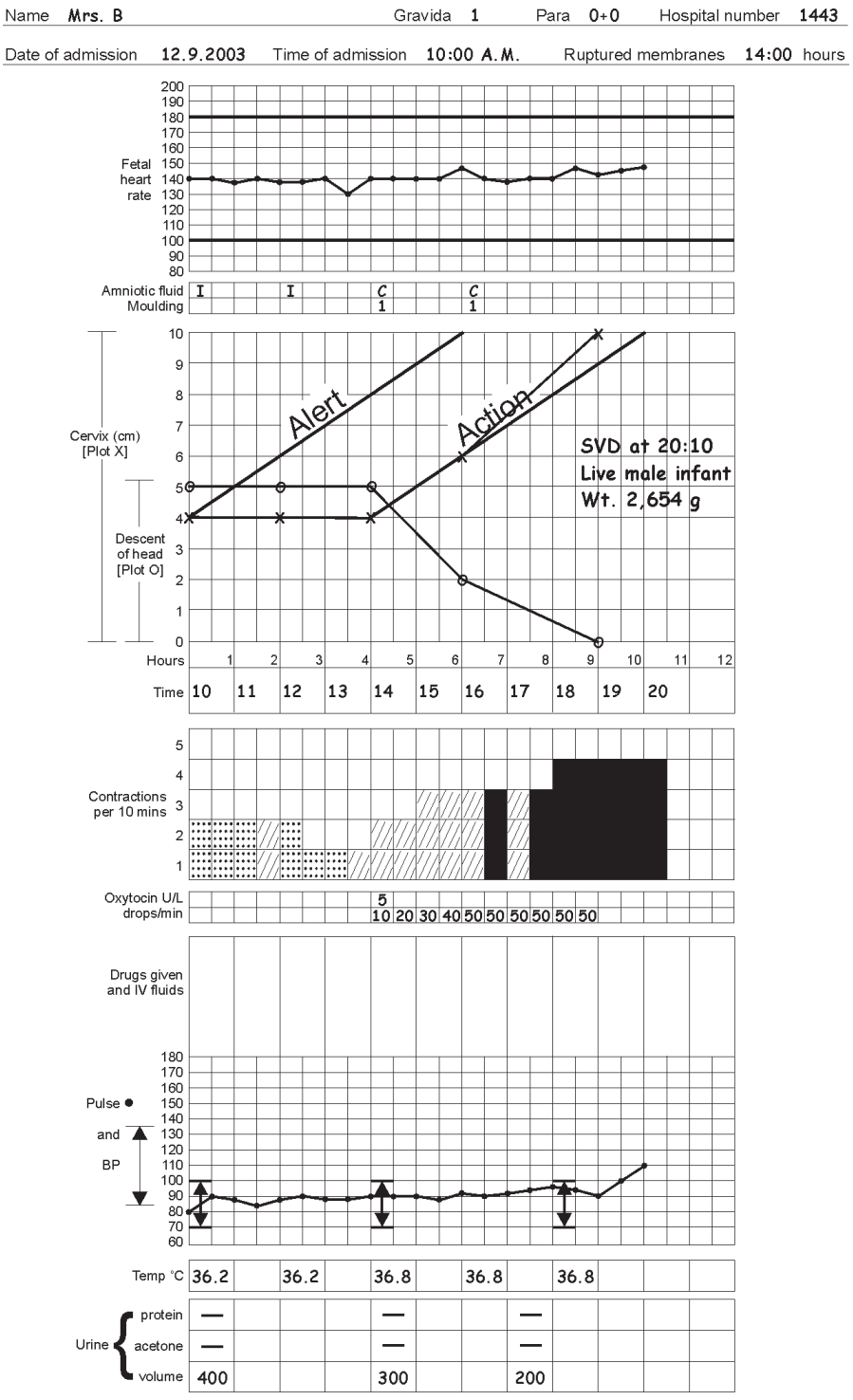
Q: How long was the second stage of labour?

A: 20 minutes.

## Exercise 4.1: Using the partograph

## Answer key

### Case 2



**Step 1**

**Have students compare the recordings on their partographs with the partograph for Case 2.**

Q. What is your diagnosis?

A. Mrs B is in active labour.

Q. What action will you take?

A. Inform Mrs B of findings and what to expect; encourage her to ask questions; encourage her to be mobile and to drink and eat as desired.

**Step 2**

**Have students compare the recordings on their partographs with the partograph for Case 2.**

Q. What is your diagnosis?

A. Failure to progress; poor uterine action; but good fetal and maternal condition.

Q: What action will you take?

A: Inform Mrs B of findings and what to expect; continue to encourage her to ask questions; continue to encourage her to be mobile and to drink and eat as desired; make preliminary plans for surgical intervention should this be necessary, or refer to a facility where this is possible.

**Step 3**

**Have students compare the recordings on their partographs with the partograph for Case 2.**

Q: What is your diagnosis?

A: Failure to progress; poor uterine action, although improved at 2.00 p.m; fetal and maternal condition continues to be good.

Q: What action should be taken now?

A: Labour should be augmented with oxytocin following artificial rupture of membranes; inform Mrs B of findings and what to expect; provide reassurance and support; answer questions; encourage her to drink and assume position of choice.

**Step 4**

**Have students compare the recordings on their partographs with the partograph for Case 2.**

Q: What action should be taken now?

A: Labour should be augmented with oxytocin; continue to provide reassurance, comfort and support. Continue to augment, provide comfort (psychological and physical); encourage drink and nutrition.

**Step 5**

**Have students compare the recordings on their partographs with the partograph for Case 2.**

**Step 6**

**Have students compare the recordings on their partographs with the partograph for Case 2.**

**Step 7**

**Have students compare the recordings on their partographs with the partograph for Case 2.**

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

A: 9 hours.

Q: How long was the second stage of labour?

A: 1 hour, 10 minutes.

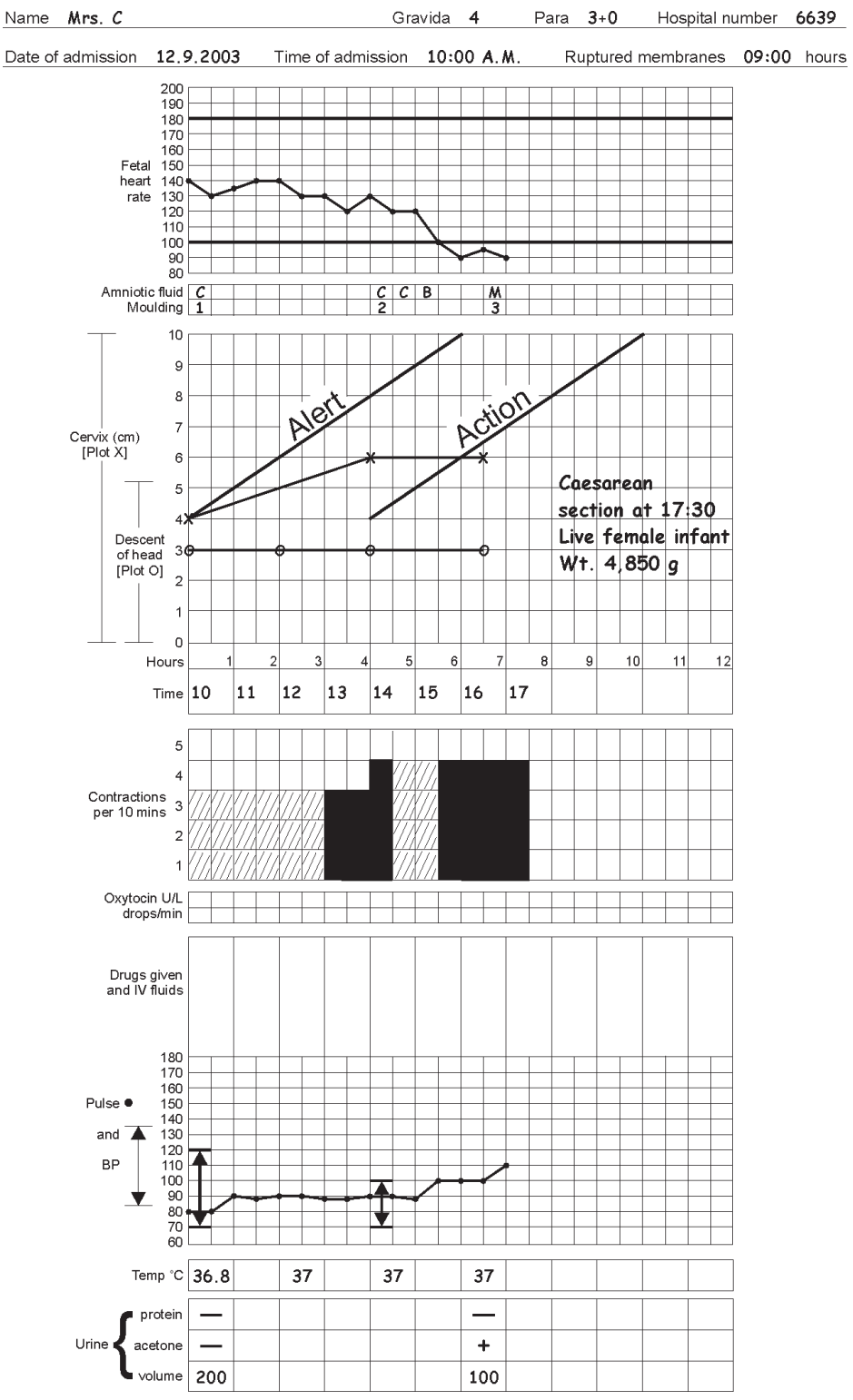
Q: Why was it necessary to augment labour?

A: Mrs B failed to progress in labour because of poor uterine action.

## Exercise 4.1: Using the partograph

## Answer key

### Case 3



**Step 1**

**Have students compare the recordings on their partographs with the partograph for Case 3.**

**Step 2**

**Have students compare the recordings on their partographs with the partograph for Case 3.**

**Step 3**

**Have students compare the recordings on their partographs with the partograph for Case 3.**

**Step 4**

**Have students compare the recordings on their partographs with the partograph for Case 3.**

Q: What is the final diagnosis

A: Failure to progress (obstructed labour).

Q: At 12.00 noon, what observation should have caused concern and what other examination would have helped in deciding on a course of action?

A: The head remained 3/5 above the symphysis pubis, despite adequate contractions. A vaginal examination to assess cervical dilatation and assessment of moulding would have been appropriate at this time, even though the last one was done two hours before.

Q: What action was indicated at 2.00 p.m., and why?

A: Cesarean section should have been considered at this time because cervical dilatation was slow, and there had been no further descent of the head, despite good contractions.

Q: At 5.00 p.m. a decision was taken to do a cesarean section immediately and a live female infant was delivered at 5.30 p.m. Was this action correct?

A: Yes, because the fetal condition was deteriorating and labour had failed to progress despite strong contractions; in addition, Mrs C's pulse was rising and there was acetone in her urine.

Q: What problems may be expected in the newborn.

A: Birth asphyxia, meconium aspiration.

# 5 MANAGING PROLONGED LABOUR

# SESSION 5
# MANAGING PROLONGED LABOUR

**Aims**

- To enable students to understand the interventions necessary in cases of prolonged labour.
- To enable students to manage and appropriately refer the woman when necessary.

**Objectives**

On completion of Session 5, students will be able to:

- Describe the management of prolonged latent phase of labour.
- Describe the management of prolonged active phase of labour.
- Describe the management of prolonged expulsive phase of labour.

**Plan**

Modified lecture (2 hours).

This session should be taught in close association with Session 6. It is important that students not only know what to do, but can actually do it.

**Resources**

*Managing complications in pregnancy and childbirth: a guide for midwives and doctors.*
Geneva, World Health Organization, 2003 (WHO/RHR/00.7).

## INTRODUCTION

*Emphasize the need first of all to identify the problem. This means suspecting that the woman is not progressing satisfactorily in labour. If she is not, then the cause of the problem must be identified and managed accordingly.*

*In order to help students decide on the necessary management, it is essential to consider the situation in a remote area or peripheral health facility as well as in a well-equipped health facility with appropriate obstetric help.*

*Remind students of the six steps to effective management (refer back to Session 3).*

## MANAGEMENT OF PROLONGED LATENT PHASE

*Present and discuss the following information with students. As you do so, ask them to share their experiences with respect to management of prolonged latent phase. Discuss and resolve any differences in the management described by students.*

Diagnosis of the prolonged latent phase of labour is made retrosepctively. When contractions cease, the woman is said to have been in false labour. When contractions become regular and dilatation progresses to 4 cm, the woman is said to have been in the latent phase.

It is important to note that misdiagnosing false labour or prolonged latent phase may lead to unnecessary induction or augmentation of labour which may fail. This in turn may lead to unnecessary caesarean section and amnionitis.

If the **woman has been in the latent phase for more than 8 hours** and there is **little sign of progress**, reassess the situation by assessing the cervix, as follows:

- If there has been **no change in cervical effacement or dilatation** and there is no fetal distress, review the diagnosis. The woman may not be in labour
- If there has been a **change in cervical effacement or dilatation**, the membranes should be ruptured with an amniotic hook or a Kocher clamp and labour should be induced:
  - the woman should be assessed every 4 hours
  - if she has **not entered the active phase of labour after 8 hours of induction**, she should be delivered by caesarean section.

- If there are **signs of infection** (fever, foul-smelling vaginal discharge):
  - labour should be augmented immediately with oxytocin
  - antibiotics should be given until delivery, as follows:
    ampicillin 2 g IV every 6 hours, **and**
    gentamicin 5 mg/kg body weight IV every 24 hours.

  If the woman delivers vaginally, discontinue antibiotics postpartum. If the woman has a casesarean section, continue antibiotics **and** give metronidazole 500 mg IV every 8 hours until she is fever-free for 48 hours.

*Ask if there are any questions before continuing.*

## MANAGEMENT OF PROLONGED ACTIVE PHASE

*Present and discuss the following information with students. As you do so, ask them to share their experiences with respect to management of prolonged active phase. Discuss and resolve any differences in the management described by students.*

- Assess uterine contractions:
  - If **contractions are inefficient** (less than 3 contractions in 10 minutes, each lasting less than 40 seconds), suspect inadequate uterine activity and refer to higher level care
  - If **contractions are efficient** (3 contractions in 10 minutes, each lasting more than 40 seconds), suspect cephalopelvic disproportion, obstruction, malposition or malpresentation and refer to higher level care.

If there are **no signs of cephalopelvic disproportion or obstruction** and the contractions are regular and strong and the **membranes are intact**, the membranes should be ruptured with an amniotic hook or a Kocher clamp.

- Continue to monitor maternal and fetal well-being and the progress of labour and be prepared to refer to higher level care if normal progress does not resume. Provide general methods of labour support that may improve contractions and accelerate progress. These may include the following:
  - Encourage the woman's birth companion to give adequate support (rub the woman's back, wipe her face and brow with a wet cloth, assist her to move about)
  - Explain all procedures to the woman, seek permission and discuss findings with her
  - Provide a supportive, encouraging atmosphere for the birth, respectful of the woman's wishes
  - Encourage her to empty her bladder regularly
  - Encourage breathing techniques.

*Ask if there are any questions before continuing.*

*Remind students that the above management will be influenced by geography, and distance to higher level care.*

## MANAGEMENT OF PROLONGED EXPULSIVE PHASE

*Present and discuss the following information with students. As you do so, ask them to share their experiences with respect to management of the prolonged expulsive phase. Discuss and resolve any differences in the management described by students.*

Maternal expulsive efforts increase fetal risk by reducing the delivery of oxygen to the placenta. While spontaneous maternal "pushing" should be allowed, prolonged effort and holding the breath should not be encouraged. If malpresentation and obvious **obstruction have been ruled out**, labour should be augmented with oxytocin.

If there is **no descent after augmentation** and:

- If the **head is not more than 1/5 above** the symphysis pubis or the leading bony edge of the fetal **head is at the 0 station**, delivery should be by vacuum extraction or forceps
- If the head is **between 1/5 and 3/5** above the symphisis pubis or the leading bony edge of the fetal **head is between 0 station and -2 station**, and birth is taking place in the woman's home or in a facility where safe caesarean section is not possible, delivery should be by vacuum extraction and symphysiotomy
- If the service **provider is not proficient in symphysiotomy**, immediate referral is required for delivery by caesarean section
- If the head is **more than 3/5 above** the symphisis pubis or the leading bony edge of the fetal **head is above -2 station**, delivery must be by caesarean section.

*Summarize the session and answer any remaining questions.*

# 6 MANAGING OBSTRUCTED LABOUR

# SESSION 6
# MANAGING OBSTRUCTED LABOUR

**Aims**

- To enable students to understand the interventions necessary in cases of obstructed labour.
- To enable students to manage and appropriately refer the woman for skilled obstetric help.

**Objectives**

On completion of Session 6, students will be able to:

- Explain how to prevent and manage dehydration and ketosis in cases of obstructed labour.
- Describe the signs of infection in cases of obstructed labour and the antibiotics which may be used, including dosages and routes of administration.
- Describe the supportive care that should be provided for a woman who experiences obstructed labour.
- Describe the options for delivery of the baby in cases of obstructed labour.
- Describe the procedure for referral of a woman who needs skilled obstetric help and discuss how this can be implemented or improved in practice, including writing a letter of referral.
- Write a letter of referral for a woman who is to be transferred.
- Explain the infection prevention practices applicable to managing prolonged and obstructed labour.

**Plan**

Modified lecture (2 hours).

Group work (1 hour).

Drama and written exercises (1½ hours).

This session should be taught in close association with Session 7 and Session 8. It is important to ensure that students not only know what to do, but can actually do it.

**Resources**

Instructions for Group Work.

Obstetric management chart: difficult labour.

Obstetric management chart: referral management.

Referral management: example of a referral letter.

Essex B. *Management of obstetric emergencies in a health centre. A handbook for midwives.* Churchill Livingstone, 1985 (used with the permission of the author).

Managing complications in pregnancy and childbirth: a guide for midwives and doctors. Geneva, World Health Organization, 2003 (WHO/RHR/007).

## INTRODUCTION

*Emphasize the need first of all to identify the problem. This means suspecting that the woman is in obstructed labour. If she is not, then the cause of the problem must be identified and managed accordingly.*

*In order to help students decide on the necessary management, it is essential to consider the situation in a remote area or peripheral health facility, as well as in a well-equipped health facility with appropriate obstetric help.*

## MANAGEMENT OF OBSTRUCTED LABOUR

*Remind students of the six steps to effective management (refer back to Session 3).*

Stress the importance of working quickly and according to priorities so that urgent things are done first.

### 1. Rehydrate the patient

Aim: To maintain normal plasma volume and prevent or treat dehydration and ketosis.

(a) Put up an IVI. Use a large needle (No. 18) or cannula.

(b) If the woman is shocked, give normal saline or Ringer's lactate. Run in 1 litre as quickly as possible, then repeat 1 litre every 20 minutes until the pulse slows to less than 90 beats per minute, systolic blood pressure is 100 mm Hg or higher. However, if breathing problems develop, reduce to 1 litre in 4–6 hours.

(c) If the woman is not in shock but is dehydrated and ketotic, give 1 litre rapidly and repeat if still dehydrated and ketotic. Then reduce to 1 litre in 4–6 hours.

(d) Keep an accurate record of all intravenous fluids infused, and urinary output.

### 2. Give antibiotics

If there are signs of infection, or the membranes have been ruptured for 18 hours or more, or the period of gestation is 37 weeks or less, give antibiotics as follows:

- ampicillin 2 g every 6 hours, **and**
- gentamicin 5 mg/body weight IV every 24 hours.

If the woman is delivered by caesarean section, continue antibiotics **and** give metronidazole 500 mg IV every 8 hours until the woman is fever-free for 48 hours.

### 3. Give supportive care

The woman's birth companion should be encouraged to stay with her to provide comfort and support. Staff should explain all procedures to the woman, seek her permission, discuss results with her, listen and be sensitive to her feelings.

### 4. Deliver the baby

The doctor will assess the woman and her progress in labour and decide on the mode of delivery.

**Cephalopelvic disproportion:**

- If **cephalopelvic disproportion is confirmed**, delivery should be by caesarean section
- If the **fetus is dead**:
  - delivery should be by craniotomy
  - if this is not possible, delivery should be by caesarean section.

**Obstruction:**

- If the **fetus is alive, the cervix is fully dilated** and the **head is at 0 station or below**, deliver by vacuum extraction
- If the fetus is alive and the cervix is fully dilated and there is evidence of indication for **symphysiotomy** for relatively minor obstruction (if safe caesarean section is not possible) and the fetal **head is at -2 station,** then delivery should be by symphysiotomy and vacuum extraction.
- If the **fetus is alive but the cervix is not fully dilated** or if the **fetal head is too high for vacuum extraction**, referral should be made immediately for delivery by caesarean section
- If the fetus is dead:
  - delivery should be by craniotomy
  - if this is not possible, delivery should be by caesarean section.

If the woman requires referral to a higher level health facility, initial management will be similar because preparation for the journey is essential:

- set up IVI to rehydrate
- give antibiotics
- give supportive care
- give analgesic
- monitor maternal and fetal condition.
- ensure referral letter is completed and make transportation arrangements. Contact the referral centre by phone if possible to advise them of transfer.

A health care worker should accompany the woman on the journey, together with a relative who could act, if necessary, as a blood donor on arrival at the hospital.

*Emphasize the aim of management, i.e. to save life and prevent further damage. Also stress the principles of management, especially the need to avoid unnecessary delay. Delay means death or damage.*

*Work step by step with the students through the Obstetric management chart on difficult labour, provided at the end of the session. Ask if there are any questions. Summarize the session so far.*

## 5. Referral

*Use the Obstetric management chart on referral management, also provided at the end of the session. Work through it in the same way as the chart on difficult labour. If you have a standard referral letter, show a copy to the students. If not, use the example provided.*

*Work through the form of the letter, and emphasize the importance of filling in all the details. (The cervical dilatation should be entered in centimetres and not in "fingers" as in the example).*

## 6. Infection prevention

*Infection prevention procedures are critical to the management of any complication in pregnancy and childbirth. Prevention of infection is particularly important in cases of prolonged and obstructed labour, due to the high risks associated with the interventions required for the management of such cases. Ask students to list the reasons why infection prevention practices are important. Write down their responses on a blackboard or flip chart, which should include the following:*

- *to decrease the transmission of blood-borne pathogens such as HBV (hepatitis B virus) and HIV*
- *to protect patients*
- *to protect staff*
- *to protect the community.*

*Now ask students to list the five standard practices involved in "Universal Precautions". Write down their responses on the blackboard, which should include the following:*

- *handwashing*
- *use of protective barriers such as gloves, gowns, plastic aprons and goggles to prevent direct contact with blood and other body fluids*
- *safe decontamination of instruments and other contaminated equipment*
- *safe handling and disposal of sharps*
- *safe disposal of waste contaminated with blood and other body fluids.*

*Remind students that Universal Precautions are based on the assumption that all blood is potentially infectious, regardless of whether it is from a patient or health care worker. The Precautions aim to*

*reduce, to an absolute minimum, the accidental exposure of patients and health care workers to potentially infectious blood.*

*Continue by reviewing the following infection prevention practices with the class. Depending on the needs and abilities of students, you may wish to demonstrate some of these practices. If the information below has already been covered recently in a previous module, summarize the following, as a reminder.*

**Handwashing**

Handwashing is important to reduce the spread of infection because the mechanical friction of washing with soap and water removes many of the pathogens responsible for disease transmission. Running water should be used rather than bowls of water (if piped water is not available, a clean, refillable container with a tap attached should be used). Either plain or antiseptic soap can be used. A clean towel should be used for drying hands.

Hands should always be washed at the following times:

**Before** performing a physical or pelvic examination or other procedure

**Before** putting on gloves

**After** handling used (soiled) instruments

**After** touching mucous membranes, tissue, blood or other body fluids

**After** taking off gloves

**Between** contact with different patients.

**Glove use**

New gloves or gloves that have been high-level disinfected should be worn by health care workers when performing pelvic examinations and other procedures, especially when the hands might be exposed to blood or body fluids. Gloves must be changed between patients and between procedures.

Health care workers who clean or handle used instruments and who have the potential for contact with blood, should wear gloves when cleaning up after a procedure, disposing of waste or processing soiled linen. Thick utility gloves are preferable for these activities.

Gloves must be intact (i.e. must be free from holes, tears, cracks, peeling). They should be checked before use and any that have holes, tears, cracks or are peeling should be discarded.

**Apron, gown and goggle use**

Plastic or rubber aprons should be worn for protection during procedures where splashing of blood or other body fluids is anticipated. During surgical procedures, where there is a high

likelihood of splashing of blood, a fluid-repellent gown or a sterile cloth gown with a plastic apron underneath should be worn.

### Decontamination of instruments

Microorganisms left on surfaces or instruments by contact with blood or body fluids can transmit blood-borne infections to staff and patients. Instruments and surfaces should be processed appropriately to reduce the risk of transmitting infection.

The process required for cleaning reusable instruments or surfaces will depend on what they may have touched and what they will touch. Used instruments that may have touched and been contaminated by blood or body fluids should always be decontaminated with a 0.5% chlorine solution immediately after use. Decontamination makes instruments and surfaces safer to handle by killing many of the pathogens before further cleaning. It also makes instruments easier to clean.

Instruments and gloves that have been used should be placed in a 0.5% chlorine solution for 10 minutes immediately after a procedure. Before placing the instruments into the chlorine solution, they should be physically cleaned to remove all debris. This should be done with soap and under running water. Cleaning is essential before further processing, because removing material from the surface will allow solutions to contact the surface of the instruments. Chlorine can be corrosive to metal and therefore instruments should be removed after soaking for 10 minutes.

- *Instruments and gloves should be rinsed after decontamination*
- *Examination tables and surfaces that may have been contaminated should be wiped clean with a chlorine solution*
- *Suction tubing used with electric aspiration pumps should be flushed with water immediately after use to remove blood and organic material.*

After decontamination, all reusable instruments need further processing. The choice of process will depend on what they will touch when they are used.

### Cleaning

After decontamination, all instruments should be washed thoroughly in warm (not hot) water and detergent. When high-level disinfection is to be carried out, cleaning is the last chance to physically remove bacterial endospores that are not killed by high-level disinfection.

Warm water with detergent is recommended for cleaning because hot water can coagulate protein, making it more difficult to remove. Detergent is needed because water alone will not remove proteins or oils and is preferable to soap, which may leave a residue.

It is important to wash all surfaces of instruments. Small brushes or cloths can be used to scrub items such as specula, forceps and needle holders. However, these should be cleaned after use and

regularly replaced as they can be a source of infection transmission. All surfaces of instruments should be cleaned, paying special attention to crevices and joints where blood or tissue can collect.

After cleaning, instruments should be rinsed inside and out and then dried, either with a clean towel or by allowing the air to dry them. If instruments are to be boiled, drying is not necessary.

Detergent and warm water should be used for routine cleaning of floors, beds, toilets, walls, and rubber draw sheets. All soiled linen should be handled as little as possible, bagged at the point of collection and not sorted or rinsed in patient care areas. If possible, linen soiled with large amounts of blood and other body fluids should be transported in leakproof bags. If leakproof bags are not available, the linen should be folded with the soiled parts inside and handled carefully, with gloves.

### Sterilization and high-level disinfection

Instruments that may have been in contact with blood, body fluid or tissue, should be sterilized. If this is not possible, high-level disinfection is the only acceptable alternative. Instruments in this category include cannulae, curettes, dilators, needles, syringes, and forceps. Processes for sterilization and high-level disinfection include:

- autoclaving (pressure steam)
- gas sterilization (using ethylene oxide)
- boiling
- soaking in chemical high-level disinfectants.

The appropriate method for sterilization or high-level disinfection depends on the type of instruments and the resources available at a facility.

Boiling is the simplest and most reliable method for inactivating most pathogenic microbes, including hepatitis B virus and HIV, when sterilization either by steam or dry heat is not possible.

High-level disinfection should be achieved by soaking instruments in a solution of hypochlorite bleach [5 minutes contact at 20–25°C with buffered hypochlorite (pH = 7–8) at a concentration of 5000 ppm available chlorine], or fresh glutaraldehyde [5 hours contact at 20–25°C with 2% activated alkaline formulation (pH = 7.5–9)]. High-level disinfection destroys all microorganisms including hepatitis B virus and HIV but does not reliably kill bacterial endospores. The use of phenol or antiseptics will not achieve high-level disinfection. Instruments must be rinsed with sterile water after disinfection.

### Mid-level disinfection

For instruments that do not contact the bloodstream or tissue beneath the skin, decontamination followed by washing and then

mid-level disinfection is adequate if high-level disinfection is not possible. For example, syringes can be mid-level disinfected by soaking in alcohol (70–95% solution) or iodophors (10% solution). Both of these agents are easily inactivated by organic materials so it is important to change the solution if it becomes cloudy. Even if the solution does not become cloudy, alcohol solutions should be changed weekly or daily if used heavily; iodophors should be changed daily.

**Storage of instruments**

Instruments must be stored appropriately to maintain sterility/ high-level disinfection. Instruments (e.g. cannulae) that are sterilized in chemical solutions should be handled with sterile forceps. The instruments should be rinsed well with sterile water or saline, air dried, and wrapped in sterile paper or cloth, without touching the instrument or the inside of the sterile wrap. Sterile packages should be dated, stored in a clean, dry space, and used within one week. If they are not used within one week, the instruments must be cleaned again and resterilized.

Alternatively, sterile instruments may be stored in a sterile, covered container. Sterile technique must be maintained when removing or replacing the instruments. The container must be dated and resterilized weekly.

**Handling and disposal of "sharps"**

Needles or "sharps" should be handled carefully during use, placed in a puncture-proof container immediately after use, and should preferably be incinerated.

The greatest hazard of HIV transmission in health care settings is through skin puncture with contaminated needles or "sharps". Most "sharps" injuries involving HIV transmission are through deep injuries with hollow-bore needles. Such injuries frequently occur when needles are recapped, cleaned, or disposed of inappropriately.

Puncture-resistant disposal containers must be available and readily accessible (i.e. at the point of use) for the disposal of "sharps". Many easily available containers such as a tin with a lid, a thick plastic bottle with a lid, or a heavy plastic or cardboard box with a small opening in the top can be used as "sharps" containers. It is important to dispose of containers when they are three–quarters full, and to wear heavy-duty gloves when transporting "sharps" containers to the incinerator.

**Waste disposal**

Disposable solid waste such as gauze and cotton, laboratory and pathology wastes should be placed in properly marked, leak-proof containers or plastic bags and then incinerated or buried in a 7 foot deep pit, at least 30 feet away from a water source.

Liquid wastes such as blood and tissue, excretions and secretions, should be carefully poured down a drain connected to an adequately treated sewer system, or disposed of in a pit latrine.

Remind students that these infection prevention practices will apply to the clinical skills in the following session(s).

*Ask if there are any questions.*

*Summarize.*

## GROUP WORK

*Divide the students into groups and provide them with:*

- *Instructions for Group Work (drama). included at the end of the session*
- *Partograph from a medical record of a woman with obstructed labour, if available (otherwise the teacher should make up one)*
- *Blank standard referral letter which is used in your country.*

### Feedback

*Arrange for the groups to present their drama. Use the obstetric management chart on referral management as a checklist to make sure that students have included all that is necessary.*

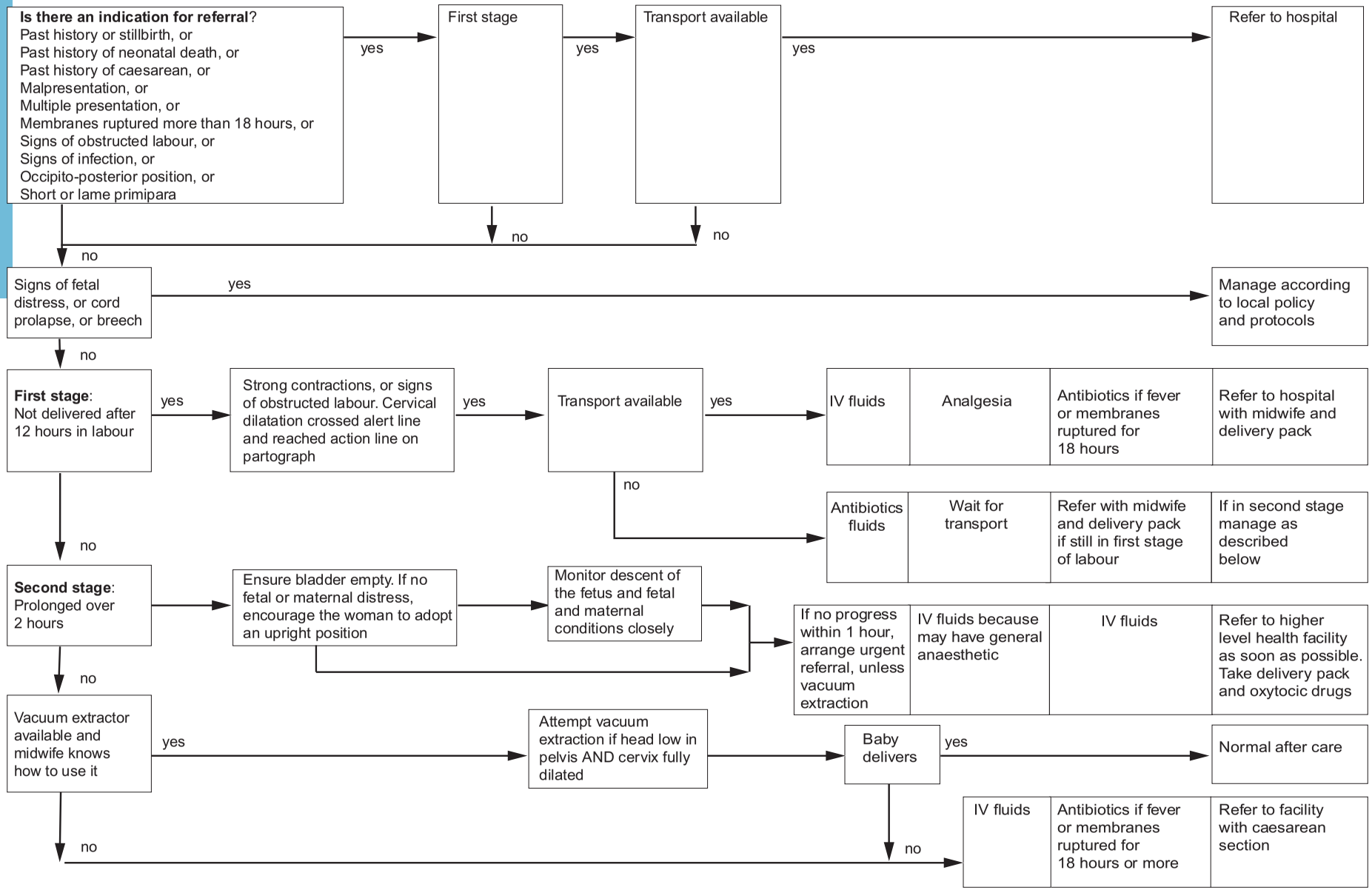
*Allow students to look at the referral letters. Discuss whether each group has approached the referral in a safe way. Also discuss any other practical issues which may arise from the use of this procedure.*

*Where students encounter problems, identify how these problems can be addressed. A good way to do this is to write an action plan. Students will be familiar with this approach from previous modules and should be able to do this.*

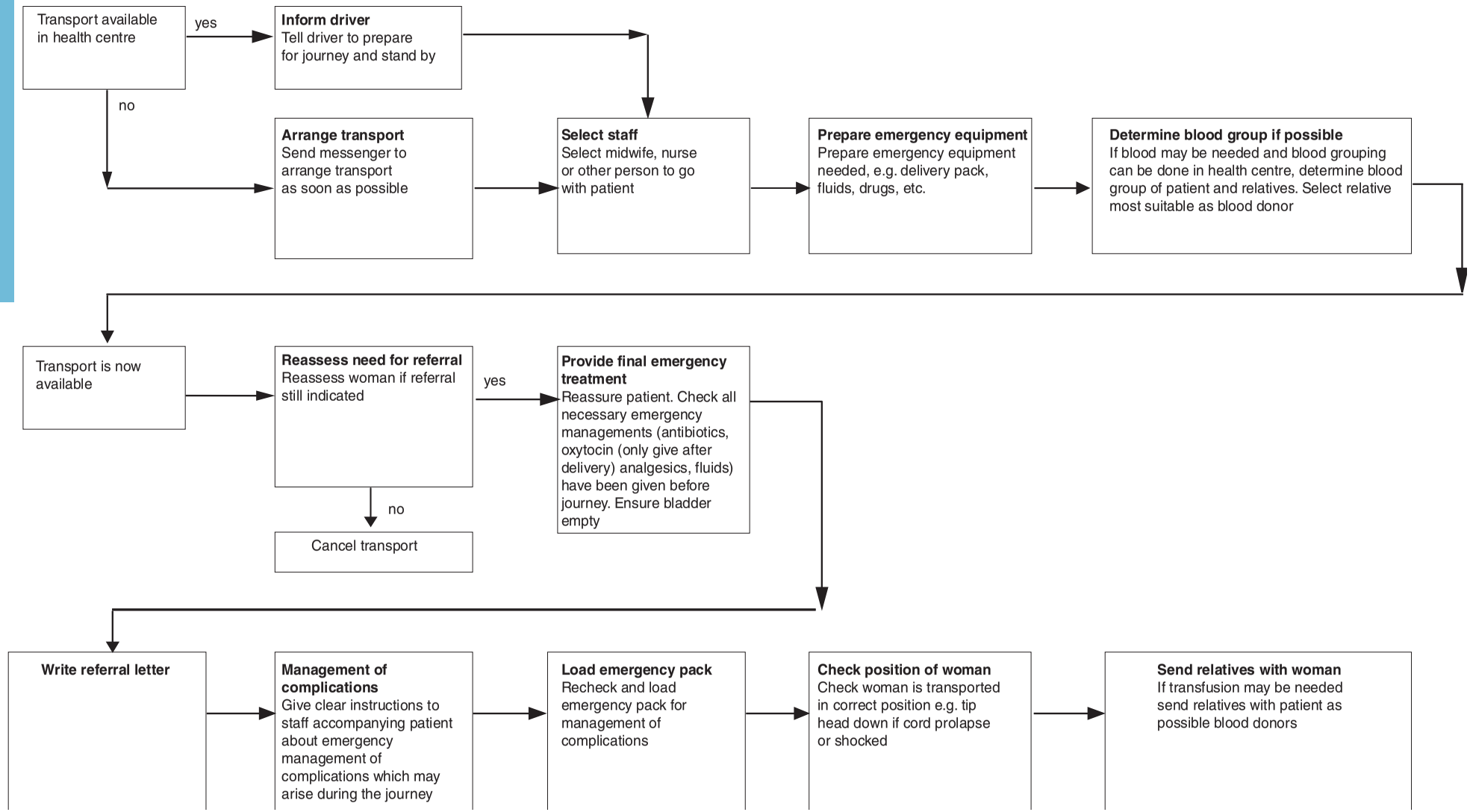
*When an action plan is written, remember to set a date to evaluate progress. On completion, ask if there are any questions.*

*Summarize.*

## Obstetric management chart: difficult labour



## Obstetric management chart: referral management



## INSTRUCTIONS FOR GROUP WORK

You are provided with a partograph which shows the situation of a woman in your care in a peripheral health centre.

1. Through drama, demonstrate how you would make arrangements for the referral and transfer of this woman.

   Use the procedure demonstrated in the Obstetric management chart: referral management, or the notes you have taken during this session.

2. Write a referral letter for the woman to take to hospital.

   Copy this letter onto a flipchart or large piece of paper or overhead projector, in order to discuss the contents with the class.

## Referral management: example referral letter

| | | |
|---|---|---|
| **Patient's name** | *Address:* | |
| **Name and designation of person making the referral** | *Address:* | |
| **Date and time when patient first seen** | *4 April, 2004 at 8.00 p.m* | |
| **Past history** | *1 child alive.*<br>*Stillbirth one year ago.* | |
| **Present problem** | *Despite strong, regular contractions, cervical dilatation crossed alert line and now on action line. Head remains 4/5 palpable. Suspect cephalopelvic disproportion.* | |
| **Management** | *Routine labour management. Encouraged upright position, bladder emptied in last 4 hours.* | |
| **Main reason(s) for referral** | *Poor progress after 12 hours of strong contraction. Cervical dilatation has crossed the alert line and reached the actionline on the partograph. Fetal head remains high. History of previous stillbirth, causes unknown* | |
| **Date/time of arrival at health centre** | *5 April, 2004 at 2.00 p.m.* | |
| **Condition at time of arrival at health centre** | *Dilatation of cervix 5 cm.*<br>*Fetal heart mutent condition*<br><br>*Contractions 3 every 10 minutes, lasting 45–50 seconds.*<br>*120 regular and strong, becoming tired and distressed.* | |
| **Blood Pressure:**<br>*130/180* | **Fetal heart rate***:*<br>*20/min* | **Bleeding***: Yes/No*<br>**Blood group if known***:* |
| **Emergency management given at _____am/pm.** | *Brief summary of emergency management given* | |
| **Any other comments:** | | |

| | | |
|---|---|---|
| **Patient's name** | *Address:* | |
| **Name and designation of person making the referral** | *Address:* | |
| **Date and time when patient first seen** | | |
| **Past history** | | |
| **Present problem** | | |
| **Management** | | |
| **Main reason(s) for referral** | | |
| **Date/time of arrival at health centre** | | |
| **Condition at time of arrival at health centre** | | |
| **Blood Pressure:** | **Fetal heart rate***:* | **Bleeding***: Yes/No*<br>**Blood group if known***:* |
| **Emergency management given at _____am/pm.** | *Brief summary of emergency management given* | |
| **Any other comments:** | | |

# 7 LEARNING CLINICAL SKILLS

# SESSION 7
# LEARNING CLINICAL SKILLS

**Aims**

- To enable students to become competent and confident in using the clinical skills which are essential to managing obstructed labour.

**Objectives**

On completion of Session 7, students will be able to:

- Identify in practice the factors which place a woman at increased risk of obstructed labour. Explain why there is a risk, and how risk may be reduced.
- Assess the pelvic outlet.
- Diagnose the presentation and position of the fetus by abdominal examination (Leopold's manoeuvres) and by vaginal examination.
- Assess descent of the fetal head.
- Demonstrate with reference to history, records and clinical findings, how to recognize obstructed labour.
- Demonstrate the technique of urinary catheterization, illustrating the importance of aseptic technique, gentle handling and sensitivity in approach.*
- Demonstrate the ability to take blood samples for analysis, filling in the appropriate laboratory request forms.*
- Demonstrate the ability to set up and monitor an intravenous infusion, stating the reasons for doing so, the precautions to be taken and the records to be kept.*
- Explain the prescription, ordering, storage and administration of drugs, and demonstrate the ability to administer the necessary drugs.*
- Describe the importance of adequate fluid intake and demonstrate the use of a fluid balance sheet.*
- Demonstrate the procedure of episiotomy and repair.*
- Demonstrate the ability to maintain accurate records.*

**Plan**

Modified lecture (2 hours).

Clinical teaching (2 hours per small group of students per skill, as well as a realistic period of time for assessment of competence in each skill).

**Resources**

Managing complications in pregnancy and childbirth: a guide for midwives and doctors. Geneva, World Health Organization, 2003 (WHO/RHR/00.7).

* These objectives may already have been achieved by students who have completed the postpartum haemorrhage module.

## INTRODUCTION

*The clinical skills in this session constitute a critical component of the module. In teaching these skills, you may wish to collaborate with another midwifery teacher, a practising midwife or an obstetrician. Whilst learning these skills, students should have consistent supervision.*

*Each skill is organized under three headings:* ***Teaching methods****;* ***Teaching content****; and* ***Assessing competence****. While it is important for the teacher to use the information included under each of these headings, it is particularly critical to carefully follow the guidelines for assessing competence in each of the skills. It may, therefore, be helpful to extract these guidelines and develop a checklist, which should include a space for the comments of both the teacher and the student, for each of the skills. Copies of the checklists could then be used for each student being assessed.*

*Remind students that the infection prevention practices described with respect to managing prolonged and obstructed labour (Session 6) apply to the skills in this session.*

## SKILL: IDENTIFYING RISK FACTORS FOR OBSTRUCTED LABOUR

### Teaching method

1. *Introduce teaching content to students.*

2. *Divide the students into small groups.*

3. *Take them into the clinical area, which may be an antenatal clinic, an antenatal ward or a labour ward.*

4. *Ask the students to select a woman who has not yet delivered. After obtaining permission from the midwife responsible for care, the woman herself and her relative(s) if appropriate, students should read the woman's history recorded in the case notes. They should talk with the woman in order to clarify or update any details in her record and should carry out a full clinical examination of her.*

   *As they do this, students should identify factors which place the woman at increased risk of obstructed labour.*

5. *Check the findings of the students at the bedside.*

### Teaching content

Important risk factors for obstructed labour can be identified by taking a proper history on every woman during antenatal care. The following risk factors can be identified during history taking:

- young teenager
- previous history of rickets, osteomalacia, tuberculosis, poliomyelitis, pelvic injury
- previous caesarean section or still birth
- previous prolonged labour.

Other risk factors are identified by physical examination:

- short stature (height <150 cm may be associated with a small pelvis
- abnormal gait, which may be caused by disease or injury affecting the pelvis
- small or abnormally-shaped pelvis, identified by vaginal examination
- abnormal presentation or position of the fetus
- fetal head not engaged at term in primigravida, or cannot be made to engage (only 2/5 palpable above pelvic brim)
- very large baby
- evidence of genital mutilation.

## Assessing competence

*Students should have identified the factors that place the woman at increased risk of obstructed labour. Use the checklist from Session 2, as a guide.*

*In checking students' understanding, ask them:*

- *Why does this factor make obstructed labour more likely or more dangerous?*

*In order to confirm that a student is competent, the answer to these questions must be yes.*

1. *Is the student able to recognize the risk factors*
   - *from the written records?*
   - *from her/his own history taking?*
   - *from clinical examination?*
2. *Can the student explain why there is a risk?*
3. *Does the student know what must be done in order to make sure that the risk is avoided or reduced?*

## SKILL: ASSESSING PELVIC OUTLET

**Teaching method**

*This skill can be taught during the same visit to the clinical area as for the previous skill.*

**Teaching content**

*Palpation of the abdomen should always be undertaken prior to vaginal examination to assess uterine size and/or fetal position, if applicable.*

**How to do a vaginal examination***

The woman should lie down on her back, bend and open her knees. Swab the external genitalia with an antiseptic solution. Wash hands thoroughly and put sterile gloves on. Separate the labia with two fingers of the left hand. Dip the examining fingers (index and middle fingers) into an antiseptic lubricating cream and insert them very gently into the vagina, following the direction of the vagina, upwards and backwards. Ask the woman to take deep breaths and try to relax as this will help decrease the discomfort of the procedure.

**Assessment of the pelvic outlet**

On vaginal examination the ischial spines are palpated. Normally the spines stick out only slightly. If they stick out a lot, this indicates a small pelvic outlet. During the same examination, the shape of the sacrum can be felt. Normally it is smooth and curves backwards. A straight sacrum or one with a sharp hook is abnormal. Before removing the fingers, the pubic arch can be examined to see whether it is wide enough. Two fingers can usually be accommodated in the apex of the pubic arch.

The wideness of the pubic arch can also be assessed externally by placing the thumbs under the arch (see **Figure 7.1** for position of hands). If the arch cannot easily accommodate the two thumbs, this means that the pubic arch is not wide enough and the fetal head might not be able to pass through.

**Assessing competence**

In order to confirm that a student can assess a woman's pelvic outlet, the answer to these questions should be yes.

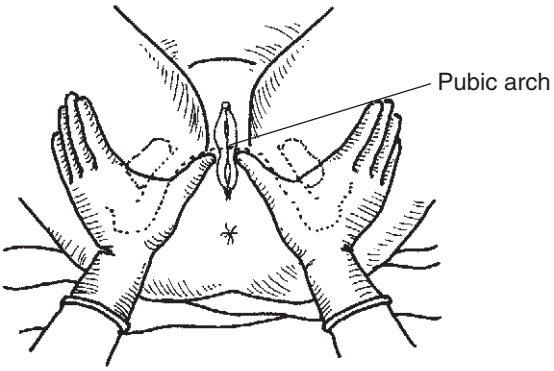
1. *Can the student assess the pelvic capacity of the outlet by palpating the ischial spines on vaginal examination, feeling the shape of the sacrum and by assessing the wideness of the pelvic arch?*

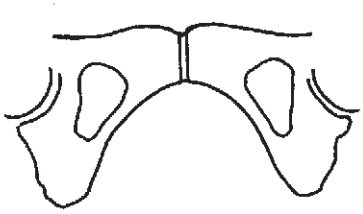
2. *Does the student explain clearly and correctly the significance of the findings?*

3. *Does the student explain to the woman what she is doing and does she examine the woman gently?*

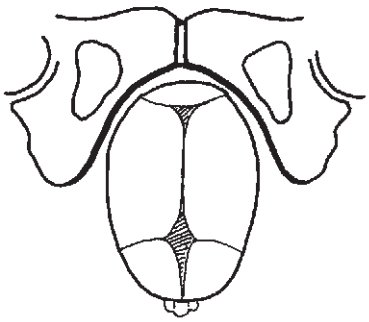
   *It should be noted that the best way to determine if a pelvic is adequate is a trial of labour. Clinical pelvimetry is of limited value.*

* Ensure that vaginal examinations are carried out only when indicated clinically, and never for teaching or assessing purposes only.

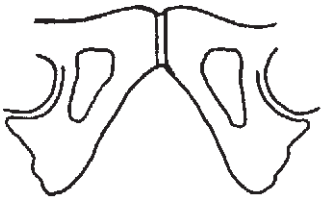


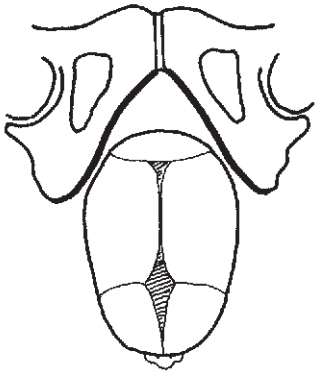
Normal pubic arch



Fetal head fits into pubic arch



Narrow pubic arch



Fetal head does not fit into pubic arch and is forced backwards on the perineum

**Figure 7.1:** Estimating the width of the pubic arch

## SKILL: DIAGNOSING PRESENTATION AND POSITION OF THE FETUS

*This skill consists of three parts:*

1. *Identification of landmarks of the fetal skull.*

2. *Diagnosis of fetal presentation by abdominal examination (Leopold's manoeuvres).*

3. *Diagnosis of fetal presentation by vaginal examination.*

*The amount of time spent by the teacher to teach each part will depend on students' previous knowledge on each skill.*

### Teaching method

*For this part of the session the teacher will need to use the following anatomical models:*

- *model of maternal pelvis (may be made of cardboard - see Session 1)*
- *model of fetal skull (the skull should have two sunken areas for the fontanelles)*
- *fetal doll.*

*In order to allow students to carry out the practical exercises, it is helpful to have several models available.*

*Abdominal examination (Leopold's manoeuvres) can be demonstrated on a woman in a labour ward who has not yet delivered.*

*Follow up each student in the clinical situation. Carry out clinical teaching.*

- *history taking*
- *abdominal palpation during labour*
- *vaginal examination during labour**
- *use and interpretation of partograph.*

### Teaching content

#### Landmarks of the fetal skull

Remind students of the position of the fontanelles, sagittal suture, vertex, occiput and sinciput on the fetal skull (**Figure 7.2**, and **Figure 7.3**).

The posterior fontanelle is situated in the back part of the baby's head and helps to identify the occiput. It is smaller than the anterior fontanelle and is bounded by three sutures (triangular in shape).

* Ensure that vaginal examinations are carried out only when indicated clinically, and never for teaching or assessing purposes only.

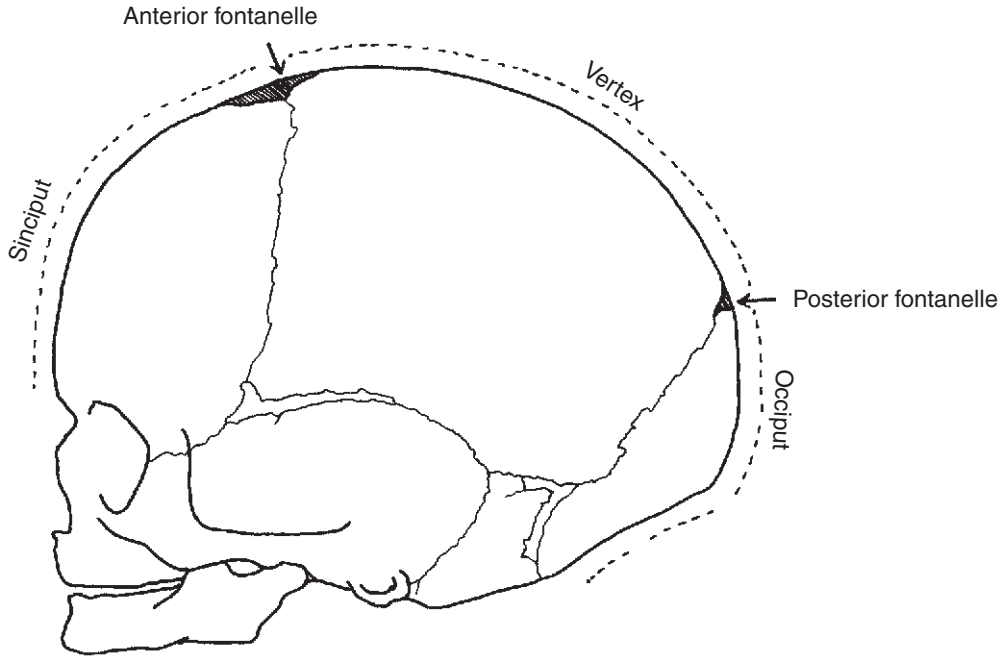



**Figure 7.2:** Important landmarks of the fetal skull

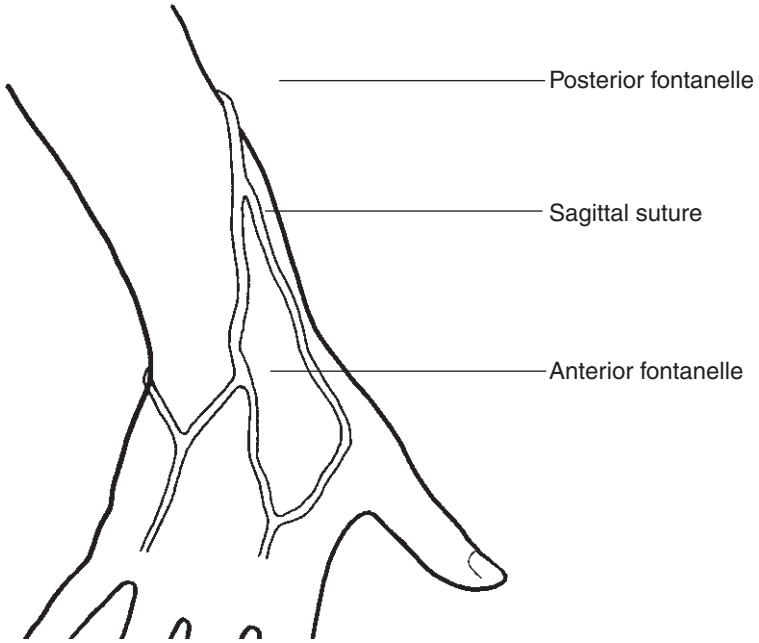



**Figure 7.3:** Vertex area of fetal skull showing sutures and fontanelles

The anterior fontanelle is on the front part of the head and is bounded by four sutures (diamond-shaped). It is larger than the posterior fontanelle.

The sagittal suture goes from the posterior fontanelle to the anterior fontanelle.

The occiput is the part at the back of the baby's head that lies between the posterior fontanelle and the neck.

The vertex is the part of the top of the head that lies between the two fontanelles.

The sinciput is the part of the head in front of the anterior fontanelle and it includes the forehead.

**Diagnosis of presentation by abdominal palpatation (Leopold's manoeuvres)**

Ask the woman to first empty her bladder and then to lie down on her back with only her abdomen exposed. Wash your hands and explain to the woman what you are going to do.

***First manoeuvre***: Leopold's manoeuvres determine the fundal height and this is compared with the expected date of delivery to assess whether the size of the uterus is appropriate for the period of gestation. The size may be correct for gestational age, too small or too large. If too small the commonest reasons are that the dates may be wrong, or the fetus may not be growing adequately (intrauterine growth retardation IUGR). If the uterus is large for dates, the commonest reason is again incorrect dates, or there may be a multiple pregnancy or a very large fetus.

To assess the fundal height, outline the upper contour of the uterus and then gently palpate the fundus (i.e. the top) of the uterus with the side of one or two hands. The gestational age can be assessed by two methods. One is by measuring the distance from the upper border of the symphysis pubis to the fundus with a tape measure. In the latter weeks of pregnancy the symphysial-fundal measurement should be the same as the number of weeks gestation. The other method is by relating the fundus to certain landmarks which are visible or palpable on the abdomen. These landmarks are the upper border of the symphysis pubis, the umbilicus and the xiphisternum, i.e. the tip of the sternum. After about 34 weeks the relevant landmark is the xiphisternum and the distance between the top of the fundus and the xiphisternum is measured with fingers widths which are placed horizontally on the abdomen. At 36 weeks the fundus is normally right up to the xiphisternum, thus no fingers can be accommodated. After this time, however, when the head becomes engaged, the fundal height drops a little and 2–3 fingers can again be accommodated.

The manoeuvre also helps determine the fetal part occupying the fundus (**Figure 7.4**). The fetal breech feels large and nodular whereas the head feels hard and round and is more freely movable.

***Second manoeuvre***:
The second manoeuvre helps to determine the position of the fetal back and the fetal limbs. Normally the fetal back will be felt clearly on the right or left of the abdomen. If the back is on the left, the occiput will also be on the left, and vice versa, therefore this manoeuvre help to determine the fetal position.

Palms of the hands are placed on each side of the abdomen and gentle pressure is applied (**Figure 7.4**) with one hand while the other hand is used to steady the uterus and to press the fetus towards the examining hand. This is done alternating the hands. It will allow the examiner to feel on one side a hard, smooth, curved area which will indicate the back of the fetus. On the other side numerous small parts are felt which indicate the fetal limbs.

**Note**: If the fetus is in a posterior position (**Figure 7.5**), the back cannot be felt. The small parts can be felt anteriorly. Fetal heart sounds are more difficult to hear, too.

This manoeuvre also helps to determine whether the fetus lies in a longitudinal or transverse position.

***Third manoeuvre***:
The purpose of this manoeuvre is to determine the presentation, i.e. the part of the fetus which is lowest in the uterus.

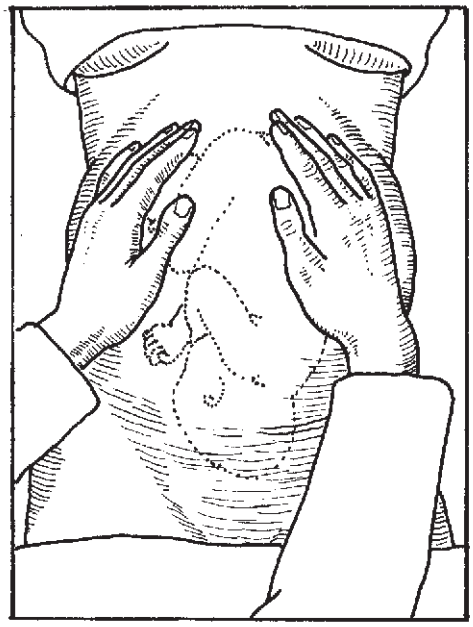
The examiner turns to face the woman's feet, places the fingers on each side of the abdomen just above the level of the symphysis pubis and exerts gentle but deep pressure to locate the presentation. Usually the hard round contours of the head will be felt, but it is important to check carefully for breech presentation because labour is likely to be more complicated in these cases. A hard round head may be felt in the fundus and the softer, less rounded breech could be in the pelvis.

If the presenting part is engaged, it cannot be moved and details are included in the next paragraph.

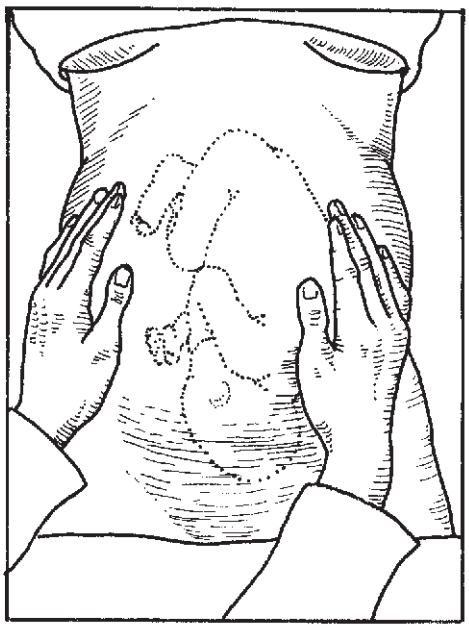
***Fourth manoeuvre***:
Using the thumb and fingers of one hand, grasp the lower portion of the abdomen just above the symphysis pubis.

If the presenting part is not engaged, a movable structure will be felt, usually the fetal head, which will feel hard and round. In contrast, the breech feels large, soft and irregular.

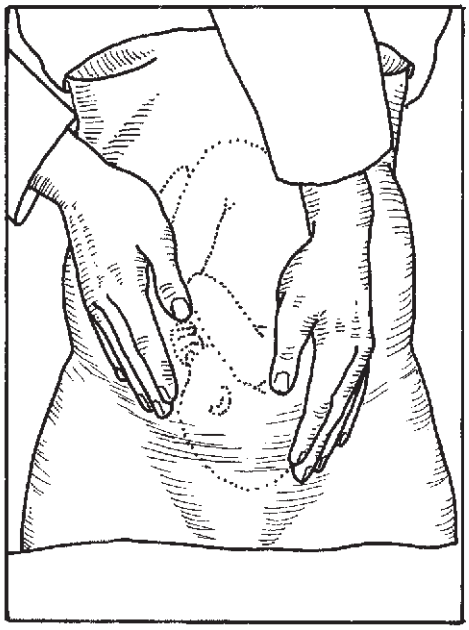
If the presenting part is engaged, it cannot be moved and details are included in the next paragraph.



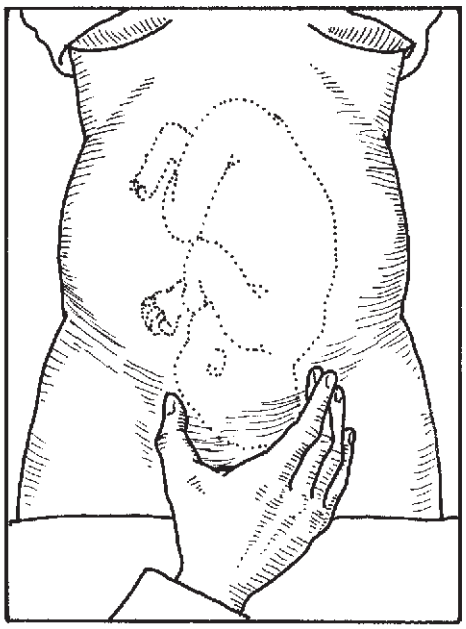
**First** manoeuvre



**Second** manoeuvre



**Third** manoeuvre



**Fourth** manoeuvre

**Figure 7.4:** Leopold's manoeuvres: palpation of fetus in **left** occiput anterior position

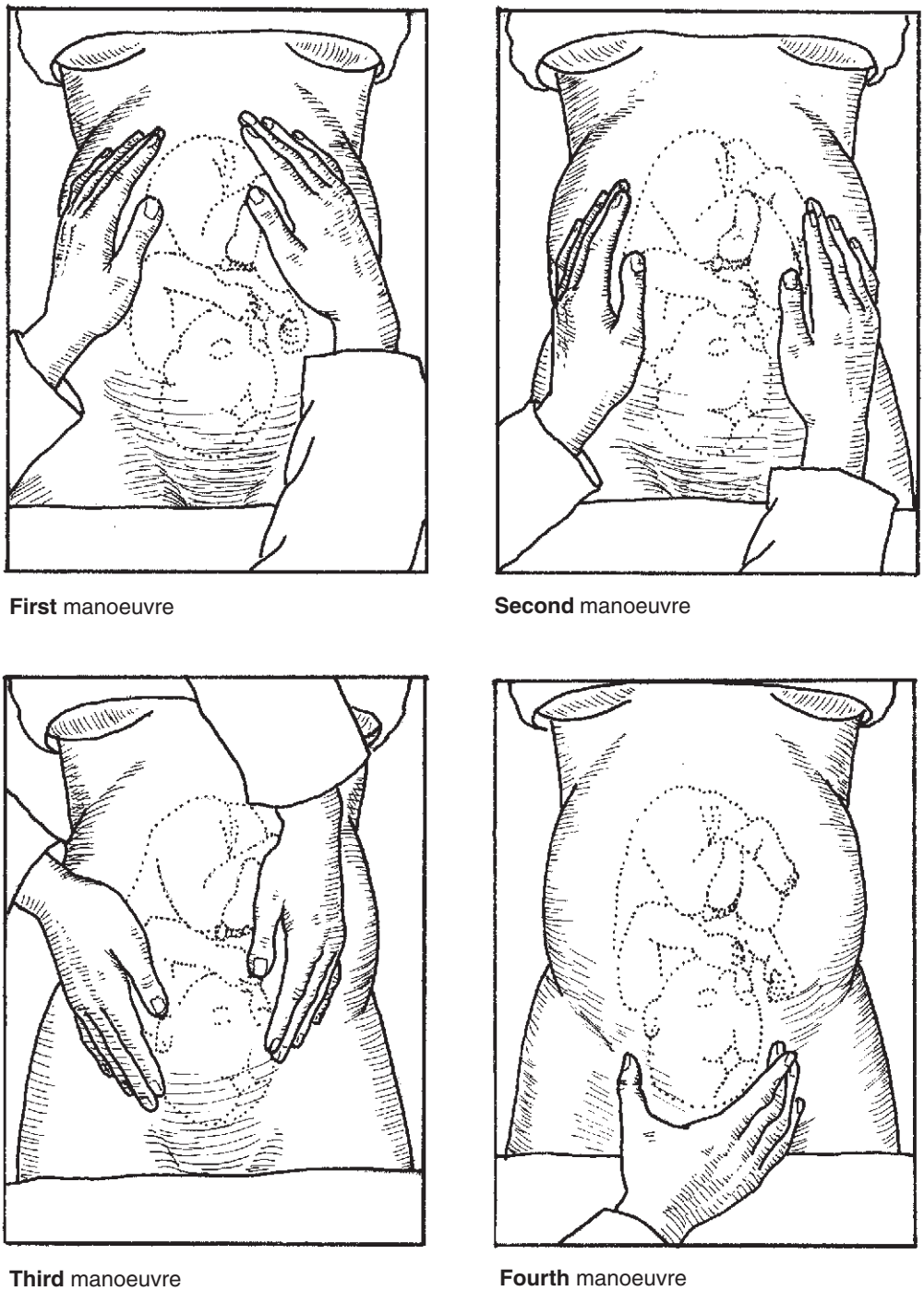



**Figure 7.5:** Leopold's manoeuvres: palpation of fetus in **right** occiput anterior position

***Descent of the head***: (as in **figure 4.3**, Session 4) Descent of the head is estimated in fingers widths. If all 5 fingers can feel the fetal head when placed horizontally on the abdomen, just above the level of the symphysis pubis, the head is 5/5ths palpable, i.e. very high and has not started to enter the pelvis. The head is said to be engaged when only 2/5ths of the head is palpable, because the widest transverse diameter has entered the pelvis.

**Auscultation of the fetal heart**

The final part of the examination is auscultation of the fetal heart. The fetal heart rate normally ranges between 120–160 bpm, but if under 100 or above 180, significant fetal distress is likely and action should be taken.

**Diagnosis of presentation by vaginal examination**

*Emphasize again the need for strict hygienic technique. This is important in the prevention of sepsis.*

*Emphasize the importance of carrying out a general examination on the woman on admission. The abdominal examination must always be conducted before vaginal examination.*

*Explain the diagnostic points which are helpful in distinguishing between head and breech and face presentations.*

*Using **Figure 7.6**, **Figure 7.7** and **Figure 7.8** emphasize the similarity and difference on vaginal examination between:*

- *sagittal suture and anal cleft*
- *ischial tuberosities and malar bones*
- *mouth and anus.*

Helpful things to remember:

- head is larger and harder than breech
- mouth can be distinguished from anus because
  - baby may suck examining finger
  - gums are hard
  - lips do not grip like a sphincter, and
  - anus may leave meconium staining on finger.

Correct and prompt diagnosis can prevent complications.

It is important to be able to distinguish a hand from a foot. Compare **Figure 7.9** with **Figure 7.10** and note:

- the large toe will not abduct like the thumb
- the toes are the same length but the fingers are not.

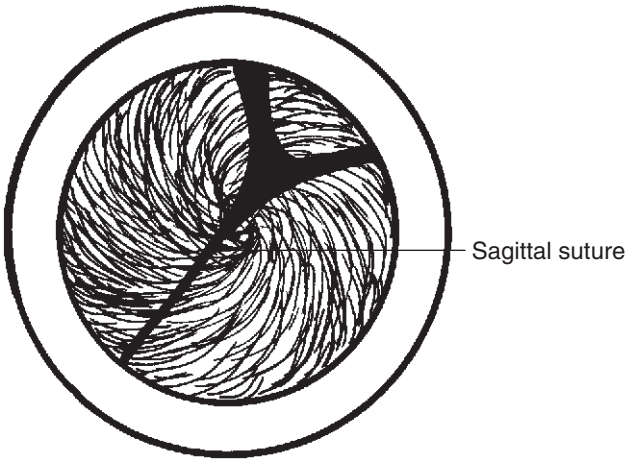



**Figure 7.6:** Head presentation

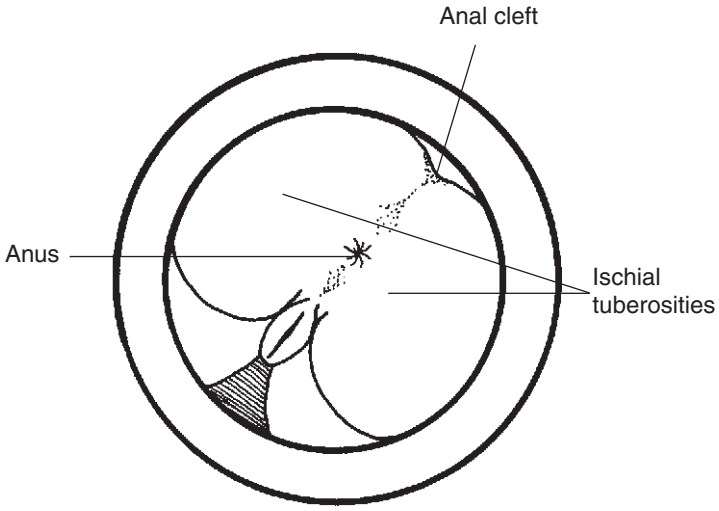



**Figure 7.7:** Breech presentation

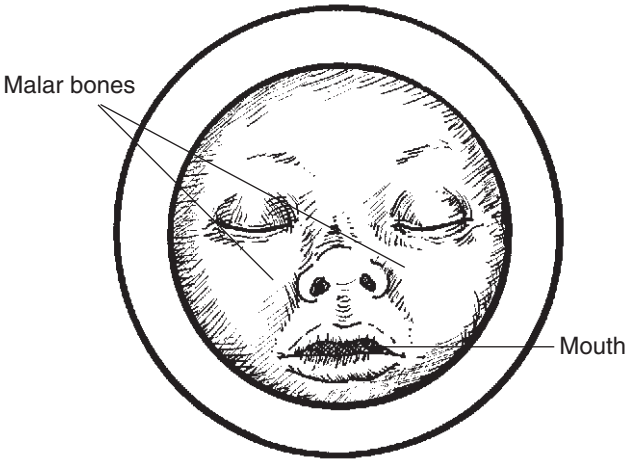



**Figure 7.8:** Face presentation

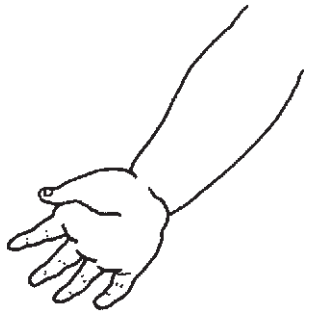


**Figure 7.9:** Hand presentation

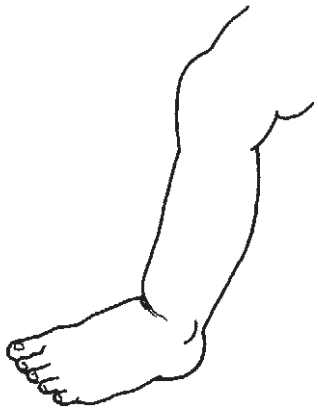


**Figure 7.10:** Foot presentation

A hand indicates a transverse lie which will cause obstructed labour if correct management is not given in time. A foot indicates a breech presentation and if other aspects of labour are favourable will allow vaginal delivery.

The elbow must be differentiated from the knee. If **Figure 7.11** is compared with **Figure 7.12**, note that:

- the tip of the humerus is more pointed
- the patella has no equivalent in the elbow joint.

An elbow indicates a transverse lie which will cause obstructed labour if correct management is not given in time. A knee indicates a breech presentation and if other aspects of labour are favourable will allow vaginal delivery.

**Figure 7.11:** Humerus feels pointed

**Figure 7.12:** Patella feels rounded

**Determining position in head (or cephalic ) presentation**

*During the course of labour, students should be able to identify by vaginal examination the position of the fetal head and relate this to how well labour is progressing, in order to determine whether or not spontaneous labour can be expected. The following text and practical exercises can be used to teach students this skill.*

*In vertex presentation (leading part is the occiput), the occiput can be felt in six different positions in relation to the pelvic inlet (**Figure 7.13**).*

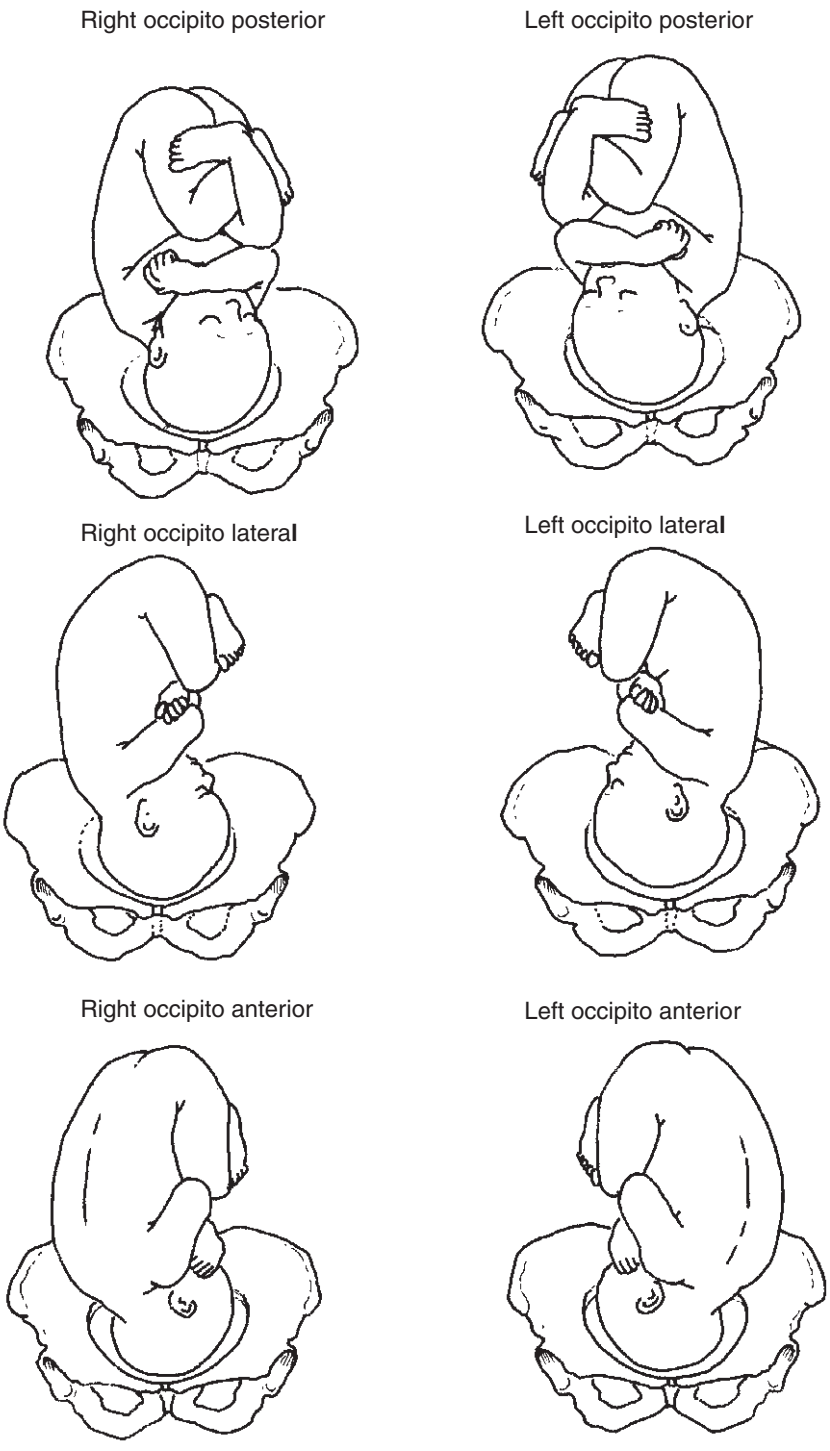



**Figure 7.13:** The six vertex positions

If the occiput points to the right posterior area of the inlet, the position is called right occipito posterior.

If the occiput points to the right lateral area of the inlet, the position is called right occipito lateral.

If the occiput points to the right anterior area of the inlet, the position is called right occipito anterior.

Similarly on the left, the positions of the occiput can be left occipito posterior, left occipito lateral, and left occipito anterior according to the area of the pelvis the occiput points to.

In summary, the six positions of the occiput as the fetal head enters the pelvic inlet are:

| | |
|---|---|
| ROP = right occipito posterior | LOP = left occipito posterior |
| ROL = right occipito lateral | LOL = left occipito lateral |
| ROA = right occipito anterior | LOA = left occipito anterior. |

The relative frequency of these six positions are:

| | |
|---|---|
| ROP = 8 | LOP = 3% |
| ROL = 24% | LOL = 40% |
| ROA = 10% | LOA = 15%. |

The directions Right (**R**), Left (**L**), Posterior (**P**) and Anterior (**A**) are all relative to the mother (**Figure 7.14**).

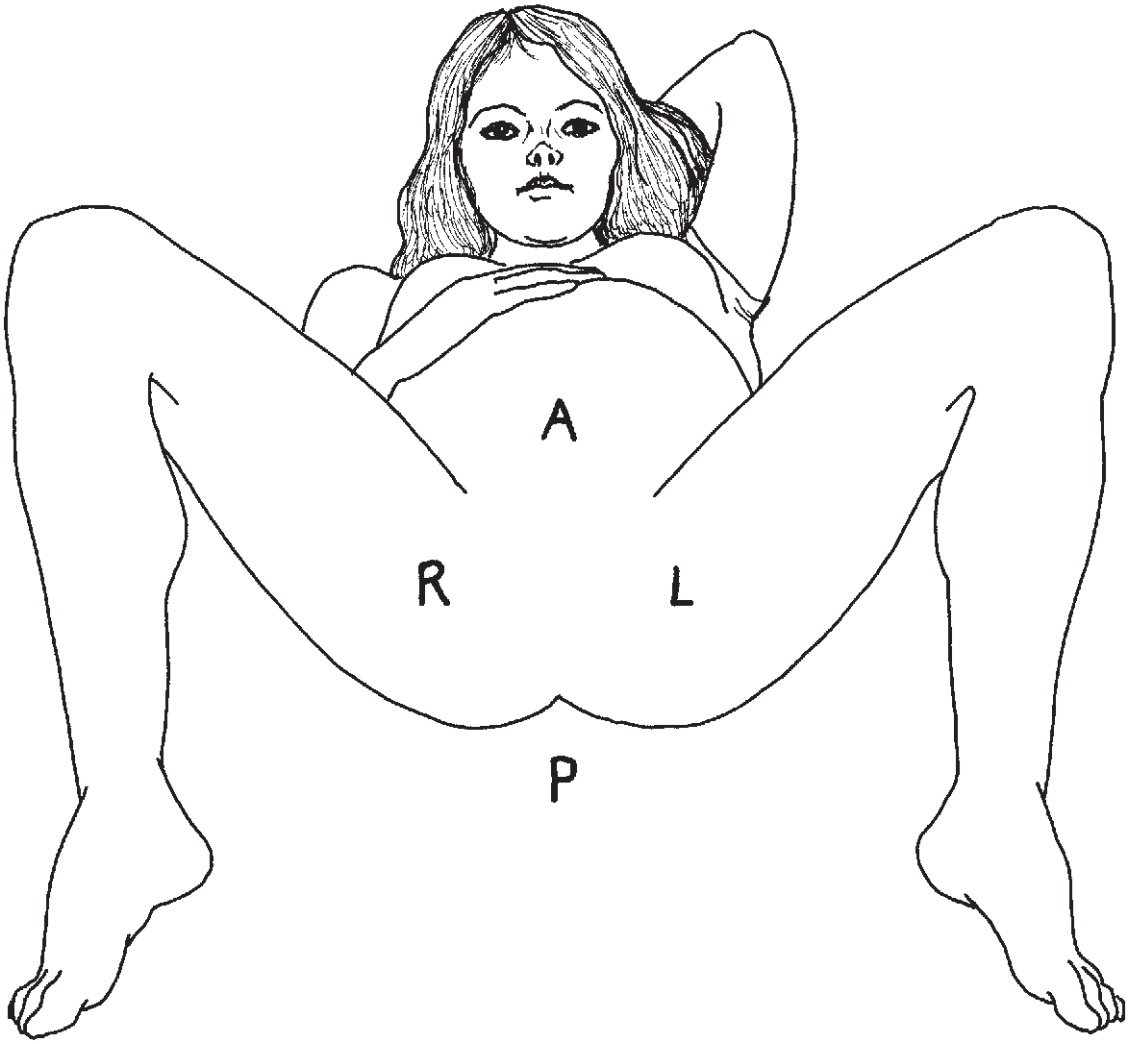



**Figure 7.14:** The directions: Right (R), Left (L), Posterior (P), relative to the mother

***Anterior versus posterior positions**:*

*Explain to the students why anterior positions are more favourable than posterior positions.*

When the fetus is in an occiput anterior position, the fetal back is in front, it fits the shape of the mother's abdominal wall and can therefore flex more easily. When the back is flexed, the head also tends to flex and a smaller diameter engages in the pelvis. The head fits well into the lower uterine segment and exerts even pressure on the cervix, stimulating good uterine contractions and facilitating dilatation. (**Figure 7.15**). During the birth, the smallest diameters stretch the birth canal and perineum, thereby causing minimal trauma to the mother and to the fetal brain.

In contrast, when the fetus is in an occiput posterior position, the fetal back is against the mother's spine and cannot flex very well. The head sometimes stays unflexed and therefore larger diameters

of the fetal skull attempt to pass through the pelvis. This may result in delay in the head becoming engaged. The irregular shape of the larger presenting diameters of the fetal head exerts uneven pressure on the cervix and therefore contractions may be less effective and cervical dilatation slower.

In most cases the fetal head flexes and rotates to an anterior position on the pelvic floor and delivery is normal but, when the head remains deflexed, it rotates to a posterior position and the birth is more difficult. This is because larger diameters of the fetal head distend the birth canal and stretch the pelvic floor, therefore progress is slower and tears are more likely. The compression of the fetal skull, if excessive or prolonged, may cause intra-cranial injury.

Other complications of occipito-posterior positions are less common, but more serious. If rotation of the head is held up on the ischial spines, it may become stuck and delivery is not possible until assistance is given to rotate and deliver the head using a vacuum extractor or special obstetric forceps. In other cases the head may extend rather than flex and become a brow presentation or, if further extension takes place, a face presentation. A brow presentation leads to obstructed labour and so urgent referral to a higher level health facility is required for operative delivery. An anterior face presentation can be delivered vaginally, but should be assisted by a skilled practitioner to minimize trauma to mother and baby.

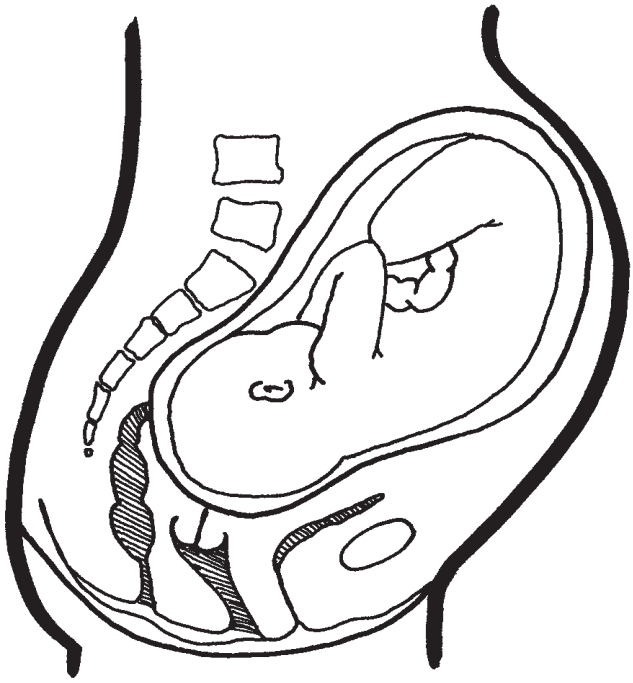


**Figure 7.15:** Vertex presentation anterior position. Head well flexed, fetal back conforms to maternal abdominal wall, flexion thus being facilitated

## HOW TO DETERMINE THE POSITION OF THE FETAL HEAD IN THE PELVIS

The position can be detected by the location of the sagittal suture and the fontanelles.

In an occipito-anterior position the sagittal suture will be in the right or left oblique diameter of the pelvis and the POSTERIOR fontanelle in the ANTERIOR part (front) of the pelvis. In a posterior position the sagittal suture will again be in the right or left oblique diameter of the pelvis, but the ANTERIOR fontanelle will be felt ANTERIORLY in the pelvis.

**LOA POSITION**.
When the sagittal suture is in the right oblique diameter of the pelvis (i.e. from the right posterior (back) section of the mother's pelvis to the left front of her pelvis)) and the POSTERIOR fontanelle is felt at the front to the left, position is LEFT-OCCIPITO-ANTERIOR.

**ROP POSITION**
If the sagittal suture is felt in the right oblique diameter of the pelvis and ANTERIOR fontanelle is in the front, the position is RIGHT-OCCIPITO-POSTERIOR.

**ROA POSITION**
In a RIGHT-OCCIPITO-ANTERIOR position, the sagittal suture is in the left oblique diameter of the pelvis and the POSTERIOR fontanelle is in the front on the right.

**LOP POSITION**
In a LEFT-OCCIPITO-POSTERIOR position, the sagittal suture is in the left oblique diameter of the pelvis and the ANTERIOR fontanelle is in the front to the right.

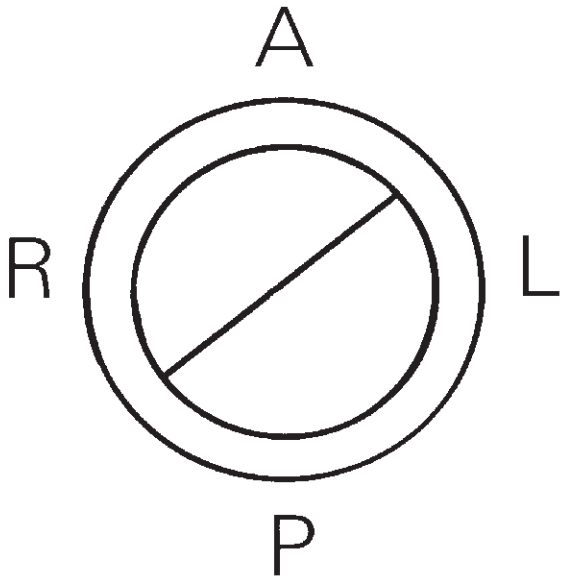



**Figure 7.16:** Right oblique diameter

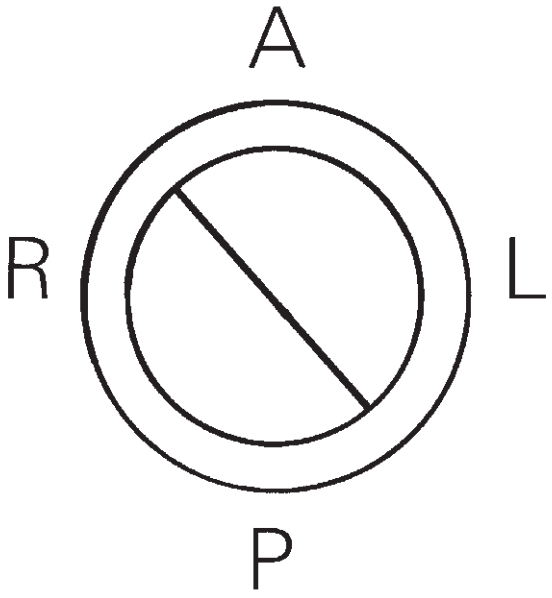



**Figure 7.17:** Left oblique diameter

***Left occiput anterior position:***
*The following steps explain how to draw the fetal head in the left occipito anterior position. Use the drawing to explain to students how to recognize the left occipito anterior position.*

**Step 1:**

*Draw the cervix like this (**Figure 7.18**) and mark: anterior (A) posterior (P) right (R) and left (L). (Remind the students that these positions are all relative to the mother - refer back to **Figure 7.13**).*

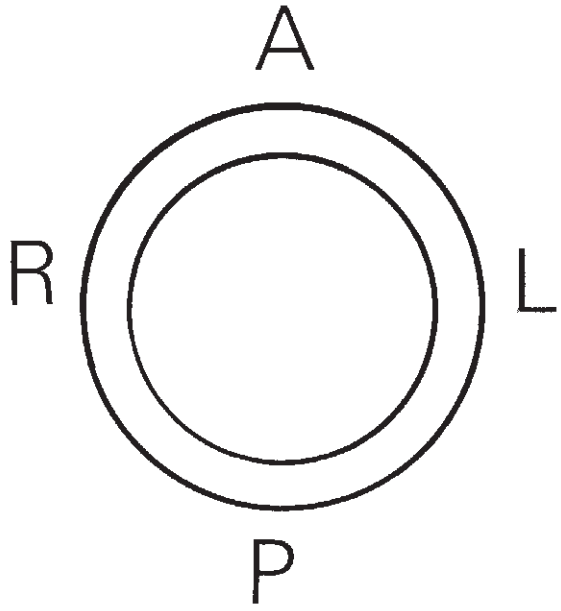



**Figure 7.18:** Labelling the positions on the diagram

**Step 2:**

*On the diagram, draw the sagittal suture and posterior fontanelle as it ill be in the left occipito anterior position. Demonstrate this by placing a fetal skull or doll in a model pelvis in the LOA position (**Figure 7.19**).*

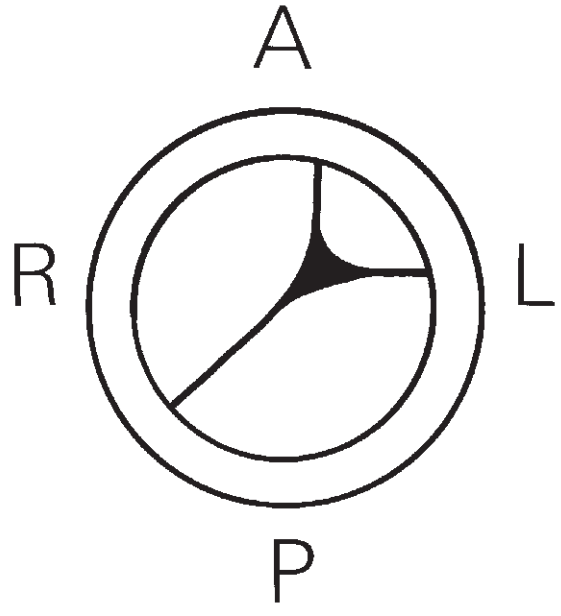



**Figure 7.19:** Sagittal suture and posterior fontanelle in left occipito anterior position

**Step 3:** *Label the occiput on your diagram.*

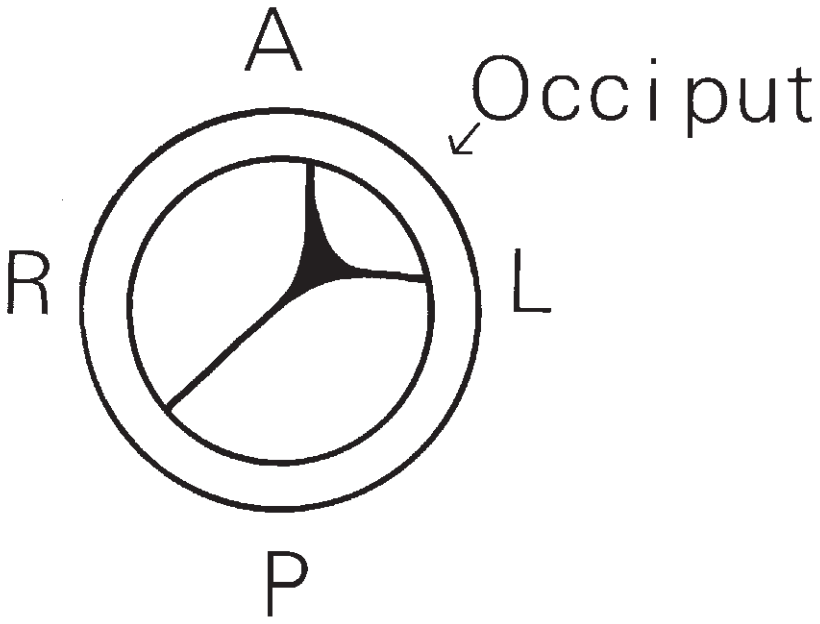



**Figure 7.20:** Labelling the occiput on the diagram

**Step 4:** *Underline or use a coloured chalk to mark the letters L, O and A on the diagram. Remind students that this is a Left Occipito Anterior position.*

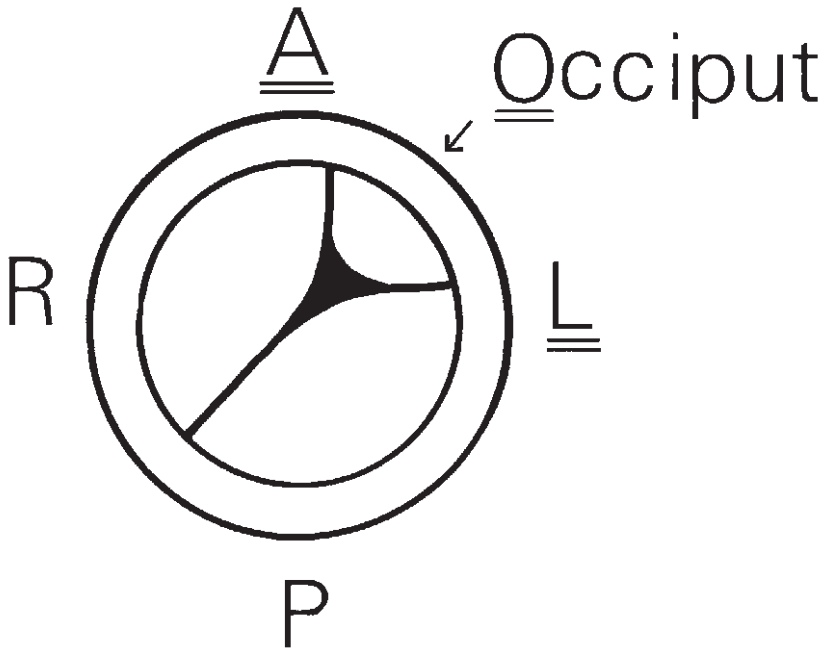



**Figure 7.21:** Left Occipito Anterior position

*Explain to students that the occiput is always in the same area as the posterior fontanelle. Show them on a fetal skull or doll, or even their own heads, the position of the posterior (small) fontanelle.*

*Teach students to describe what they see. They must be able to describe what they feel and write it in the record.*

*The posterior fontanelle is to the left, anteriorly (or in the front).*

*The sagittal suture is in the right oblique diameter of the pelvic outlet.*

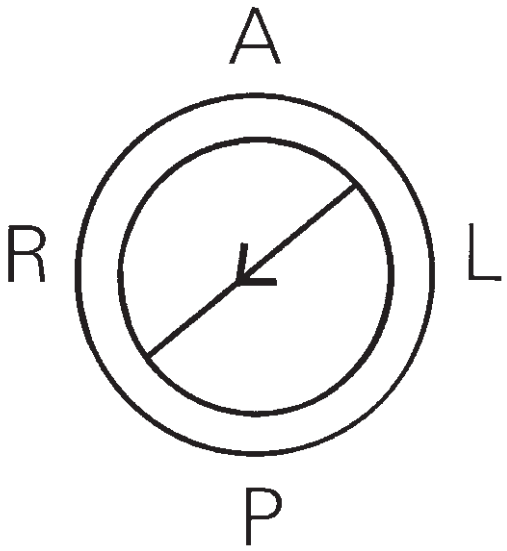



**Figure 7.22:** Right oblique diameter

*Build up diagrams for the other positions (**Figure 7.23** to **Figure 7.27**) so that students become familiar with labelling the directions and identifying the sutures and fontanelles. Make sure that students understand each step.*

*On the following pages, only the final/complete diagram for the positions discussed earlier (ROA, LOP, ROP, ROL, LOL) is given. Instruct students to build up each diagram in stages as with the LOA position.*

**Example: Right Occipito Anterior**

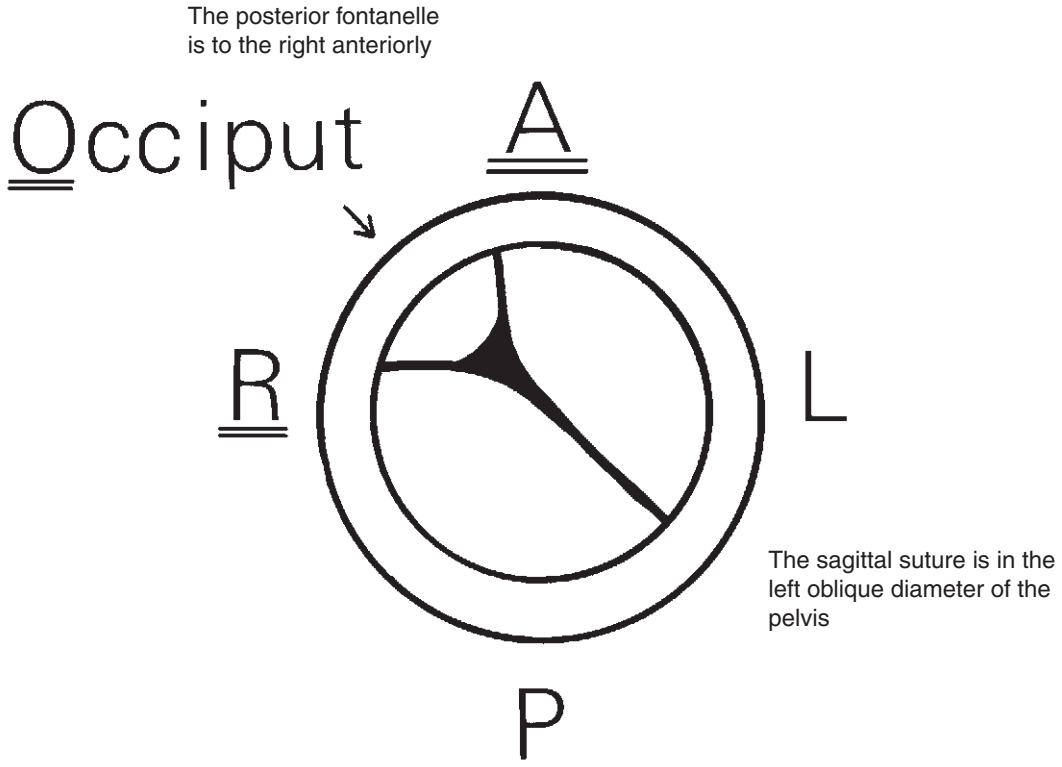



**Figure 7.23:** Right occipito anterior position

### Example: Left Occipito Posterior

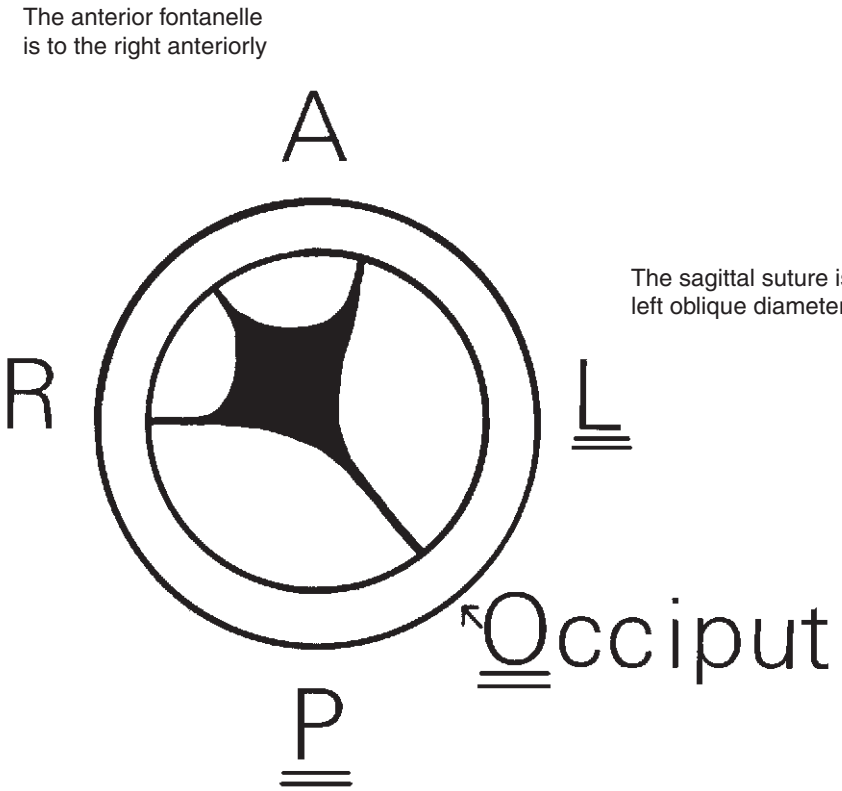



**Figure 7.24:** Left occipito posterior

### Example: Right Occipito Posterior

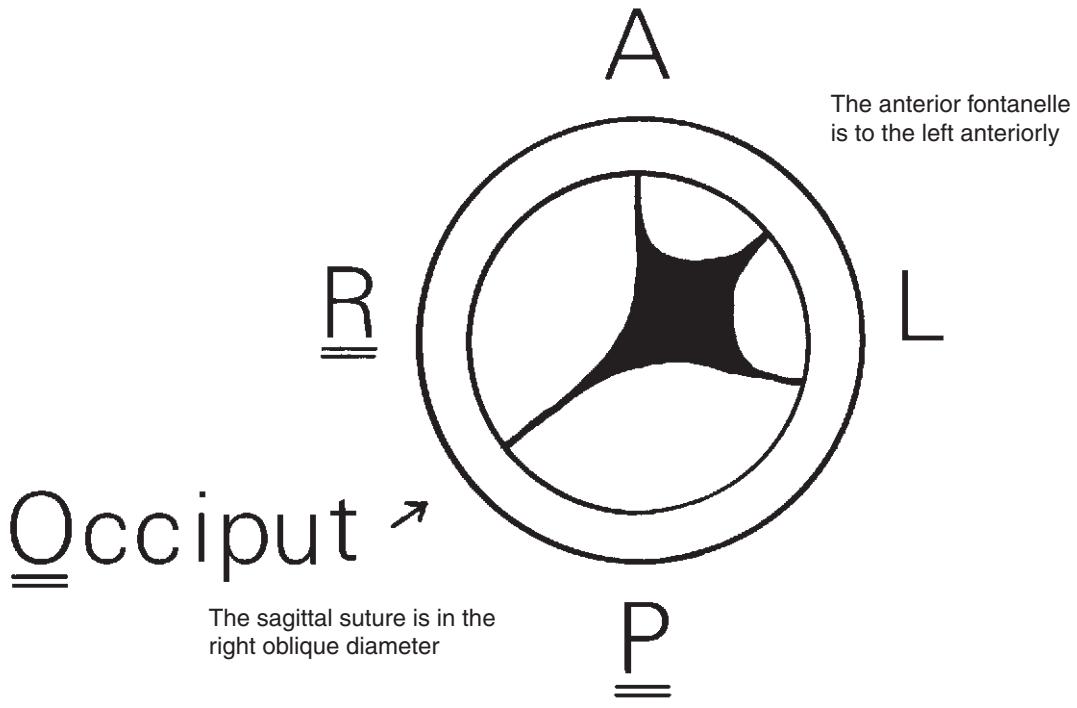



**Figure 7.25:** Right occipito posterior

**Example: Right Occipito Lateral**

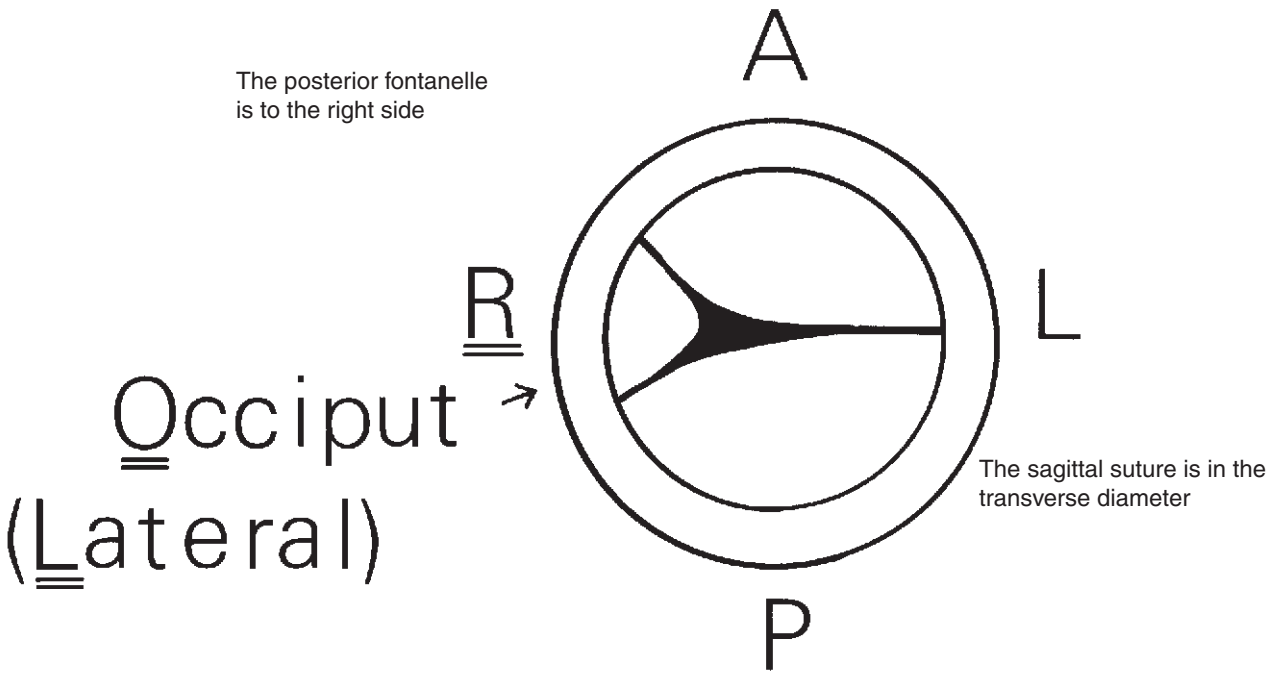



**Figure 7.26:** Right occipito lateral

**Example: Left Occipito Lateral**

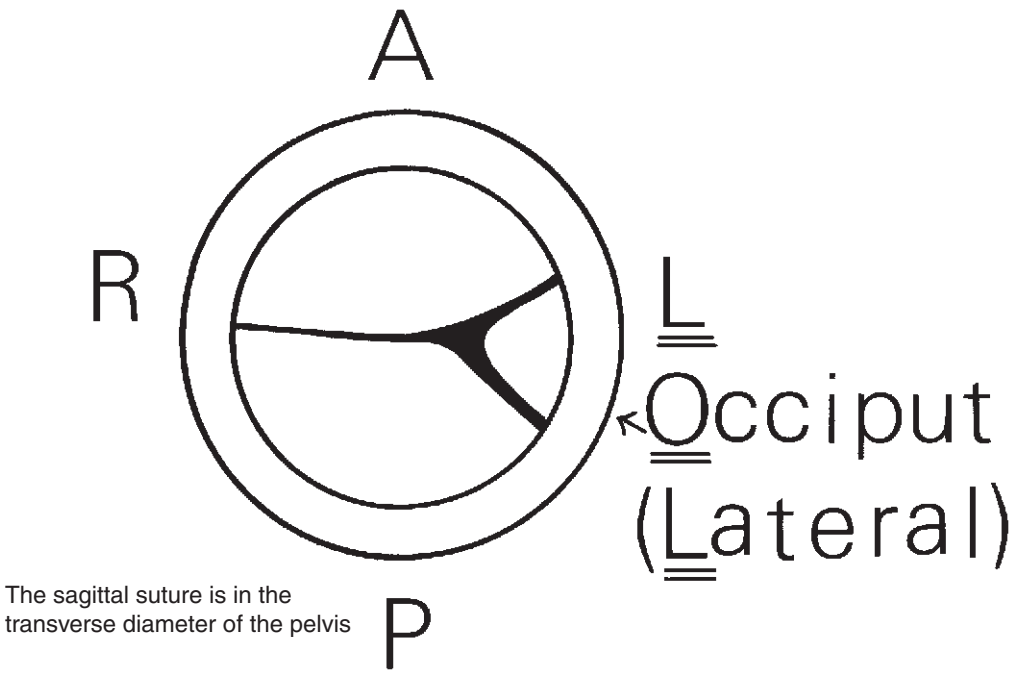



**Figure 7.27:** Left occipito lateral

**Practical Exercises**

*Ask students to work in pairs. One student closes their eyes and uses only the two fingers which she would use for vaginal examination. The second student places a model of a fetal skull inside a pelvic model in one of the six positions of the occiput: LOA, ROA, LOP, ROP, LOL or ROL. When ready, she should guide the first student's hand into the pelvis.*

*While waiting for their turn, other students can watch and check if the student has placed the fetal skull correctly.*

**Assessing competence**

*In order to confirm that a student can diagnose the presentation and position of a baby, the answer to the following questions should be yes:*

1. *Can the student identify landmarks of the fetal skull (fontanelles, sagittal suture, vertex, occiput and sinciput)?*

2. *Can the student determine the presentation and position of the baby and the extent to which the presenting part has descended into the pelvis by abdominal palpation (Leopold's manoeuvres)?*

3. *Can the student state the diagnostic points which are helpful in distinguishing between head, breech and face presentation by vaginal examination?*

4. *Can the student state the diagnostic points which are helpful in distinguishing between breech and transverse lie by vaginal examination?*

5. *Is the student able to determine the position of the head by vaginal examination?*

## SKILL: ASSESSING DESCENT OF THE FETAL HEAD

**Teaching method**

*Teach this skill in clinical practice in a labour ward. Ask the students to assess the descent of the fetal head on women in labour, and check their findings.*

**Teaching content**

*The descent of the fetal head is assessed first by abdominal palpation, and then by bi-manual palpation with one hand palpating the lower abdomen, and two fingers in the vagina to feel where the head has reached in relation to the ischial spines.*

**Abdominal palpation**

The position of the head is described in fifths above the pelvic brim (as in **Figure 4.3,** Session 4). For convenience, the width of the five fingers placed horizontally above the symphysis pubis, is used to express fifths of the head above the brim. A head which accommodates the full width of the five fingers (closed), is not engaged yet and is mobile above the brim.

As the head descends, the portion of the head remaining above the brim decreases and can accommodate fewer fingers.

The head is engaged when the portion above the brim is represented by two fingers' width or less.

### Vaginal examination

The level of the presenting part in relation to the ischial spines can be identified by vaginal examination and is expressed in centimetres above and below the ischial spines (**Figure 7.28**). When the lowermost portion of the presenting part is at the level of the ischial spines, it is said to be at zero station. If the presenting part is at the level of the inlet, it is at -4 cm station. As the presenting part descends, the examiner can estimate with the fingers how many centimetres above or below the ischial spines the presenting part is. When the presenting part is at the perineum, the station is +3 cm.

In communities where there is a high occurrence of cephalopelvic disproportion, assessing the descent of the fetal head by abdominal palpation is more accurate than just noting by vaginal examination where the head has reached. There can be a situation when the head has a caput which is presenting at the vulva but the biggest circumference of the head is still 4/5 above the brim.

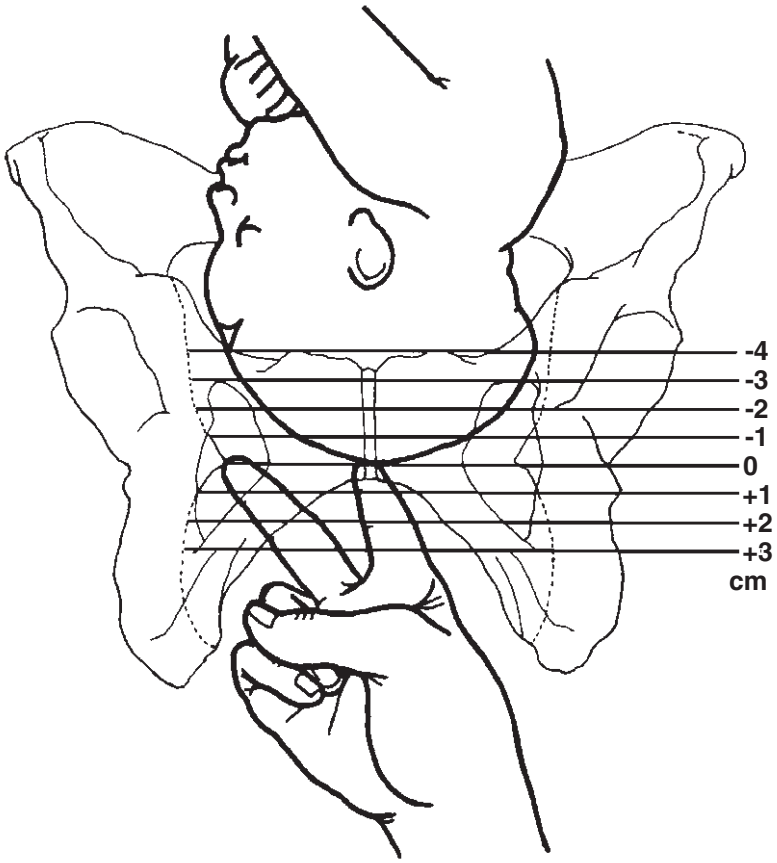



**Figure 7.28:** Assessing the descent of the fetal head by vaginal examination

**Assessing competence**

*In order to confirm that a student can assess the descent of the fetal head, the answers to the following questions should be yes:*

1. *Can the student skilfully palpate the fetal head and accurately determine the descent in fifths?*

2. *Can the student accurately assess the level of the presenting part in centimetres above or below the ischial spines by vaginal examination?*

3. *Can the student accurately record the level of the fetal head on the partograph?*

4. *Does the student know the possible causes of a high head in labour and what action should be taken if there is failure to descend?*

## SKILL: RECOGNIZING OBSTRUCTED LABOUR

**Teaching method**

*Teach this in clinical practice as the opportunity arises.*

**Teaching content**

*Refer to Session 3, and Session 4 on the partograph.*

**Assessing competence**

*In order to confirm that a student can diagnose obstructed labour, the answer to the following questions should be yes:*

1. *Is the student able to assess the general condition of the woman?*

   - *Does she/he examine for the signs of dehydration?*
   - *Does she/he examine for the signs of fever?*
   - *Does she/he examine for the signs of shock?*
   - *Does she/he note the presence of exhaustion?*

2. *Is the student able to recognize the following serious signs of obstructed labour on abdominal examination?*

   - *tonic uterine contractions or uterine exhaustion*
   - *uterus tightly moulded around fetus*
   - *failure of the fetal head to descend*
   - *Bandl's ring.*

*In some cases the uterine activity may be inadequate, with less than 3 contractions in 10 minutes, each lasting less than 40 seconds.*

3. *Is the student able to recognize the following signs of obstructed labour on vaginal examination?*

   - *secondary arrest of cervical dilatation and descent of the presenting part in the presence of good contractions*

- *oedematous cervix which is poorly applied to the presenting part*
- *vagina hot and dry*
- *a large caput succedaneum*
- *excessive moulding of fetal head*
- *ballooning of the lower uterine segment*
- *formation of palpable or visible retraction ring*
- *maternal and fetal distress.*

*Other findings may be a malposition or malpresentation.*

## SKILL: URINARY CATHETERIZATION

### Teaching method

*This obviously has to be carried out during the actual care of a woman, though the teaching and assessment do not need to take place during the third stage of labour if there is another suitable opportunity.*

*It must be emphasized that a woman must never be catheterized for the purpose of teaching or assessing. Catheterization should take place only if her clinical condition indicates the need.*

### Teaching Content

#### Anatomical landmarks

*If you feel the students need to be re-familiarized with the main landmarks of the female external genital organs, use* ***Figure 7.29****.*

#### Procedure

Clean the genital area with antiseptic solution. Wash and scrub hands and put on sterile gloves. Separate the labia with the fingers of the left hand and insert the catheter into the urethral orifice (**Figure 7.30**). If difficulty is encountered while introducing the catheter, the sterile gloved forefinger of the left hand should be inserted into the vagina and placed along its anterior wall. The tip of the catheter can then be felt, and if it is directed parallel with the finger in the vagina, the catheter will enter the bladder without injury to the urethra. If the catheter is obstructed by the fetal head, upward pressure on the head by the finger in the vagina will permit passage of the catheter.

Emphasize the need for:

- aseptic technique to avoid infection
- accuracy and skill in the procedure
- gentle handling to avoid injury to the urethra
- sensitive approach
- an empty bladder in labour, especially in relation to the prevention and management of obstructed labour. (A full bladder can prevent the fetal head from entering the pelvis).

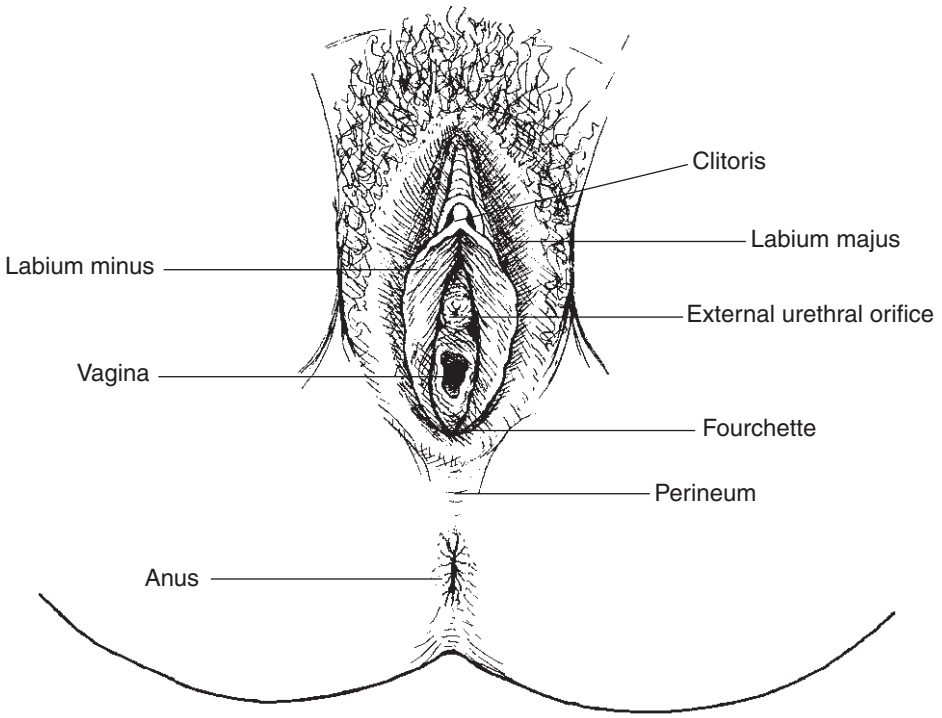



**Figure 7.29:** Female external genital organs

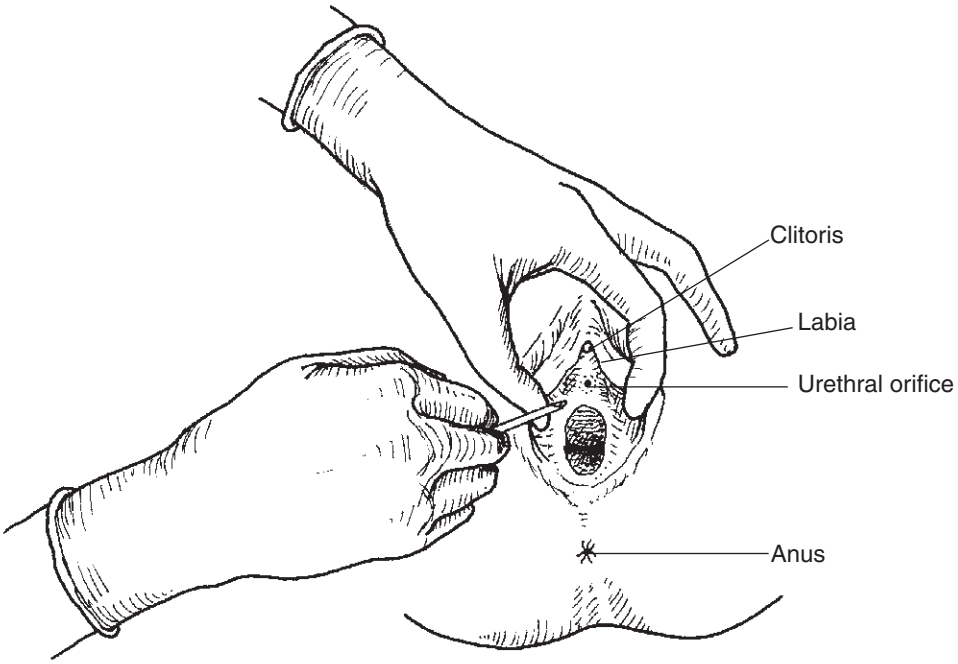



**Figure 7.30:** Urinary catheterization, separating the labia and introducing the catheter into the urethral orifice

## Complications

Since bacteria are normally found in the outer portion of the urethra, catheterization may introduce bacteria into the bladder, where the organisms find ideal conditions for multiplication, especially during the puerperium (the bladder is traumatized by delivery and there is often incomplete emptying and residual urine). Therefore catheterization can result in urinary tract infection including pyelonephritis, especially if the catheter is left in place for many hours.

## Indications for catheterization

Urinary catheterization should be done only when really necessary because of the associated risk of infection. The catheter should be removed as soon as it is no longer needed.

Urinary catheterization is done when it is important to keep the bladder empty and the woman is unable to void on her own:

- during the first stage of labour a full bladder may prevent the head from entering the brim, retard the descent of the fetus, cause poor uterine contractions.
- during the third stage of labour a full bladder may prevent proper placental separation and cause PPH.
- during the management of atonic PPH, the bladder should be emptied and kept empty. In this case the catheter may have to be left in place.
- before vaginal operative manipulations (e.g. forceps, symphysiotomy) are done, the bladder has to be emptied.
- in the management of eclampsia it is important to monitor the urinary output; in which case, a self-retaining catheter must be used.

## Assessing competence

*In order to confirm that a student is competent, the answer to these questions must be yes.*

1. *Is the student able to justify why catheterization is necessary for this woman?*

2. *Does the student carry out the procedure skilfully with attention to*

   - aseptic technique?
   - accuracy in locating the urethral orifice?
   - gentleness?
   - sensitivity to the woman's needs?

3. *Does the student drain the bladder adequately and explain why she decides to remove the catheter or leave it in place?*

4. *Does the student measure and test the urine and explain the significance of her findings?*

## SKILL: TAKING BLOOD SAMPLES FOR ANALYSIS

### Teaching method

*Students should be familiar with the anatomical location of the veins of the arm. They should be able to identify the veins of the cubital fossa which are most easily accessible for venepuncture - i.e. the median cubital vein or cephalic vein.* ***Figure 7.31****.*

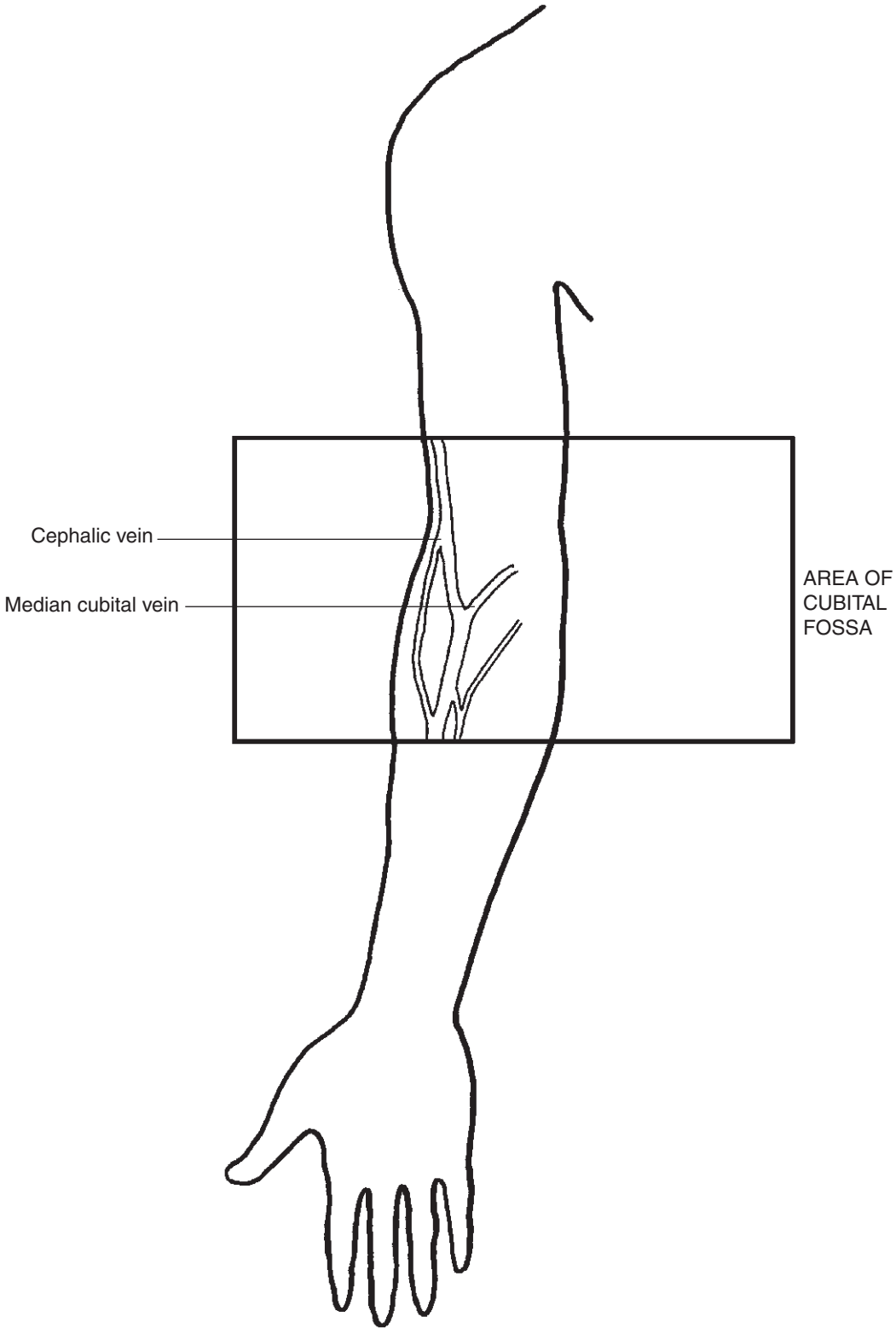



**Figure 7.31:** Important veins of the cubital fossa (right arm)

*Help students to identify these veins on their own arms. This will be easier when pressure is applied to the upper arm or a tourniquet is applied.* ***Figure 7.32****.*

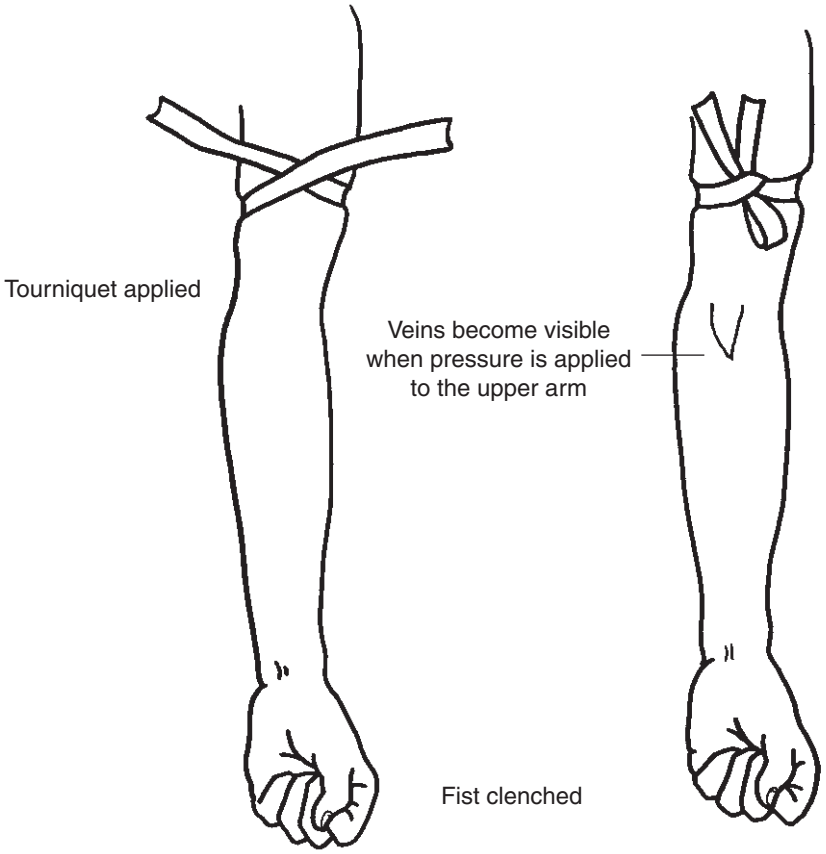



**Figure 7.32:** Applying a tourniquet to find a vein

*It is best to help students obtain blood specimens from healthy women in an antenatal clinic at first before they attempt this or an intravenous infusion (IVI) in an emergency.*

*Use of a tourniquet should also be taught in the classroom before students apply these in clinical practice.*

*The blood specimens should include at least haemoglobin, grouping and cross-matching.*

*Students should also be taught about the test tubes necessary for transporting the blood as well as the laboratory request forms and how to fill them in. Emphasize the importance of accurate, clear labelling.*

*In addition, students should know the correct procedure to use in obtaining a specimen for blood culture. It is sometimes possible to make good cultures in the laboratory from clotted blood taken, but it is much better to inject the blood into a culture medium.*

*It would be wise to consult laboratory staff about this procedure and again arrange some practical teaching and demonstration by them.*

*You will also need to have any ward procedure or policy available for reference.*

*Finally, students should be reminded of the necessity to protect the woman, herself/himself and any assistant(s) against accidental infection of blood-borne diseases, especially HIV, when taking or handling blood samples.*

## Teaching content

Teaching should cover the following points:

1. Understanding the reasons for specific blood tests.

2. Importance of taking blood samples for grouping/cross-matching before running in plasma expanders when setting up an IVI.

3. Preparation of all equipment, including:

   - syringe, needles and test tubes for transport of specimens
   - correct laboratory request forms accurately completed
   - tourniquet or assistant to compress upper arm.

4. Comfortable position of the woman with arm extended and supported.

5. Explain to the woman what you are doing.

6. In applying a tourniquet, stress:

   - placing of tourniquet at mid-biceps level well above the elbow joint (as in **Figure 7.32**)
   - correct pressure to compress blood vessels and restrict circulation without causing excessive pressure and pinching the skin.

7. Correct site for venepuncture.

8. Sterile technique: cleaning the site with antiseptic solution, use of sterile needle.

9. Precautions against injuries: using gloves if the woman is in a high risk category (i.e. HIV infection or hepatitis).

**Assessing competence**

*In order to confirm that a student is competent, the answer to these questions must be yes.*

1. *Is the student able to obtain a blood specimen without causing unnecessary trauma?*
2. *Is the student's technique carried out according to priorities?*
3. *Does the student protect the woman, herself/himself and any assistant(s) from infection?*
4. *Does the student select appropriate test tube(s) to transport the specimens to the laboratory and send them without delay with the correct request forms?*
5. *Does the student record the tests taken?*
6. *Does the student recognize the limitation of his/her own skill and request assistance when needed?*
7. *Does the student dispose of used syringes and needles safely?*

## SKILL: SET UP AND MONITOR INTRAVENOUS INFUSION

**Teaching method**

*Students should be familiar with the anatomical location of the veins of the forearm which are used for IV infusion. Avoid using veins near a joint. The forearm or back of the hand are best (**Figure 7.31, and Figure 7.33**).*

*Encourage students to trace the course of the veins on their own arms. This is made easier if pressure is applied to the upper arm to constrict the circulation while the arm is extended (as shown in **Figure 7.32**).*

*It is essential to demonstrate the technique. It is helpful to ask the student to assist by compressing the arm above the infusion site when setting up the IVI. Describe carefully what you are doing. It is best to help students learn this skill in the first place in a clinical situation which is not extremely urgent.*

**Teaching content**

Selecting the appropriate fluid:

Normal saline or Ringer's lactate should be given prior to blood transfusion because they can be given quickly and correct blood volume and blood pressure quickly. Blood is sticky and cannot be given so quickly.

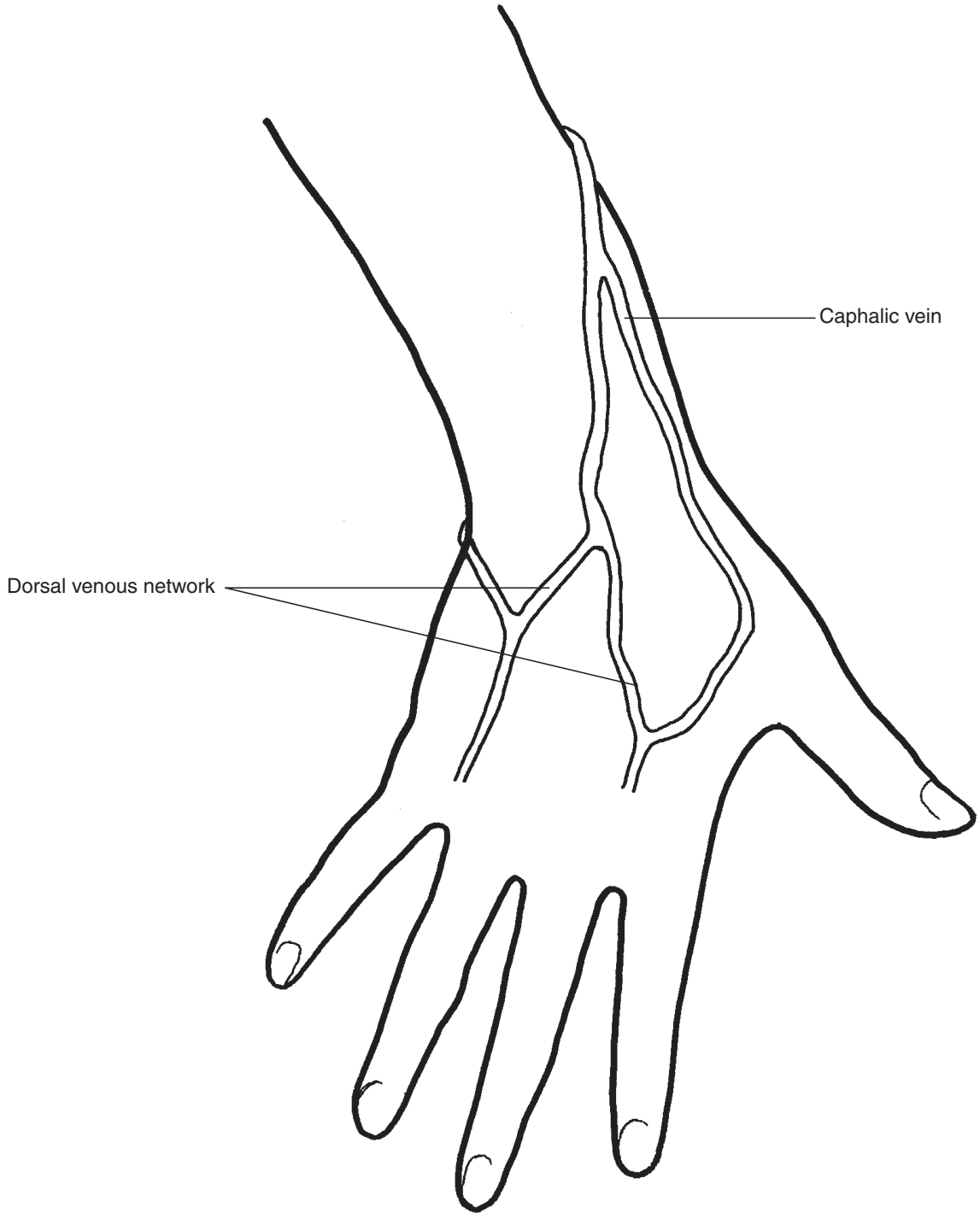



**Figure 7.33:** Important veins of back of the hand

There are few clear indications for plasma transfusion and the risks can often outweigh the benefits to the woman. Plasma can transmit most of infections present in whole blood and can also cause transfusion reactions.

Blood is given when shock from loss of blood or sepsis is severe.

Teaching should cover the following points:

1. Identifying the need for IVI: when body fluid is lost because of bleeding, infection, dehydration or shock.

2. Preparation of all equipment, including:

   - sterile intravenous tubing
   - selection of a large (No. 18) needle or cannula - selection of appropriate fluid
   - running IVI fluid through the tubing to make sure there is no air in the tubing
   - sticky tape, already cut into strips
   - drip stand or nail in the wall
   - rubber tourniquet
   - splint with bandage if woman is restless or unconscious
   - clean swabs for cleaning the site of the IVI
   - gloves.

3. Comfortable position: the woman's arm should be extended and supported.

4. Correct site for the infusion: veins are usually easiest to see on the back of the hand and forearm. Do not use a vein that crosses a joint as a needle placed there will move every time the joint moves and may come out.

5. Sterile technique: wash your hands with soap and water, clean the site of infusion (use gloves to protect yourself if the woman is in a high risk category - i.e. HIV infection or hepatitis).

6. If a midwife does not succeed in putting up an IVI after two, or at the most three attempts, she should call a more experienced colleague.

7. Fix the IV needle or cannula firmly on completion with strips of sticky tape. Use an armboard to keep the joint nearest the vein from moving.

8. If the woman is in shock, run in 1 litre of saline or sodium lactate in about 15 minutes and repeat every 20 minutes until signs of improvement (i.e. pulse begins to slow, blood pressure begins to rise), then give 1 litre every 4-6 hours.

9. Aim for:

   - Systolic blood pressure of at least 100 mmHg
   - Pulse rate below 90 bpm
   - Urinary output of at least 100 ml in 4 hours.

10. Monitor fluid balance and record accurately. Also monitor blood loss, pulse, blood pressure, respirations and urinary output.

11. Complications of intravenous infusions:

**local problems**:

- **thrombophlebitis** (infection of the vein) and swelling at the injection area (due to leakage of fluids into the tissues). If these problems occur, the needle should be removed and the intravenous infusion restarted in another vein.

**generalized problems**:

- **septicaemia** (infection of the blood); this can be prevented by using sterile needles, tubing and intravenous fluids.
- **circulatory overload**: giving too much intravenous fluid too fast can cause heart failure and the lungs may fill up with fluids. Usually 1 litre is given IV every 4–6 hours, but in cases of shock, fluids are infused rapidly to correct shock. In these cases the woman should be watched carefully for the development of breathing problems and swelling of the face, especially around the eyes. These may be signs of too much fluid. The blood pressure and pulse should be checked every 15 minutes.

12. To infuse fluids at an appropriate rate; the following points have to be considered:

   - the amount of fluid to be given
   - the time period over which the fluid is given
   - the type of tubing and drop size. Each type of tubing has a slightly different drop size. For example, some tubing has 20 drops per cc, while another type may have only 10 drops per cc.

Table 1 shows how many drops per minute must be given in order to give a certain amount of fluid over a fixed period of time. To use the table, it is necessary to know the number of drops per cc, which will depend on the type of tubing used.

## Assessing competence

*In order to confirm that a student is competent, the answer to these questions must be yes.*

1. *Is the student able to set up an IVI, selecting the site accurately and inserting the needle/cannula without causing unnecessary trauma at the first or second attempt?*

2. *Is the student's technique carried out according to priorities?*

3. *Does the student protect the woman, herself/himself and any assistant(s) from contamination and possible infection?*

4. *Does the student select an appropriate IVI fluid and give an adequate amount at the correct speed?*

5. *Does the student monitor the woman's condition, knowing the signs that indicate improvement and deterioration?*

6. *Does the student explain the procedure and reason for the intervention to the woman?*

7. *Does the student keep appropriate records?*

8. *Does the student recognize the limitation of her/his own skill and send for help when needed?*

**Table 1: IV Fluid Rates**

| Amount of fluid | Time period | Drops per cc (type of tubing) | Drops per minute |
|---|---|---|---|
| 1 litre | 20 minutes | 10 | Too fast to count |
| 1 litre | 20 minutes | 20 | Too fast to count |
| 1 litre | 4 hours | 10 | 40 |
| 1 litre | 4 hours | 20 | 80 |
| 1 litre | 6 hours | 10 | 28 |
| 1 litre | 6 hours | 20 | 56 |
| 1 litre | 8 hours | 10 | 20 |
| 1 litre | 8 hours | 20 | 40 |

In general, the formula to figure out any IV infusion rate is as follows:

$$\frac{\text{Amount of fluid given (cc)}}{\text{Time for infusion to occur (minutes)}} \times \text{No. of drops per cc} = \text{No. of drops per minute}$$

In order to convert the time period from hours to minutes, multiply the number of hours by 60. This will give the number of minutes over which the IV fluids are to be given.

## SKILL: ADMINISTERING NECESSARY DRUGS

### Teaching method

*Introduce the subject in the classroom and follow this with clinical teaching, which should include:*

- *ordering and storage of drugs*
- *demonstration and supervision of inserting an intravenous cannula*
- *demonstration of IV administration of a drug*
- *supervision of student giving IV antibiotic (or other drug according to need in clinical practice).*

### Teaching content

Students should know the names, uses and doses of drugs used in the management of obstructed labour. These consist mainly of antibiotics, since women with obstructed labour often develop infection, especially if there has been prolonged rupture of membranes, i.e. over 18 hours.

### Giving antibiotics

Antibiotics may be given to treat infections, i.e. therapeutic antibiotics, or to prevent the onset of infection, i.e. prophylactic antibiotics.

The following guidelines are given for the administration of therapeutic antibiotics.

1. Use broad spectrum antibiotics. These are effective against a wide range of bacteria (reason: you do not know which bacteria you are dealing with).

2. To combat serious infections, a combination of antibiotics is most effective. The following combination is recommended:

   Ampicillin 2 g IV every 6 hours, **and**
   Gentamicin 5 mg/kg body weight IV every 24 hours, **and**
   Metronidazole 500 mg IV every 8 hours.

3. If the infection is not severe, amoxicillin 500 mg orally every 8 hours should be sufficient.

4. After initial treatment, as described above, women with severe infections should be referred to a higher level health facility.

The following guidelines are given for the administration of prophylactic antibiotics:

1. For ruptured membranes for more than 18 hours at 37 weeks to delivery, give Ampicillin 2 g IV every 6 hours until delivery, **or** Penicillin G2 million units IV every 6 hours until delivery.

2. For ruptured membranes at less than 37 weeks, i.e. PROM, give Erythromycin base 250 mg PO and Amoxicillin 500 mg PO, both 3 times a day for 7 days.

Refer, unless delivery is imminent, to a higher level health facility with special neonatal facilities.

## Prescribing drugs

The following points are relevant to the use of all drugs by midwives.

1. If midwives are practising without the constant supervision of a doctor, specific drugs and doses should be agreed with the responsible medical officer.

   If there are legal/medical/midwifery/nursing regulations which prevent midwives from giving drugs in the absence of a doctor, the situation needs to be reviewed.

2. Make sure that there is an adequate supply of necessary drugs available at all times.

3. Make sure that the expiry date of the drugs has not passed and that they are stored safely and at the appropriate temperature.

4. Write clearly on the prescription sheet:

- Name of drug:
- Dose:
- Route of administration:
- Date and time of each dose given:
- Signatures of: practitioner prescribing and practitioner administering dose.

Remember to give:

- the correct dose,
- of the correct drug,
- at the correct time,
- by the correct route,
- to the correct woman.

5. Be familiar with the side-effects of drugs administered and observe the woman for any adverse reaction.

It is good practice to ask a second practitioner to check a drug before administration, whenever this is possible.

## Intravenous drugs

Midwives should also learn a number of rules about intravenous administration of antibiotics.

1. Midwives must be skilled in the administration of IV injections.

2. The antibiotic may be given through an indwelling cannula which has been inserted into a vein.

3. It is very important to make sure that:

   - syringes and needles/cannulae are sterile
   - there is no air in the syringe
   - the cannula is patent (i.e. not blocked)
   - the cannula is properly inserted in the vein.

4. Observe the patient very carefully for any adverse reaction to the injection. If this occurs, no further doses should be given and the woman should be referred to the doctor immediately.

## Assessing competence

*In order to confirm that a student is competent, the answer to these questions must be yes.*

1. *Is the student able to select appropriate broad spectrum antibiotics for use?*

2. *Does the student know the correct doses of all the drugs she needs to use, whether IV, IM or oral?*

3. *Is the student able to recognize the need for antipyretics and analgesics? Does she use these along with other methods of reducing temperature and relieving pain?*

4. *Does the student understand the importance of noting the expiry date of drugs and not using them beyond that date?*

5. *Does the student understand the importance of storing drugs properly and of keeping adequate stocks of drugs?*

6. *Can the student demonstrate her/his understanding of the importance of:*

   - *the correct dose,*
   - *of the correct drug,*
   - *at the correct time,*
   - *by the correct route,*
   - *to the correct woman?*

7. *Does the student administer the drug carefully, accurately and safely?*

8. *Does the student keep accurate and complete records of all drugs administered?*

## SKILL: MAINTAINING FLUID BALANCE

### Teaching method

*Introduce the subject in the classroom and follow this with clinical teaching:*

*Take the students to the wards and clinically examine women for signs of dehydration.*

*Clinical examination of the woman should be followed by examination of the charts/records.*

*It is not good practice to make decisions by looking only at the charts and not at the woman.*

*Discuss with students:*

- whether the clinical examination of the woman shows that she is well hydrated or dehydrated
- whether the charts are kept correctly
- whether the charts show an adequate fluid intake and urinary output.

### Teaching content

#### Hydration and dehydration

It is essential to have sufficient fluids to maintain life and health. What is sufficient will depend on:

- fluid intake
- excretion of body fluids
- the environment and climate
- the presence of a fever
- the general health of the woman.

The output of fluids should be equivalent to the intake. Fluid is lost from the body through:

- skin
- expired air
- faeces
- urine.

There is normally a marked diuresis in the first few days following delivery. This means that the woman passes a lot more urine at this time. This gets rid of the extra fluid retained in the body during pregnancy.

In a tropical climate, the body maintains its normal temperature by increasing fluid lost through the skin (sweating). This is obvious in humid climates because the skin remains wet. In dry climates the moisture quickly evaporates and may not be noticed, but fluid is still lost in this way.

A woman with a fever loses more water through the skin than normal as an attempt by the body to reduce the fever. She thus needs more fluids than normal.

A woman who is well-hydrated should have:

- skin that is elastic and not dry (gently pinching the skin should leave no mark)
- a moist mouth
- a good output of urine.

Therefore the signs of dehydration are:

- the woman is thirsty
- her mouth is dry
- eyes are sunken
- skin pinch goes back slowly (because skin is dry)
- urinary output is low (less than 200 ml per 4 hours)
- her urine is concentrated (dark colour).

Fluids can be given by mouth or intravenously. Fluids must be given intravenously when a woman is in shock (low blood pressure, fast weak pulse) or develops a complication such as severe puerperal sepsis, postpartum haemorrhage, eclampsia or obstructed labour.

*Have available the fluid balance charts which are normally used and make sure that students understand how to use them.*

## Assessing competence

*In order to confirm that a student is competent, the answer to these questions must be yes.*

1. *Can the student understand the importance of giving plenty of fluids to a woman with a fever?*

2. *Can the student recognize whether a woman is taking sufficient fluid?*

3. *Can the student recognize signs of dehydration?*

4. *Can the student maintain a fluid balance chart?*

5. *Does the student provide the woman with adequate fluids to drink?*

6. *Does the student make sure that drinking water is clean and safe?*

7. *Does the student actively encourage the woman to drink?*

8. *Does the student know when a woman needs intravenous fluids?*

*This skill should be linked with the basic skill of setting up and monitoring an intravenous infusion.*

## SKILL: EPISIOTOMY AND REPAIR*

### Teaching method

*The teaching methods and topics are essentially the same as for "Suturing perineal tears", with the exception of point 2 which should now read:*

*Classification of episiotomy.*

*Types of incision:*

- *mediolateral* ***(Figure 7.34)***
- *median (****Figure 7.35****).*

*Students should know the advantages and disadvantages of each type of incision and be competent in making the incisions as well as repairing them.*

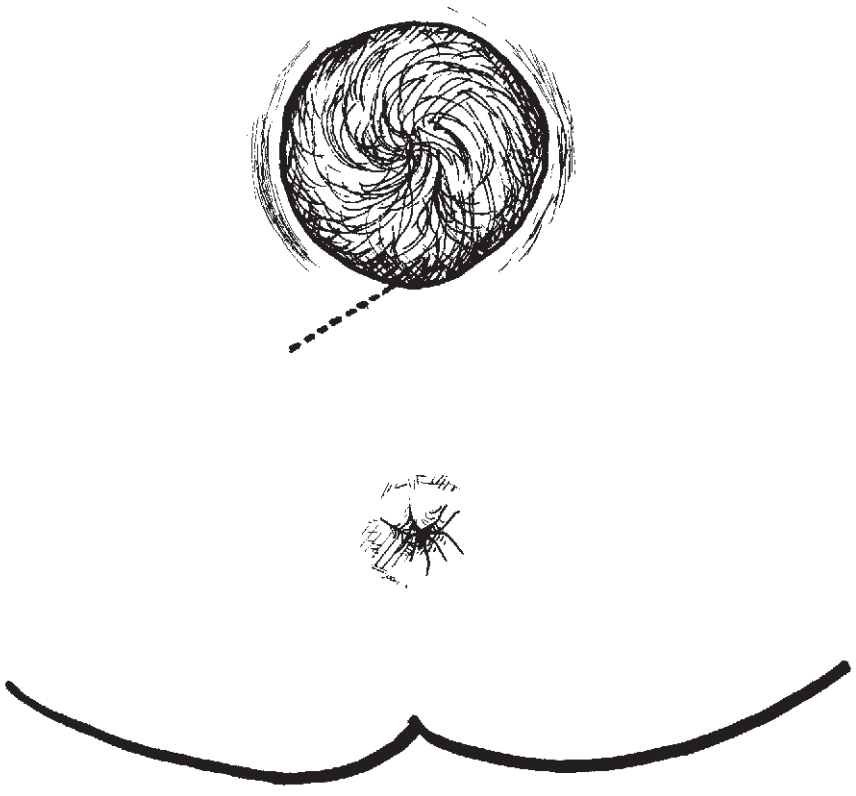


**Figure 7.34:** Mediolateral episiotomy

* Parts of this section are adapted from *Life-saving skills manual for midwives. module 4: episiotomies and repair of lacerations, Procedure for giving local anesthesia, Reasons for cutting an episiotomy, How to cut an episiotomy.* 2nd ed. American College of Nurse-Midwives, Washington, DC., 1991, pp. 3–5.

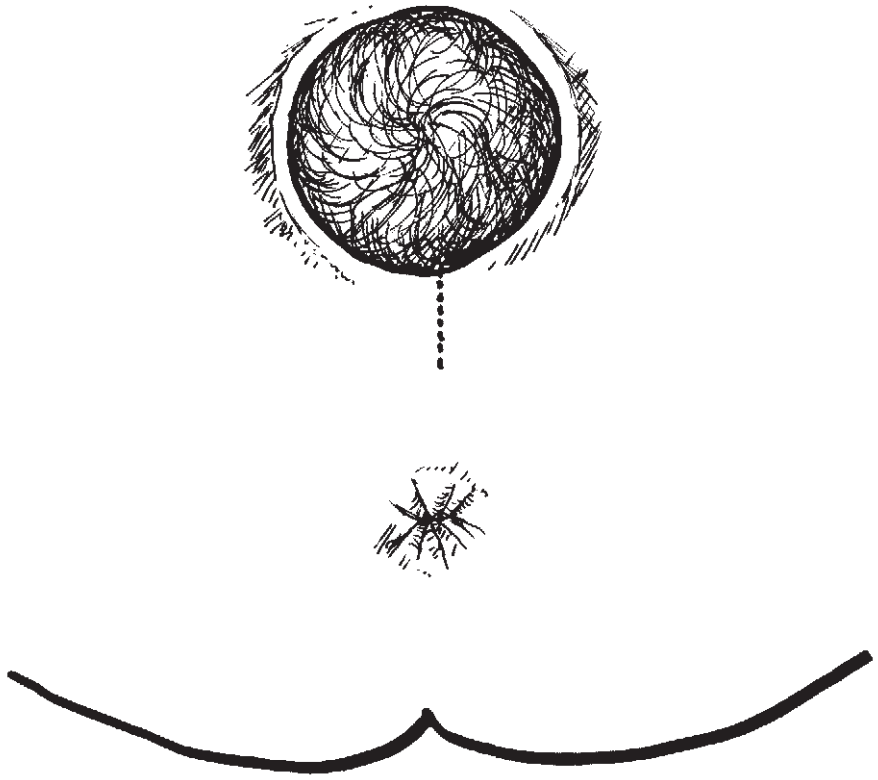


**Figure 7.35:** Median episiotomy

## Teaching content

### Reasons for an episiotomy

Episiotomies should not be made routinely. The procedure should be done for the following indications only:

1. Fetal distress in the second stage of labour, *to speed up the delivery of the baby.*
2. Previous (repaired) third or fourth degree tear.
3. Complicated vaginal delivery, e.g. shoulder dystocia, breech, forceps or vacuum deliveries.
4. Maternal stress due to exhaustion or heart failure.
5. A very tight perineum that prevents delivery.

### Mediolateral incision

*Advantages:*

- less risk of extension to the anal sphincter
- avoids damage to the Bartholin's gland
- easy to do
- reasonably easy to repair.

*Disadvantages:*

- takes a bit longer to repair
- slower to heal
- more blood loss
- post-operative pain is greater.

**Median incision**

*Advantages:*

- faster healing process
- easy to do
- easy to repair
- midline area of perineum has very few blood vessels and bleeding will be less
- less bruising
- intercourse resumed earlier than for women who had a mediolateral episiotomy.

*Disadvantages:*

- extension of a midline incision may involve the anal sphincter.

**Timing of episiotomy**

The episiotomy must be made neither too soon nor too late. If it is made too early, bleeding from the incision will be profuse. If it is made too late it is very difficult to do safely because the baby's head distends the perineum so much. It is best to make the episiotomy when the perineum is thin and bulging and about 3–4 cm of the presenting part is visible.

**Making the incision (mediolateral episiotomy)**

Give local anaesthetic:

- Put a 22 gauge 1½ inch (3 cm) needle on a 20 cc syringe
- Fill the syringe with lignocaine
- Protect the baby's head by placing your two fingers between the baby's head and the perineum. (Injecting anaesthetic into the baby's head can cause death)
- Insert the whole length of the needle from the fourchette just below the skin down the perineum at a 45° angle (**Figure 7.36**). Pull back on the plunger of the syringe and check for blood (if the local anaesthetic is injected directly into a blood vessel it can cause heart irregularity, seizures and death). Inject evenly as you withdraw the syringe
- Then angle the needle to one side of the centre and repeat the procedure. Repeat on the other side. You should have injected about 10 ml of anaesthetic by this time. Remember to protect the baby's head with your fingers throughout the procedure
- Take a sharp pair of straight, blunt-ended scissors. Place two fingers of your other hand in the vagina between the scissors and baby's head. This is to prevent accidentally injuring the baby. Start at the centre of the perineum and angle (slant) your scissors out at a 45° angle. If you are right-handed, cut towards the mother's right buttock. If you are left-handed, cut towards the mother's left buttock (**Figure 7.37**).

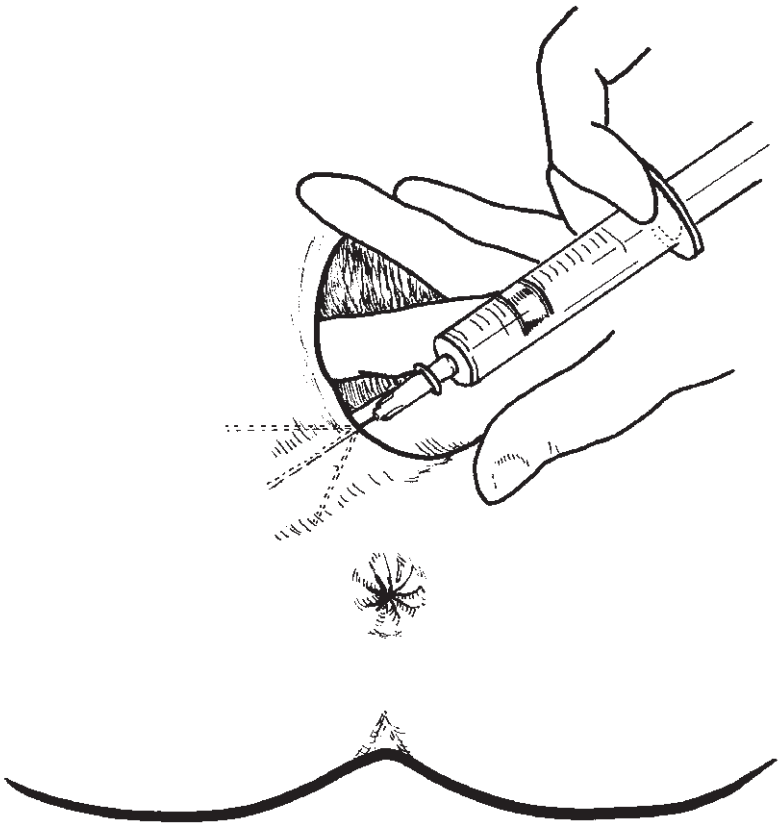


**Figure 7.36:** Infiltrating tissues with local anaesthetic

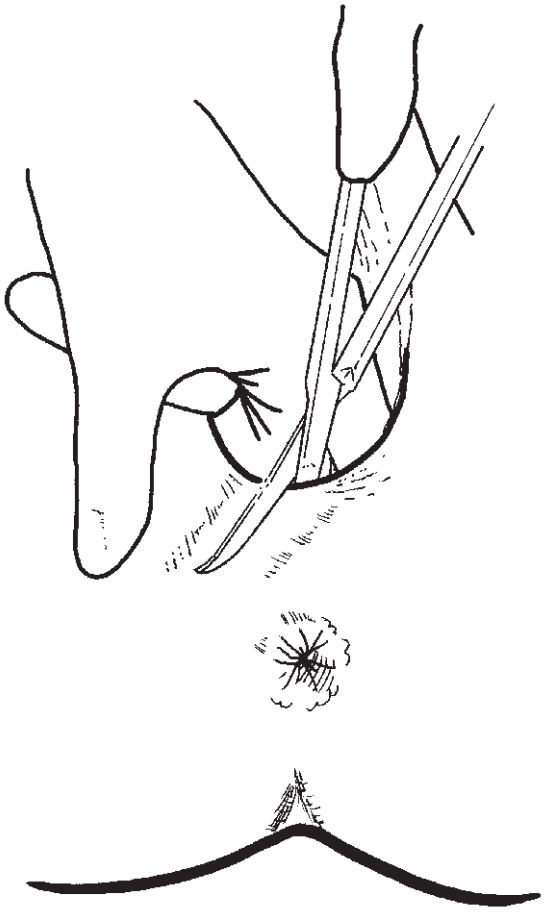


**Figure 7.37:** Making the incision, while inserting two fingers to protect the baby's head

Make the episiotomy with one large cut. Many tiny cuts may give a ragged edge to the wound making repair and healing more difficult.

Control the presenting part immediately after making the incision as it may come out quickly due to the extra available space.

Ensure that the shoulders have rotated to the midline before delivery to prevent an extension of the episiotomy.

If the baby is not delivered within 1 or 2 contractions of making the episiotomy, apply sterile gauze and press firmly over the cut to reduce bleeding.

### Technique of repair (mediolateral episiotomy)

Use polyglycolic suturing material, if available, otherwise 2/0 catgut. Clean the wound area with an antiseptic solution.

Infiltrate with lignocaine if not already done, by inserting the needle up both sides of the vaginal incision and injecting as you withdraw. Repeat for the perineal area.

Repair the vaginal mucosa using 2–0 suturing material with a continuous suture (**Figure 7.38**).

- Start the repair about 1 cm above the apex of the wound and continue to the level of the vaginal opening
- At the opening of the vagina, bring together the cut edges of the vaginal opening
- Bring the needle under the vaginal opening and out through the incision and tie
- Close the perineal muscle by using interrupted 2–0 sutures
- Close the skin using interrupted (or subcuticular) 2–0 sutures (**Figure 7.39** and **Figure 7.40**).

### Assessing competence

*In order to confirm that a student is competent, the answer to these questions must be yes.*

1. *Can the student state the indications for an episiotomy?*

2. *Does the student know the advantages and disadvantages of each type of incision?*

3. *Does the student perform the episiotomy at the right time?*

4. *Can the student infiltrate the perineum effectively with local anaesthetic?*

5. *Does the student withdraw the barrel of the syringe to check for blood before injecting local anaesthetic and understand the reasons for this safety check?*

6. *Does the student make the incision satisfactorily?*

7. *Does the student repair the episiotomy correctly?*

8 *Does the student maintain aseptic technique?*

9. *Can the student advise the woman correctly on after-care?*

*Note:*

*(a) Episiotomy should never be performed only for practice purposes.*

*(b) The teacher should teach and assess students suturing an episiotomy before teaching and assessing the suturing of a tear. Episiotomies are often easier to suture than tears.*

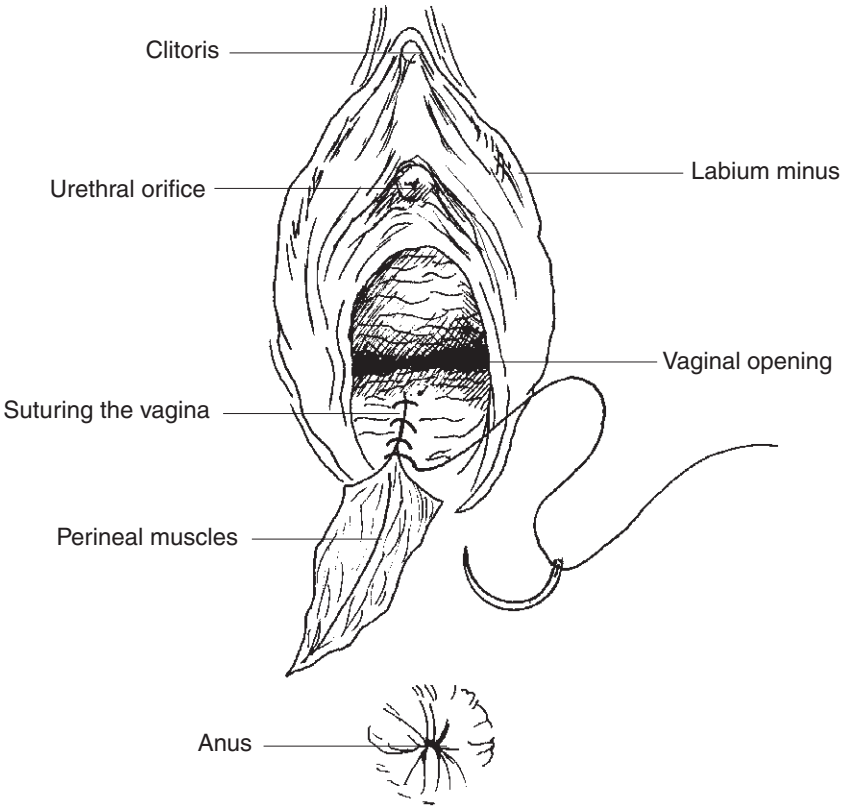



**Figure 7.38:** Repair of mediolateral episiotomy (suturing the vagina)

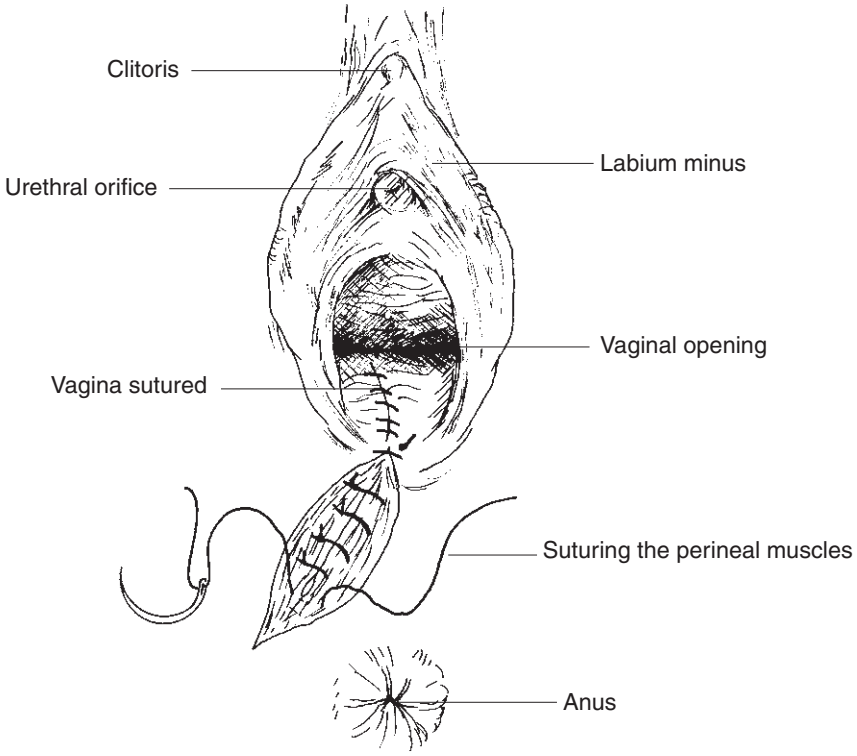



**Figure 7.39:** Repair of mediolateral episiotomy (suturing the perineal muscles)

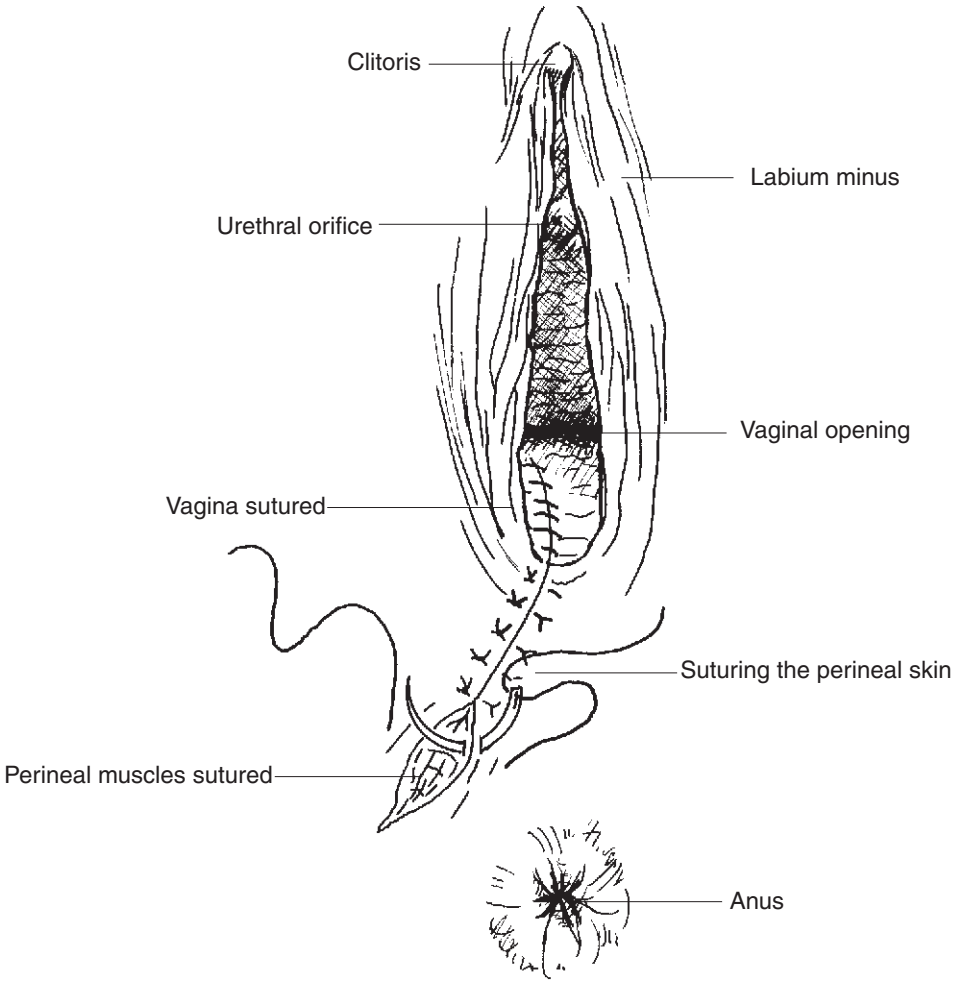



**Figure 7.40:** Repair of mediolateral episiotomy (suturing the skin

## SKILL: MAINTAINING RECORDS

### Teaching method

*Introduce or review this topic in the classroom and then do some clinical teaching with small groups.*

*Ask students to discuss their own records in the small groups.*

*Help them identify problems and shortcomings in their record keeping.*

*Make sure that students learn to criticize their own records before criticizing those of others. Remind them that they will not help others to improve their record keeping if they make them feel threatened.*

### Teaching content

*The students may be familiar with the principles of maintaining records from their general nursing. They need to recognize the special requirements of record keeping in midwifery and the special needs of the woman who has recently delivered.*

*Remind students about the importance of record keeping. Stress that it must be:*

- clear
- legible
- accurate.

*and must include:*

- dates
- times
- signatures.

*Discuss the importance of balance in record keeping. A midwife should write:*

- enough to give a clear account
- not too much that takes up valuable time when the midwife needs to care for the woman.

***This is very important***.

*Ask the students to form discussion groups to consider the question "What is the purpose of record keeping?"*

*Write the purpose on the blackboard as the students give the information.*

**Purposes of record keeping**

1. *To review progress or lack of progress.*
2. *To enable appropriate care to be given at the right time.*
3. *To assist safe continuation of care between different staff.*
4. *To provide a record for future reference.*
5. *To meet statutory requirements. (Here refer to midwifery/nursing rules and regulations regarding record keeping. Read out the relevant section and make sure students understand it. Do this by asking them to translate it into simpler English or into another language with which they are familiar).*

**Assessing competence**

*In order to confirm that a student is competent, the answer to these questions must be yes.*

1. *Does the student understand the principles and purpose of record keeping?*
2. *Are the student's own records easy to understand and use? Are they clear, legible and the right length?*
3. *Can the student explain the legal/statutory requirements which refer to record keeping by midwives?*

# 8 VACUUM EXTRACTION

# SESSION 8
# VACUUM EXTRACTION

**Aims**

- The aim of this session is to enable students to become competent in performing vacuum extraction.

**Objectives**

On completion of Session 8, students will be able to:

- Describe the indications and conditions for vacuum extraction.
- List the contraindications for vacuum extraction.
- Describe the equipment required for vacuum extraction.
- Explain the safety measures applicable to vacuum extraction.
- Describe the preparation of the patient for vacuum extraction.
- Demonstrate the steps in the procedure of vacuum extraction.
- Demonstrate post-procedural care following vacuum extraction.
- List the information to be documented following vacuum extraction.

**Plan**

Lecture.

Simulated practice.

Clinical practice.

Total time: It is advisable to allow at least one week to teach the skills in Session 7, and Session 8. However, the actual time required will depend on the needs and abilities of students, and the availability of relevant clinical cases to ensure each student will become competent. Other factors to be considered will include the availability of teachers and clinicians willing and able to participate in the teaching of these skills.

**Resources**

Skills checklist.

*Managing complications in pregnancy and childbirth: a guide for midwives and doctors.* Geneva, World Health Organization, 2000 (WHO/RHR/00.7).

Vacca A, *Handbook of Vacuum Delivery in Obstetric Practice*. 2nd ed. Vacca Research; Brisbane, 2003.

Equipment for simulated practice.

## INTRODUCTION

*When teaching the skill of vacuum extraction, midwifery teachers may wish to collaborate with other teachers and/or clinicians who are competent in the skill (e.g. practicing midwives, obstetricians).*

*The skill should first be demonstrated by the teacher or by a clinician who is competant in this procedure. Simulated practice should take place prior to clinical practice, to provide students with an opportunity to prepare and handle equipment and become familiar with the sequence of steps in the procedure. This could be done in the classroom using a pelvic model, a model of a newborn and the equipment for vacuum extraction. Where possible (i.e., depending on the availability of patients requiring vacuum extraction), clinical practice should take place under direct supervision and feedback to enable students to develop competence in the skill.*

*Remind students that the infection prevention practices described with respect to managing prolonged and obstructed labour (Session 6) apply to the skill of vacuum extraction.*

## VACUUM EXTRACTION

Vacuum extraction can help reduce the complications of prolonged labour. It is a life saving procedure to be used by competent clinicians who can confidently identify the conditions appropriate to the procedure. Worldwide, more vacuum extractions are performed than forceps deliveries. While the indications and contraindications for the use of vacuum extraction and forceps delivery are mostly similar, current research studies show that the technique of vacuum extraction can be mastered with less experience than is deemed necessary for the safe use of forceps.

### Indications

The indications for vacuum extraction are:

- delay in the second stage of labour
- the need to shorten the second stage of labour for fetal or maternal benefit.

The following conditions should be present prior to attempting vacuum extraction:

- vertex presentation
- term fetus
- cervix fully dilated
- head at least at 0 station or no head palpable above the symphysis pubis.

**Contraindications**

The contraindications for vacuum extraction include the following:

- cephalopelvic disproportion
- non engagement of the fetal head
- breech presentation
- face presentation
- brow presentation
- transverse lie
- preterm labour (36 weeks and less gestation)
- signs of major fetal distress (vacuum extraction should only be attempted if quick straightforward procedure can be expected).

**Equipment**

The equipment for vacuum extraction consists of:

- a rigid or soft cup
- a traction device
- a vacuum system.

The cup is attached to the scalp by providing negative pressure. Cups of various designs and materials are available and hand pumps or electrical vacuum pump systems are available. Both systems have a regulator valve and pressure gauge.

Prior to use, the vacuum extraction equipment must be assembled, inspected and tested to make sure there are no leakages in the system.

A hand pump and two types of cups as shown in (**Figure 8.1**).

Increasingly, electrical vacuum pumps with soft touch cup are becoming more readily available (**Figure 8.2**). However, unless there is a constant supply of electricity, it is advisable to have a hand pump available as a backup.

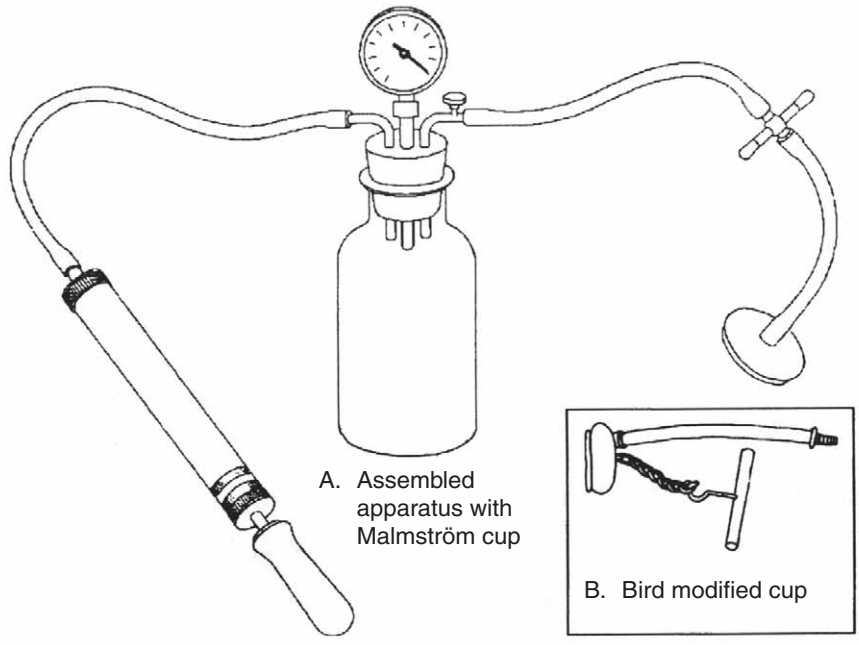



**Figure 8.1:** Vacuum hand pump

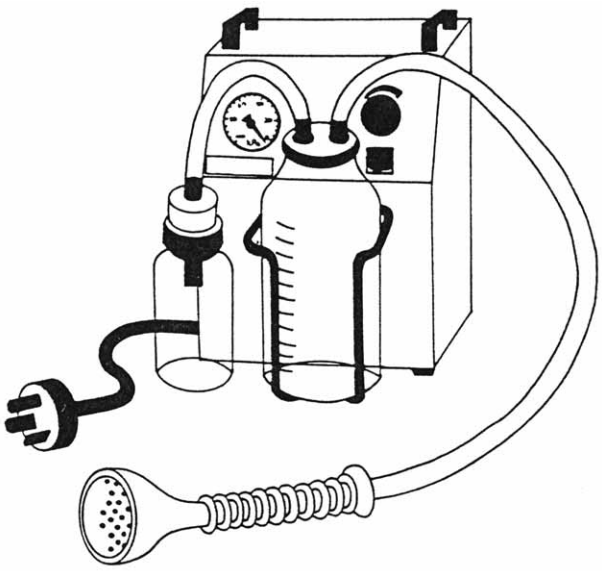


**Figure 8.2:** Electrical vacuum pump with soft cup

Vacca A, *Handbook of Vacuum Delivery in Obstetric Practice.* 2nd ed. Vacca Research; Brisbane, 2003.

## Preparation for vacuum extraction

Preparation of the woman for vacuum extraction should include the following:

- Explain the procedure to the woman and provide emotional support and encouragement
- Make sure the woman has emptied her bladder
- If possible, a midwife, nurse or other health care worker should stand by the woman's head to reassure her
- Position the woman in the dorsal position with the thighs flexed toward the abdomen, especially during pushing and traction.

Other preparatory measures include:

- Ensure all equipment is assembled correctly and vacuum checked
- Ensure oxytocic drug for management of the third stage is prepared, drawn up in syringe ready for injection unless oxytocin via IV infusion is already *in situ*
- Ensuring that an assistant is available
- Washing hands and putting on high-level disinfected or sterile surgical gloves
- Cleaning the woman's vulva with antiseptic solution

## Procedure

Steps in the procedure of vacuum extraction.

1. **Locate the flexion point**. The largest cup that will fit should be used, with the centre of the cup over the flexion point, 1 cm anterior to the posterior fontanelle (**Figure 8.3**). This placement will promote flexion, descent and autorotation with traction.

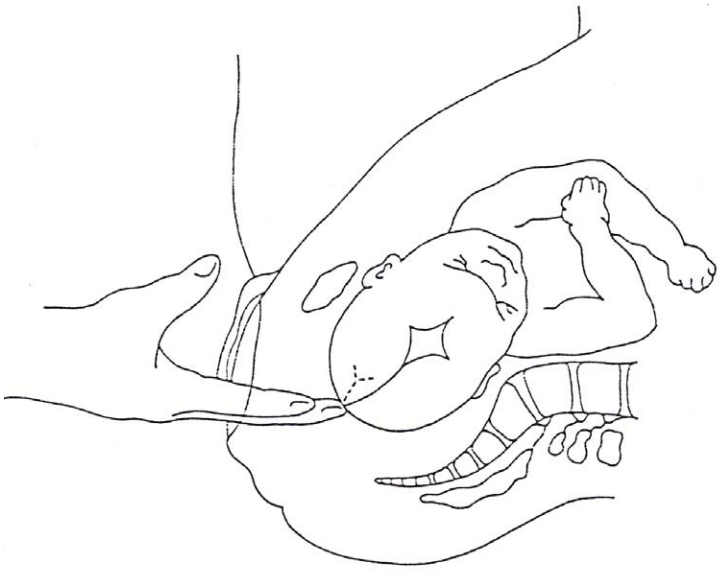


**Figure 8.3** Locating the flexion

Vacca A, *Handbook of Vacuum Delivery in Obstetric Practice*. 2nd ed. Vacca Research; Brisbane, 2003.

2. **Apply the cup**. The distal end of the cup tubing is attached to the vacuum pump. The cup is moistened with safe water or lubricant jelly if vagina is very dry. The operator retracts the perineum with two fingers and the cup is inserted (**Figure 8.4**) and manoeuvred to the flexion point. After correct placement, the operator holds the cup in place and a finger of the other hand is swept around the cup to make sure no vaginal tissue is trapped between the cup and the scalp.

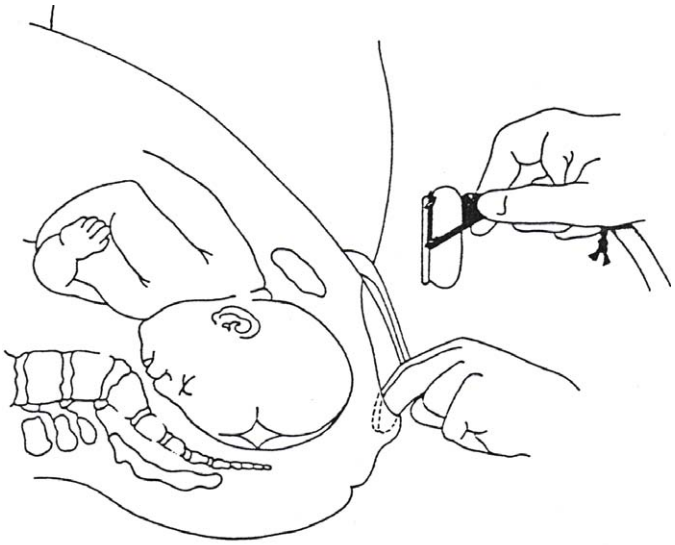


**Figure 8.4** Insertion of the cup

Vacca A, *Handbook of Vacuum Delivery in Obstetric Practice*. 2nd ed. Vacca Research; Brisbane, 2003.

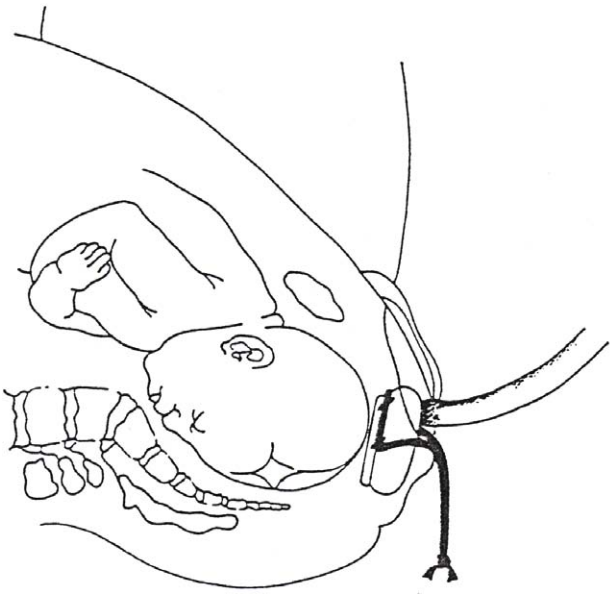


**Figure 8.5** Cup over the flexion point in the AO position

Vacca A, *Handbook of Vacuum Delivery in Obstetric Practice*. 2nd ed. Vacca Research; Brisbane, 2003.

An episiotomy may be needed for proper placement at this time (see Session 7). If an episiotomy is not necessary for placement, delay the episiotomy until the head stretches the perineum, or the perineum interferes with the axis of traction. This will avoid unnecessary blood loss.

3. **Create a vacuum**. With the pump, create a vacuum of 0.2 kg/m$^2$ negative pressure and check the application of the cup. Increase the vacuum to 0.8 kg/cm$^2$ and check the application of the cup again.

4. **Apply traction**. Traction should always be a two-handed procedure with the right hand holding the traction bar, while the thumb of the left hand presses against the dome of the cup and the index finger rests on the scalp and monitors true descent of the bony head (**Figure 8.6**).

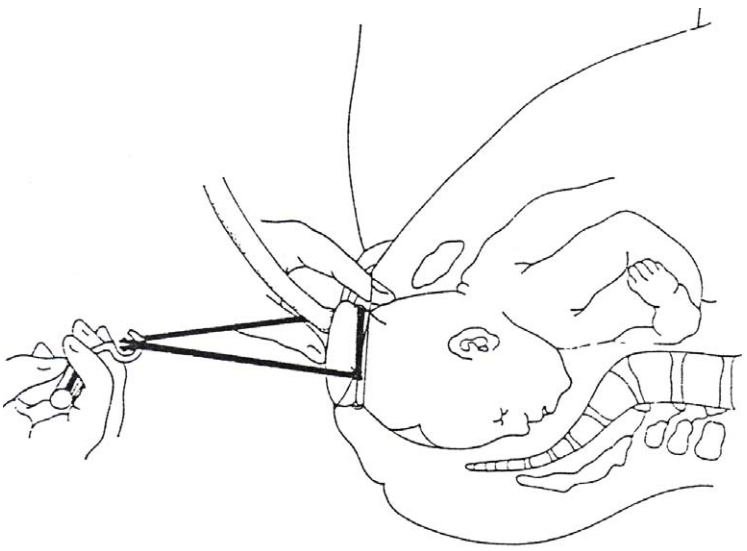


**Figure 8.6** Applying initial traction (head already at outlet)

Vacca A, *Handbook of Vacuum Delivery in Obstetric Practice*. 2nd ed. Vacca Research; Brisbane, 2003.

Traction is applied at the onset of each contraction and is maintained throughout the contraction. In between contractions, no traction is applied. The **first** pull is often one to find the right direction for descent and causes flexion (**Figure 8.7**). The **second** pull must show real progress. The angle of traction is determined by the position of the head, e.g. if the head is in mid-pelvis, traction must be applied in a downward direction; if the head is in low-pelvis, traction at 45° is applied; if the head is already at outlet, traction is more parallel. Traction is discontinued and redirected if an audible hiss is heard (signalling imminent loss of vacuum).

Between contractions check:

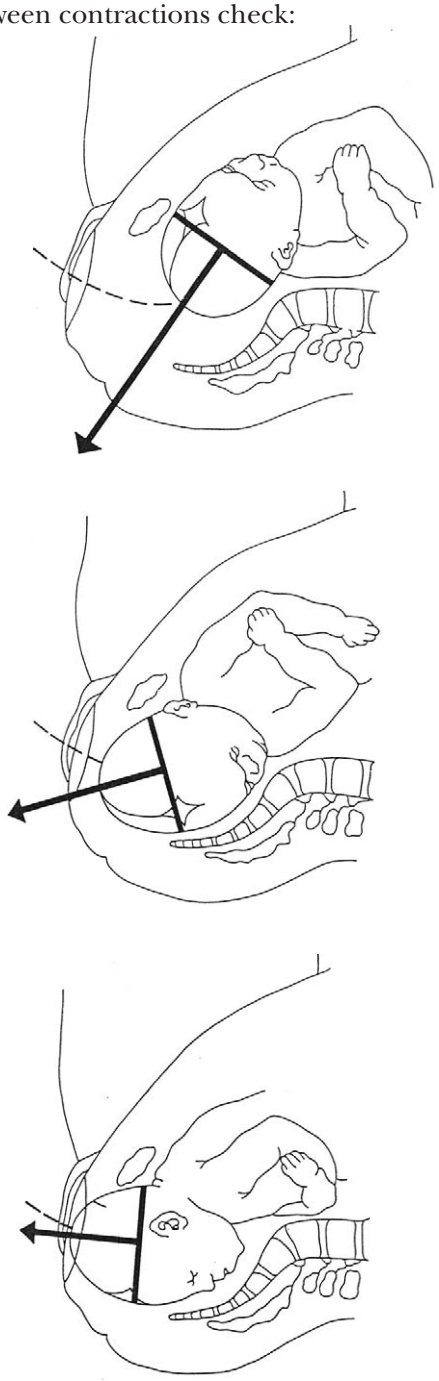
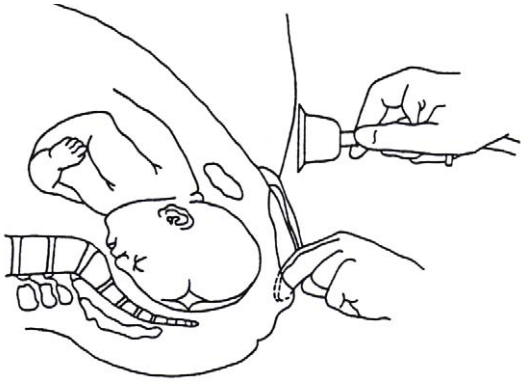
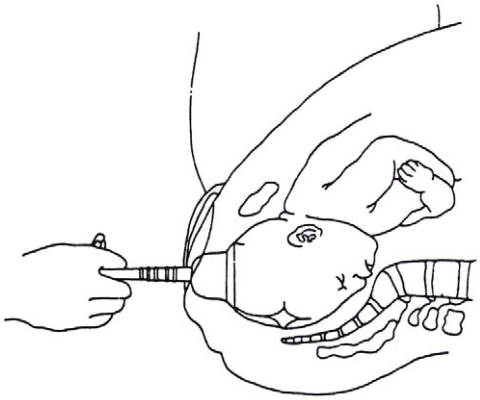


**Figure 8.7:** Axis for traction changes according to the pelvic curve

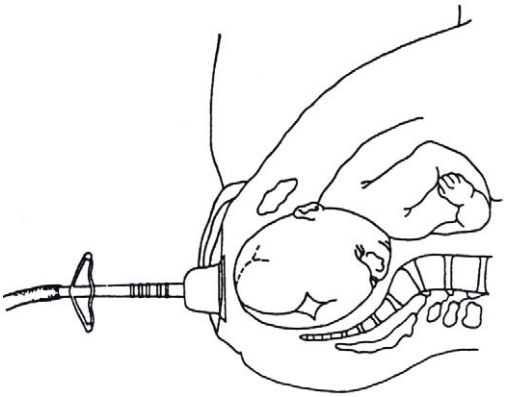
Vacca A, *Handbook of Vacuum Delivery in Obstetric Practice*. 2nd ed. Vacca Research; Brisbane, 2003.



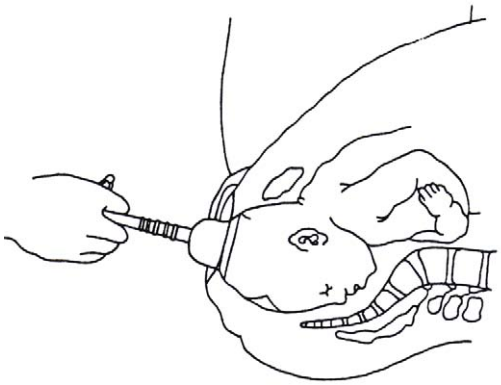
**Step 1**: Retracting the perineum and inserting the cup



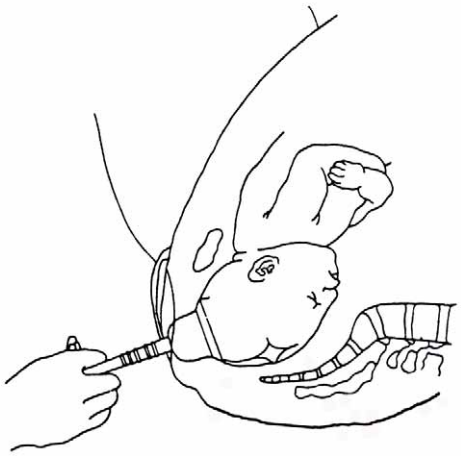
**Step 4**: Applying traction



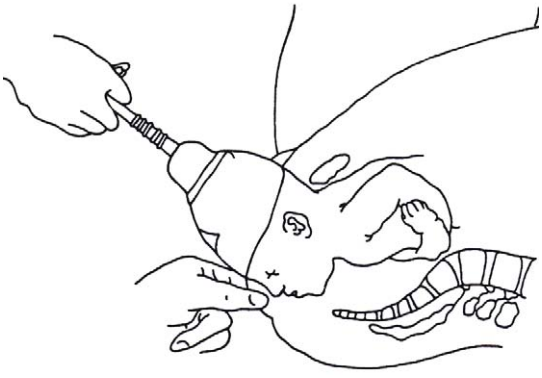
**Step 2**: Placing the cup over the flexion point



**Step 5**: Changing the direction of traction following the curve of the birth canal



**Step 3**: Apply traction to bring the head down to the perinium



**Step 6**: Delivering the head (hand protects perineum whilst completing delivery of the head)

**Figure 8.8** Steps in the procedure for delivery of the head

Vacca A, *Handbook of Vacuum Delivery in Obstetric Practice*. 2nd ed. Vacca Research; Brisbane, 2003.

- fetal heart rate
- application of cup.

**Note:**

- Never use the cup to actively rotate the baby's head. Rotation of the baby's head will occur with traction
- With progress, and in the absence of fetal distress, continue the "guiding" pulls for a maximum of 30 minutes, changing direction of traction as the head descents as described earlier in **Figure 8.7**.

5. Encourage the woman to assist descent with expulsive efforts. Delivery of the head should be slow and conducted as for a normal birth (**Figure 8.8**, steps 1–6).

6. **Removal of cup**. As soon as the head is crowned or after delivery of the head, the vacuum is released, the cup removed, and delivery of the baby completed.

## Safety measures during the procedure of vacuum extraction

Attention to several factors will help to ensure a safe outcome and minimize the risks to the mother and baby:

- Check that there are no contraindications, and all conditions for attempting vacuum extraction are present (see page 161)
- Importance of using correct size cup
- Correct application of the vacuum cup is essential for successful outcome. Failure rates are high when anatomical landmarks are not checked and deflexion applications occur
- The amount of traction required to deliver the fetus is inversely proportional to the maternal expulsive effort. Therefore the operator should ensure that uterine contractions and expulsive efforts are effective. If hypotonic uterine contractions were the cause of the prolonged labour, oxytocin will have been commenced via intravenous infusion. If this was the case, then it may be necessary to increase the oxytocin administration slightly, to ensure contractions are strong and effective. However, care is required in order not to stimulate uterine contraction and cause hypertonic or tonic contraction
- Traction should only be applied during a contraction in conjunction with maternal pushing. Traction should never be continuous
- Progress of descent must be seen clearly with the second or third pull. The finger-thumb position **(Figure 8.6)** will identify a pull where only the scalp and not the bony head follows and no true descent takes place. These negative pulls are more likely to cause serious cranial injury.

Vacuum extraction has failed if:

- The head does not advance with each pull
- The fetus is undelivered after three pulls with no descent, or after 30 minutes
- The cup slips off the head twice at the proper direction of pull with maximum negative pressure.

## Complications

Although vacuum extraction is relatively safe in skilled hands, complications can occur. These include:

### Effects on the baby

- Irritability; is more likely if procedure was problematic or prolonged
- Retinal haemorrhage; occurs frequently with normal vaginal birth, but may be more often with vacuum extraction. No long-term problems have been found, but if noted parents should be assured that they will disappear without treatment
- Scalp abrasions; the effect of applying pressure to scalp results in an artificial caput succdaneum, known as a "chignon". This will be present immediately after birth and disappear within a few hours. Occasionally, the scalp over the cup is discoloured and bruising and abrasions are found marking the position of the rim of the cup on the scalp. These should be kept clean and dry and will heal spontaneously
- Cephalhaemotoma; in a limited number of cases, tissue under the scalp is damaged and a collection of blood forms. This is usually not present at birth, but appears within a few hours. The swelling is characterized by the fact that it is hard, unlike the oedematous swelling in caput, and is confined to the skull bone (it does not cross a suture line). It can be painful on touch. This may take a few days or even up to a week to resolve and parents need a great deal of reassurance. Newborns with a cephalhaemotoma and excessive irritability should be prescribed analgesia, and referred for assessment by a medical doctor with skills in newborn care, in order to exclude cerebral damage
- Neonatal jaundice; any newborn with sustained injuries and bruising is likely to be at risk from higher than normal levels of breakdown of damaged red cells - therefore at risk to neonatal jaundice that may become of clinical significance. Newborns delivered using vacuum extraction require careful monitoring for the first two to three days after birth. Signs of high levels of jaundice must be referred, or advice on management sought from a health practitioner with specialist skills in the care of the newborn.

### Effects on the mother

Most complications following vacuum extraction are related to

inexperienced application of the procedure and include:

- Damage to cervix because full dilation was not correctly diagnosed
- Tear of perineum
- Postpartum haemorrhage; if prolonged labour and tears
- Due to poor practice prior to the procedure and lack of attention to infection prevention protocols, postnatal sepsis can occur.

## Immediate post-procedural care

Vacuum extraction must always be accompanied by active management of the third stage of labour.

- Ensure that the uterus is well contracted and that blood loss is not excessive
- Check for genital tract trauma and repair any lacerations or tears that may have occurred
- Repair episiotomy
- Check the woman's pulse, temperature and blood pressure
- Ensure that the baby is dry and warm, that the cord is securely tied, and that she/he is put to the breast as soon as possible
- Examine the baby's scalp and note any injuries. Explain to the parents the reason for the large swelling "chignon" and assure them that it will disappear within a few hours and will not damage the baby's head
- Allow the woman and the baby to rest comfortably where their recovery can be monitored.

## Documentation

After the procedure, the following information must be documented:

- Indication for vacuum extraction
- Date and time of the procedure
- Name of the clinician performing the procedure and the names of personal who assisted
- Length of the procedure and the number of pulls
- Position of the fetal head prior to application of the cup (OA, OL, OP)
- Delivery position (OA or OP)
- Condition of the baby at birth, colour, and if breathing, and any resuscitation needed as well as position of "chignon" and any bruising
- Details of the third stage of labour
- Details of any drugs used
- Maternal condition following the procedure
- Any complications affecting the mother or baby.

## Maintenance of equipment

After the procedure, equipment should be decontaminated, cleaned and disinfected according to recommended practices (Session 6).

## Assessing competence

The following checklist should be used during direct observation of a student performing vacuum extraction, to assess achievement of competence in the procedure.

The teacher should observe whether the student completes each of the steps included in the checklist. Tick "yes" for each step completed correctly; tick "no" if the step was missed or it was not completed correctly. In the "remarks" column, positive observations and problem areas should be identified.

In order for a student to be assessed as competent, **every step in the procedure must be completed correctly**.

For students who do not complete every step in the procedure correctly, arrangements must be made for additional instruction and supervised practise. The teacher must then use the checklist again to observe and assess the student's competence.

| Clinical skills checklist for vacuum extraction ✓ | | | |
|---|---|---|---|
| **Step** | **Yes** | **No** | **Remarks** |
| **Instruments and supplies**:<br>▪ prepares the necessary equipment | | | |
| **Patient preparation**:<br>▪ explains the procedure to woman<br>▪ provides emotional support and encouragement<br>▪ ensures the woman's bladder is empty<br>▪ places the woman in lithotomy position<br>▪ washes hands thoroughly and puts on high-level disinfected or sterile surgical gloves<br>▪ cleans the vulva with an antiseptic solution<br>▪ checks all connection on the vacuum extractor and tests vacuum | | | |
| **Steps in the procedure**:<br>▪ assesses the position of fetal head and identifies the posterior fontanelle<br>▪ applies the largest cup that will fit, with the centre of the cup over the flexion point<br>▪ performs an episiotomy, if necessary for placement of the cup<br>▪ checks the application of the cup and ensures that there is no maternal tissue within the rim of the cup<br>▪ has assistant create a vacuum of 0.2 $kg/cm^2$ negative pressure with the pump and checks application of cup<br>▪ increases the vacuum to 0.8 $kg/cm^2$ negative pressure with the pump and checks application of cup<br>▪ starts traction in the line of pelvic axis and perpendicular to the cup<br>▪ with each contraction, applies traction in a line perpendicular to the plane of the cup rim<br>▪ between each contraction checks the application of the cup and has assistant check the fetal heart<br>▪ continues the "guiding" pulls until delivery of head but does not exceed maximum of 30 minutes<br>▪ releases the vacuum when the head has been delivered and completes delivery correctly | | | |
| **Immediate post-procedural care**:<br>▪ ensures that the uterus is well contracted and that blood loss is not excessive<br>▪ checks for genital tract trauma and repairs any lacerations or tears<br>▪ repairs episiotomy<br>▪ checks the woman's pulse, temperature and blood pressure<br>▪ checks the baby's scalp<br>▪ ensures that the baby is dry and warm, that the cord is securely tied, and that the baby is put to the breast as soon as possible<br>▪ allows the woman and newborn to rest comfortably where her recovery can be monitored<br>▪ talks to the mother<br>▪ completes all records | | | |

Teacher's comments:

Student's comments:

# 9 CASE STUDIES

# SESSION 9
# CASE STUDIES

**Aims**

- To enable students to reflect on practice and realise the important link between process and outcome in respect of preventing and managing obstructed labour.
- To enable students to learn from their experience and to make practical recommendations which will improve the outcome when managing prolonged and obstructed labour.

**Objectives**

On completion of Session 9, students will be able to:

- Present a case study and discuss the important questions relating to it.
- Identify the process which led to the outcome of the cases studied, emphasizing important points of practice in the prevention and management of prolonged and obstructed labour.
- Discuss how other women may also benefit from aspects of care which contributed to a safe outcome of lessons learned from a poor outcome.
- Describe how improved maternity care can influence the outcome of the management of prolonged and obstructed labour, giving examples from experience.
- Explain the importance of reflecting on practice in order to evaluate and improve care.

**Plan**

Case studies, discussion, group work, feedback (3 hours).
Optional tutorials (1 hour per student or small group of students).

**Resources**

Instructions for Students: guidelines for case study.
Instructions for Group Work.

## INTRODUCTION

*If students are inexperienced, it would be wise to arrange individual or small group tutorials to explain how to do a case study. Use records from the clinical area. These tutorials will need to take place before Session 9 and should include clinical teaching.*

*Divide the students into small groups: each group will prepare and present one case study. Give the students the Guidelines for case study, provided at the end of this session. To obtain the needed information students should use case records which the teacher has selected from the clinical area.*

*Three case studies have been suggested for this session. The teacher may decide to use just two as part of a shorter session and repeat the session later.*

*If possible it would be appropriate to use at least one case where the outcome was good and another where the outcome was not so good. Discuss the reasons for the different outcomes,*

## OUTLINE OF THE SESSION

1. *Introduction to the session. Remind students:*

   - *of what has previously been learned through case studies*
   - *that it is important to reflect on practice and learn from experience*
   - *that there is a relationship between process and outcome and that we can influence these in order to promote safe motherhood.*

Now introduce the students who will present case studies.

2. *Presentation of case study 1.*

3. *Opportunity for question and answer about case study 1.*

4. *Presentation of case study 2.*

5. *Opportunity for question and answer about case study 2.*

6. *Presentation of case study 3.*

7. *Opportunity for question and answer about case study 3.*

8. *Summary of case presentations. Here it is very important:*

- *to link process with outcome*
- *for students to realize that they can influence this link.*

9. *Give credit to the students who have presented the case studies. This is especially important if they have demonstrated an ability to:*

   - *reflect on their own practice*
   - *make constructive criticism of others.*

   *This will help them to develop as safe practitioners.*

10. *Discuss:*

    - *how more women may benefit from care which contributed to a safe outcome;*
    - *if the woman died, what were the avoidable factors.*

    *Criticizing your own practice can be an excellent way of setting an example to your students. Make it a positive discussion from which everyone can benefit.*

11. *The review of a case of a woman who has suffered from obstructed labour will have raised questions on the quality of care provided. These need to be discussed further. Divide the students into groups for group work. Give them the Instructions for Group Work and assign either Section A or B, plus Section C to each group for discussion*

**Feedback**

*At the end of the session you should have a list of what the students have learned about good practice. Emphasize that these are important in saving lives and therefore in promoting safe motherhood. Discuss how good practices can be further developed/encouraged and how poor practice can be avoided.*

*The class should also have put forward recommendations about practice that needs to be improved. From these recommendations, develop an action plan. Discuss:*

- *WHAT needs to happen*
- *HOW it can happen*
- *WHO will take responsibility*
- *WHO will help*
- *WHERE the action will take place*
- *WHEN the action will take place*
- *WHEN it will be evaluated.*

## HOW TO END THIS MODULE

*Ask each student to write down one thing they have learned from this module which has already changed their practice. It may be a small thing, but small things can be very important.*

*Emphasize that every midwife who continues to learn and can apply that learning to her/his practice helps to promote safe motherhood.*

*Lastly, ask each student to write down one thing about their practice which they intend to change in order to further promote safe motherhood.*

*Students may wish to share some of the changes they have already made and those they intend to make. Invite them to do so but do not try to force them.*

## INSTRUCTIONS FOR STUDENTS – Guidelines for case study

Your case study must concern some aspect of management of prolonged and obstructed labour. It should include the following:

Case number:
(This will enable the case record to be traced if needed but will protect the confidentiality of the woman).

| | |
|---|---|
| Age: | |
| Parity: | |
| Date of the first day of the last menstrual period (LMP): | |
| Estimated date of delivery (EDD): | |
| Social background: | |
| Past obstetric history: | |
| Relevant medical and surgical history: | |
| History and course of present pregnancy, labour and where relevant, puerperium: | |

**SUMMARY OF CARE AND MANAGEMENT TO DATE**

You will be required to discuss the following important issues.

| | |
|---|---|
| 1. What happened? This will include details of the problem which occurred in labour, and the condition of the woman on completion of labour. | This is the outcome |
| 2. What predisposing factors to obstructed labour were present (e.g. short stature, pelvic deformity, history of previous difficult labour)? | This is the process |
| 3. How were pregnancy, labour and postnatal care managed? | |
| 4. Summarize the main points of obstetric care, emphasizing how the case was managed. | This considers the relationship between process and outcome |
| 5. Were any opportunities missed? Factors may have been overlooked which, in another woman, would have resulted in maternal death. In cases of death, ask Was this avoidable? | This demonstrates what can be learned through experience |

## INSTRUCTIONS FOR GROUP WORK

Discuss either Section A or B (your teacher will advise you which section to choose), plus Section C.

Ensure confidentiality of the people involved, including the patient and staff.

**Discussion of case studies on the Management of obstructed labour.**

**A. In cases where the woman survived:**

1. Which actions saved the woman's life?
2. What made these actions possible?
3. Were there any points in the management or clinical situation that could be improved in order to reduce the risk for another woman?

**B. In cases where the woman died:**

1. What was the cause of death, and what factors predisposed to it?
2. What were the problems in giving life saving management?
3. What needs to be done in order to avoid these problems in the future?

**C. Reflecting on practice:**

1. List any facts about practice which you have learned through these case studies.
2. Make recommendations which you think will help to make the management of prolonged and obstructed labour safer in your practice area.

Appoint a person to report back.

## GLOSSARY

As this is a combined glossary for all six modules, the terms below may not necessarily be found in this module.

# A

**Abortion**

The term refers to the termination of pregnancy from whatever cause before the foetus is capable of extrauterine life.

**Complete abortion** is the expulsion from the uterus of all the products of conception, which is more likely to occur before the eighth week of pregnancy.

**Incomplete abortion** is the partial expulsion of the products of conception. All or part of the placenta may be retained resulting in profuse bleeding. Usually occurs in the second trimester of pregnancy. Women who seek emergency treatment for complications of abortion, whether they have had a spontaneous or induced abortion, are most often diagnosed with incomplete abortion.

**Induced abortion** refers to the termination of pregnancy through deliberate interference to end the pregnancy. Induced abortion may take place in a safe health care setting and in accordance with the law and health policy guidelines or it may occur outside of the health care system and the provisions of the law.

**Inevitable abortion** involves vaginal bleeding, abdominal cramping and progressive dilation of the cervix, with or without rupture of the membranes. It is impossible for the pregnancy to continue and eventual expulsion of the products of conception will occur.

**Missed abortion** occurs when the fetus dies and is retained in the uterus. The dead conceptus will be expelled eventually, although blood coagulation disorders may develop in cases of missed abortion which persist for more than 6–8 weeks.

**Septic abortion**

An abortion (loss of pregnancy during the first 22 weeks) that is followed by infection of the uterus and may spread throughout the genital tract causing fever and chills, foul-smelling vaginal discharge, pelvic pain and septicaemia. Septic abortion happens most commonly where facilities and standards are poor.

**Spontaneous abortion** refers to terminated pregnancy for which no deliberate steps have been taken to end the pregnancy. Spontaneous abortion, which is sometimes referred to as miscarriage, affects approximately 10–15% of all known or suspected pregnancies.

**Threatened abortion** involves vaginal bleeding with or without cervical dilatation. The symptoms may resolve and a viable pregnancy may continue. If the symptoms continue, the pregnancy will result in an inevitable, complete or incomplete abortion.

**Unsafe abortion** refers to the termination of pregnancy by persons lacking the necessary skills or in an environment lacking the minimal standards of care or both.

**Abscess** — A localized collection of pus in any part of the body due to infection.

**AIDS** — Acquired immune deficiency syndrome.

**Amnion** — The innermost of the membranes enveloping the baby in the uterus and which produces and contains the amniotic fluid.

**Amniotic fluid** — The fluid produced and contained within the amnion. During the latter half of pregnancy it also contains fluid from the fetal lungs and kidneys. This fluid provides space for unimpeded fetal growth and, in late pregnancy and in labour, it equalizes the pressure exerted by contractions, equalizes the temperature and provides some nutritive substances for the fetus.

**Amniotic fluid embolism** — This rare but often fatal condition is caused by amniotic fluid entering the maternal circulation via the uterine sinuses of the placental bed. It is most likely to occur in labour or in the immediate postpartum period, following very strong contractions. Symptoms and signs include cyanosis, chest pain, dyspnoea, blood-stained, frothy sputum, convulsions and collapse.

**Amniotomy** — Surgical rupture of the fetal membranes to induce labour.

**Anaemia** — A reduction in the number of red blood cells or in the amount of haemoglobin present in them. Anaemia can be caused by excessive blood loss, or by not eating enough foods rich in iron or folic acid. Other causes are excessive breakdown of red cells (e.g. in malaria), or failure to manufacture them

**Analgesic** — A drug given to relieve pain.

**Aneurysm** — A sac formed by the dilatation of the wall of an artery.

**Anoxia** — A state of being deprived of oxygen.

**Antepartum** — Before delivery.

**Antepartum haemorrhage** — Bleeding from the genital tract at any time after the 22nd week of pregnancy and before the birth of the baby. There are two main causes of antepartum haemorrhage, placenta praevia and abruptio placentae.

**Anterior** — Situated in front or directed towards the front.

**Antero posterior** — From front to back.

**Antibiotic** — Drugs derived from living micro-organisms which destroy or inhibit the growth of pathogenic bacteria. They are given to treat infection.

**Antibody** — A protein produced in the body to fight micro-organisms or foreign substances which may enter the body. In pregnancy, maternal antibodies to specific conditions are transferred across the placenta to the fetus. This gives the baby a passive immunity to some diseases in the first few months of life.

**Anticonvulsant drug** — A drug which controls convulsions.

**Antihypertensive** — A drug given to reduce high blood pressure.

**Antipyretic** — A drug given to reduce fever.

**Antiseptic** — A substance that prevents infection by killing certain bacteria on skin or body tissues. Antiseptics include surgical spirits, chlorhexidine and iodine.

**Anuria** — No urine is produced by the kidneys. This life-threatening condition may be associated with obstetric emergencies such as severe haemorrhage, eclampsia and septic shock.

**Apex** — The top or highest point.

**Apnoea** — Absence of breathing.

**Aseptic technique or asepsis** — Aseptic technique refers to special precautions taken to achieve a bacteria-free environment, e.g. at delivery or at surgical operations. Precautions include use of the correct hand-washing technique, correct use of sterile instruments and drapes, the wearing of appropriate clothing by staff, e.g. gown, cap and gloves.

**Asphyxia** — A condition in which there is a deficiency of oxygen in the blood and an increase in carbon dioxide. If the baby fails to breathe at birth, it suffers from asphyxia and requires urgent resuscitation.

**Asymmetrical** — Unequal size or shape of two normally similar structures. The pelvis may be asymmetrical if distorted by disease, injury or congenital malformation.

**Atonic** — Lack of muscle tone.

**Atonic postpartum bleeding** — Occurs from the placental site because the uterus is unable to contract adequately and thus the blood vessels are not compressed and bleeding is not controlled. Any condition that interferes with uterine contraction, such as a retained placenta, will predispose to atonic bleeding.

**Augment** — To increase: in augmented labour, oxytocin may be used to increase the effectiveness of contractions if progress is slow.

**Avoidable factors** — Factors causing or contributing to maternal death where there is departure from generally accepted standards of care.

**Axilla** — The armpit.

# B

**Bacteria** — Microscopic, unicellular organisms which, if pathogenic, can cause disease. They reproduce extremely quickly, thus can rapidly multiply in the body.

**Bacteriuria** — Presence of bacteria in the urine

**Bandl's ring** — The area between upper and lower uterine segments when it becomes visible and/or palpable during obstructed labour. It is caused by the extreme thickening of the upper segment and the dangerous thinning of the lower segment and is a sign of impending rupture of the uterus.

**Bartholin's glands** — Two small mucous-producing glands, one on each side of the vaginal orifice.

**Bimanual compression of uterus** — A manoeuvre to arrest severe postpartum haemorrhage after delivery of the placenta when the uterus is atonic. The right hand is inserted into the vagina and closed to form a fist which is placed in the anterior vaginal fornix. The left hand is pressed deeply into the abdomen behind the uterus, applying pressure against the posterior wall of the uterus. Pressure is maintained until bleeding is controlled.

**Bolus** — A dose of a pharmaceutical preparation which is given all at once.

**Broad ligament** — Two folds of peritoneum draped over the uterus which extend to the side walls of the pelvis and help to keep the uterus in its place. They contain the uterine tubes, parametrium, blood vessels and nerves.

## C

**Capsular decidua** — The part of the decidua which lies over the developing embryo during the first 12 weeks of pregnancy.

**Caput succedaneum** — Swelling of the fetal scalp due to pressure from the cervix. The swelling may be exaggerated in obstructed labour.

**Cavity** — A hollow place or space in the body.

**Cephalic presentation** — The head (i.e. cephal) lies in the lower pole of the uterus.

**Cephalopelvic disproportion** — A misfit between the fetal head and the pelvis through which it has to pass. It may be caused by a small or abnormally-shaped pelvis, or a large or abnormal baby.

**Cerebral haemorrhage** — Bleeding in the brain due to a ruptured blood vessel.

**Cerebrospinal fluid** — The liquid contained inside the brain and around the spinal cord.

**Cervical os** — The internal os is the opening between the cervix and the body of the uterus and the external os is the opening between the cervix and the vagina. After effacement of the cervix in labour, there is only os and that lies between the lower segment of the uterus and the vagina.

**Chorioamnionitis** — Infection of the membranes that envelop the fetus in the uterus.

**Chorion** — The outermost of the two membranes which envelope the fetus in the uterus.

**Chronic** — Prolonged or permanent.

**Circulatory overload** — Overloading the circulation. This may occur in cases of excessive intravenous infusion of fluids. It leads to respiratory problems due to an accumulation of fluid in the lungs and to cardiac failure.

**Coagulation** — Formation of a blood clot.

**Coagulation failure** — Disturbance of the coagulation system resulting in widespread formation of clots, mainly in the capillaries. Eventually haemorrhage occurs because all the clotting factors are depleted. These events result in ischaemic damage within the body organs and, unless urgent treatment is instituted, will result in death. It is triggered by certain conditions which introduce coagulation-promoting factors into the circulation, e.g. abruptio-placentae, severe pre-eclampsia and eclampsia, retained dead fetus after several weeks, amniotic fluid embolism and some very severe infections.

**Coccyx** — The small bone at the end of the sacrum which is formed by four fused vertebrae. It forms a movable joint with the sacrum and moves backwards out of the way during vaginal delivery, thereby increasing the size of the pelvic outlet.

**Coma** — A state of unconsciousness from which the person cannot be aroused. The person is said to be in a coma or comatose.

**Contraction** (of pelvis) — Reduction in size.

**Cortical necrosis** — Death of the outer part of the substance of an organ (e.g. the kidney).

**Crepitations** — Dry, crackling sound.

**Cross-matching** (of blood) — A test of the compatibility of donor and recipient blood performed before transfusion.

**Crowning** — The moment during birth when the widest presenting diameter of the fetal skull distends the vaginal orifice and the head no longer recedes between contractions.

**Cubital fossa** — The depression in the part of the arm which is in front of the elbow.

**Cyanosis** — A bluish discolouration of skin and mucous membranes due to lack of tissue oxygenation.

**Cystitis** — Infection of the urinary bladder.

# D

**Decidua** — The name given to the endometrium (innermost layer) of the pregnant uterus. The part of the decidua that is underneath the placenta is the decidua basalis. The part that lines the uterus elsewhere than at the site of placental attachment is the decidua vera or parietalis.

**Deep vein thrombosis** — The formation of a thrombus (clot) in a deep vein, most commonly in the leg or pelvis. It causes swelling and pain when walking. If a clot detaches itself from the wall of the vein it may be carried in the blood-stream to the heart or lungs causing collapse and, unless immediate resuscitation is successful, death.

**Deficiency** — A lack of.

**Deflexed** (head) — Erect head, rather than a flexed head with the chin on the chest. occurs in occipito-posterior positions and may cause prolonged labour because larger presenting diameters of the fetal head have to pass through the pelvis.

**Deformity** — Distortion of any part of the body. Malformation.

**Dehydration** — Condition caused by excessive loss of body fluid or by an inadequate intake of fluid. Signs of dehydration include dry mouth, thirst, sunken eyes, skin pinch goes back slowly and reduced urinary output.

**Delirium** — Disordered state of mind with incoherent speech, hallucinations and excitement. Commonly occurs with high fever.

**Diameter** — A straight line passing through the centre of a circle or sphere. A number of diameters of the pelvis and fetal skull are described and appropriate measurements given.

**Differential diagnosis** — Deciding which of two or more conditions may be the cause of symptoms and signs noted.

**Direct obstetric death** — A death resulting from obstetric complications of the pregnant state (i.e. pregnancy, labour and puerperium), from interventions, omissions, incorrect treatment, or a chain of events resulting from any of the above.

**Disseminated intravascular coagulation** — Disturbance of the coagulation system triggered by certain conditions (e.g. septic or haemorrhagic shock, eclampsia) and characterized by generalized bleeding. (See coagulation failure).

**Distended** — Stretched.

**Distortion** — The state of being twisted out of normal shape.

**Diuresis** — Passing increased amounts of urine.

**Diuretic** — A drug that is given to increase the production of urine.

**Dorsal position** — Lying on the back.

**Drowsy** — Half asleep, dozing.

**Dysentery** — Infection in the intestines due to bacteria or parasites, causing pain in the abdomen and frequent stools containing blood, pus or mucous.

# E

**Eclampsia** — A condition peculiar to pregnancy or a newly delivered woman, characterized by fits followed coma. The woman usually has hypertension and proteinuria. The fits may occur in the antepartum, intrapartum or early postpartum periods.

**Empathy** — Intellectual and emotional awareness and understanding of another person's thoughts, feelings and behaviour, even those that are distressing and disturbing.

**Endocarditis** — Inflammation of the membrane lining the cavities of the heart.

**Endometritis** — Infection of the endometrium (inner lining of the uterus).

**Endometrium** — The innermost layer of the uterus.

**Engorged breasts** — Painful accumulation of secretion in the breasts, often accompanied by lymphatic and venous stasis and oedema at the onset of lactation. Frequent feeding and ensuring that the baby is correctly positioned at the breast helps to relieve the condition.

**Epigastric** — The upper middle region of the abdomen.

**Episiotomy** — A cut made in the perineum just before the head crowns to facilitate delivery. It should not be a routine procedure, but only performed for fetal distress to speed up the birth, before complicated vaginal deliveries, e.g. breech, shoulder dystocia, and for preterm infants to relieve the pressure on their soft skulls, thereby reducing the risk of cerebral injury.

**Essential hypertension** — High blood pressure occurring without discoverable cause.

**Expansile** — Capable of stretching.

**Extend the knee** — To straighten the leg.

**Extension** (head) — Lengthening. It is the opposite of flexion. Used to describe the mechanism by which the head is born, i.e. after flexion, the head extends to allow the forehead, face and chin to be born.

**External** — Situated on the outside.

# F

**False labour** — Painful uterine contractions which are not accompanied by cervical effacement and dilatation. Contractions often irregular and cease spontaneously after a few hours.

**Fatal** — Ending in death.

**Fetal sac** — The bag of membranes which envelop the baby in the uterus.

**Feto-maternal transfusion** — Passage of fetal blood into the blood circulation of the mother, through the placenta.

**Fibroids** — A benign tumour of the myometrium (muscle of the uterus).

**Fistula** — An abnormal passage or communication between two organs such as, for example, the urinary bladder and the vagina, i.e. a vesico-vaginal fistula, or the vagina and the rectum, i.e. recto-vaginal fistula. It is a serious complication of obstructed labour and results in urinary or faecal incontinence. Operative repair is usually required.

**Flexed** — Bent forward.

**Flexible** — Pliant, i.e. bends easily.

**Flexion** (head) — Head is bent forward.

**Fluctuating** — Giving the sensation of wavelike motion on palpation, due to a liquid content (e.g. pus in an abscess).

**Foaming** — Collection of small bubbles formed in liquid by agitation; froth. Foaming at the mouth: occurs during a fit due to saliva and mucus bubbles.

**Fontanelle** — A membranous space on the baby's head where two or more sutures meet. Often called the 'soft spots.' The **anterior fontanelle** is the diamond-shaped membranous space on the front part of the head at the meeting of four suture lines. The **posterior fontanelle** is the small triangular membranous space on the back part of the head at the meeting of three suture lines.

**Fundus** — The rounded upper part of the uterus, above the insertion of the fallopian tubes.

# G

**Genital mutilation** — The traditional surgical practice of cutting away part or all of the external genitalia of a woman. In the most extreme form, called "infibulation", the two sides of the vulva are also stitched together to leave a very small opening.

**Genital tract** — The pathway formed by the genital organs including the uterine tubes, uterus, cervix, vagina, vulva.

**"Gishiri" cut** — A traditional practice among the Hausa people of Nigeria whereby the vagina is cut to facilitate delivery when labour is obstructed.

**Glycosuria** — The presence of glucose (sugar) in the urine.

**Grand mal epilepsy** — A major epileptic fit followed by loss of consciousness.

**Grand multiparity** — A woman who has borne five or more children.

**Groin** — The junctional region between the abdomen and the thigh.

**Grouping** (of blood) — Determining blood type (A, B, O, AB).

# H

**Haematemesis** — The vomiting of blood.

**Haematocrit** — The percentage volume of packed red cells in a blood specimen. This measurement is obtained by centrifugation (spinning very fast) of the specimen. It is a screening test for anaemia.

**Haematoma** — A localized collection of blood in an organ or tissue due to blood leaking from a blood vessel.

**Haemoglobin** — The substance in red blood cells which carries oxygen from the lungs to the tissues.

**Haemoglobinopathies** — Disorders of the blood caused by abnormal forms of haemoglobin (e.g. sickle cell anaemia, thalassaemia). Severe anaemia occurs in these conditions.

**Haemolytic anaemia** — Anaemia caused by destruction of red blood cells, as in malaria. Haemolytic disease of the newborn may occur as a result of rhesus incompatibility. These babies may require an exchange transfusion after birth.

**Haemorrhage** — Excessive bleeding from a torn or severed blood vessel. It may occur externally or within the body.

**Hemiplegia** — Paralysis of one side of the body.

**HIV** — Human immune deficiency virus.

**Hollow** (of the sacrum) — The concave anterior surface of the sacrum.

**Humerus** — The bone that extends from the shoulder to the elbow.

**Hydatidiform mole** — An abnormal pregnancy resulting in a mass of cysts resembling a bunch of grapes. Termination of pregnancy is required and follow-up is essential because of the risk of chorion carcinoma developing.

**Hydration** — The absorption of or combination with water.

**Hydrocephalus** — A condition characterized by accumulation of cerebrospinal fluid within the ventricles of the brain. The baby with hydrocephalus has an enlarged head and a prominent forehead. Severe cases are incompatible with life, but mild cases may be treated by an operation which diverts excess fluid from the brain into the blood stream.

**Hyperemesis gravidarum** — Excessive vomiting during pregnancy. It is a serious condition which causes dehydration and ketosis and the woman will deteriorate quickly unless appropriate treatment is given. Liver and renal damage may occur leading to coma and death.

**Hypertension** — High blood pressure.

**Hypertonic** — Excessive tone. Hypertonic uterine contractions are abnormal and extremely painful, with only a short interval between them. Usually result in fetal distress and may cause rupture of the uterus. Often associated with prolonged and difficult labour, or excessive use of oxytocic drugs to augment or induce labour.

**Hyponatraemia** — Insufficient sodium (salt) in the blood.

**Hypovolaemia** — Abnormally low volume of blood circulating in the body. This can happen when the body loses a lot of blood (e.g. in postpartum haemorrhage).

**Hypoxia** — A diminished oxygen supply to the tissues.

# I

**Idiopathic** — With no known cause.

**Idiopathic thrombocytopenia purpura** — Condition of unknown cause characterized by a decrease in the number of blood platelets resulting in inability of the blood to coagulate properly.

**Imminent** — Soon to happen.

**Incision** — A surgical cut.

**Indirect obstetric death** — A death resulting from previous existing disease or disease which developed during pregnancy and which was not due to direct obstetric causes, but which was aggravated (or made worse) by the physiological effects of pregnancy.

**Induced labour** — A labour that is started artificially by the use of oxytocic drugs and/or by rupturing the membranes.

**Infarct** — An area of necrosis (dead tissue) in an organ caused by local ischaemia, (i.e. poor blood supply). Placental infarcts may be seen, especially in cases of hypertension in pregnancy.

**Infertility** — Difficulty or inability to conceive.

**Infiltration** (of local anaesthetic) — Method of injecting a local anaesthetic into the tissues. Infiltration of the perineum is carried out before an episiotomy is made.

**Internal** — On the inside.

**Intrapartum** — Occurring during childbirth.

**Intraperitoneal** — Within the peritoneal cavity.

**Intrauterine death** — Death of the fetus in the uterus.

**Intrauterine growth retardation (IUGR)** — Poor fetal growth in the uterus. The reason is not always known, but it is more likely in cases of malnutrition, anaemia, pre-eclampsia, malaria, tuberculosis and in women who smoke.

**Involution of the uterus** — Uterus returning to normal size after delivery. Involution occurs by autolysis, (i.e. breaking down) and ischaemia (i.e. reduced blood supply) of excess muscle fibres. It starts soon after birth and is completed within about six weeks.

**Ischial spines** — The two small protuberances of the pelvis that project into the pelvic cavity and can be felt laterally upon vaginal examination.

**Isthmus** The narrow connection between the body of the uterus and the cervix.

# K

**Ketoacidosis** A state of electrolyte imbalance with ketosis and lowered blood pH. It may occur in labour if the woman becomes dehydrated and ketotic. The woman with ketosis has sweet or fruity odour to her breath. Treatment is to rehydrate the woman, giving adequate fluid and carbohydrate.

**Ketonuria** The presence of ketone bodies in the urine.

**Kyphosis** Abnormally increased convexity in the curvature of the thoracic spine as viewed from the side.

# L

**Laparotomy** Incision through the uterine wall to enter the peritoneal cavity.

**Lateral** To the side.

**Leukopenia** An abnormal decrease in the number of white blood cells which are the cells in the blood which fight infection.

**Liquor** Another word for amniotic fluid.

**Lithotomy poles** Special poles attached to either side of a delivery bed or theatre table. They have slings which are used to support the woman's legs during certain procedures which are carried out in the genital area, e.g. vacuum extraction, perineal suturing.

**Lithotomy position** The woman lies down on her back with legs wide apart and supported by the slings which hang on the lithotomy poles.

**Lochia** The discharge from the uterus after childbirth. It consists of blood, mucus, shreds of decidua and other debris from the uterus. During the first 2–3 days it consists mainly of blood, then changes to a pinky/brown colour and contains more serous fluid. Finally it changes to a whitish colour and consists mainly of white blood cells and mucus. The lochia lasts for 2–3 weeks after the birth. Persistent red, profuse lochia may be associated with retained products of conception. Foul-smelling lochia is a sign of infection.

**Loin** The part of the back between the thorax and the pelvis.

**Lumbar puncture** The procedure whereby a hollow needle is inserted into the subarachnoid space between the third and fourth lumbar vertebrae to obtain a specimen of cerebrospinal fluid for examination, and to measure the pressure within the fluid. It may also be carried out for spinal anaesthesia

# M

**Malar bones** — The cheek bones.

**Malnutrition** — Inadequate nourishment resulting from a poor diet or from a defect in metabolism that prevents the body from using its food properly. The symptoms of malnutrition are physical weakness, lethargy and a sense of detachment from reality. In starvation there may be oedema, abdominal distension and excessive loss of weight. In addition there are signs of multiple vitamin deficiency.

**Marginal** — Borderline.

**Mastitis** — Infection of the breast. A wedge-shaped area of the breast becomes tender, red and hot and the woman feels generally unwell. The infection responds well to treatment with antibiotics. If untreated, it may lead to breast abscess.

**Mastoiditis** — Infection of the bone behind the ear. This can be a complication of otitis media (middle ear infection).

**Meconium** — A dark green material present in the intestines of the full-term fetus. It consists of bile-pigments and salts, mucus, epithelial cells and often some amniotic fluid. It is the first stool passed by the baby and continues for a day or two. Occasionally it is passed in utero when it may be a sign of fetal distress.

**Median** — Situated in the midline of a body or structure.

**Median cubital vein** — The vein situated in the midline of the cubital fossa.

**Medical audit** — Official examination of medical records.

**Meningitis** — Infection of the membranes enveloping the brain.

**Mental retardation** — Delayed mental development.

**Mento vertical diameter** — The distance between the chin and the vertex (highest point) of the head.

**Mid-biceps** — Halfway down the biceps (the muscle on the inside of the upper arm).

**Monoplegia** — Paralysis of one limb (arm or leg).

**Moulding** (of the fetal head) — Overlapping of fetal skull bones at the sutures and fontanelles to allow the bones to adapt to the pelvis through which it is passing. The presenting diameter is decreased and the diameter at right angles increased. If moulding is excessive (e.g. in obstructed labour), in the wrong direction, as occurs in malpositions and malpresentions, or occurs too quickly, there is a danger of intracranial haemorrhage.

**Multipara** — A woman who has borne more than one viable child.

**Multiple pregnancy** — A pregnancy of more than one fetus, such as in the case of twins or greater multiples.

**Myometrium** The muscle layer of the uterus.

# N

**Nape** The back of the neck.

**Necrosis** Death of tissues.

**Normal saline** A solution of 0.9% sodium chloride (salt) that may be given in an intravenous infusion.

**Nullipara** A woman who has never borne a viable child.

# O

**Obesity** Excessive fat throughout the body. Weight gain increases beyond that which is considered desirable with regard to age, height and bone structure. In pregnancy the obese woman is at greater risk of complications such as hypertension.

**Oblique** Slanting, inclined, diagonal.

**Obstructed labour** A labour in which progress is arrested by mechanical factors and delivery is impossible without operative intervention.

**Occipito frontal diameter** The distance between the bridge of the nose and the occipital protuberance (i.e. the prominence which can be felt on the occipital bone at the back of the head). It is the presenting diameter when the head is deflexed and measures 11.5 cm.

**Occiput** The area of the head which lies below the posterior fontanelle to the junction with the neck.

**Oedema** An excess of fluid in the tissues of the body. It causes excessive weight gain and swelling which pits on pressure. In pregnancy it is a common feature affecting the feet and ankles, but may also affect the hands, face and become generalized. It is no longer considered a significant sign of pre-eclampsia because some oedema is a common feature in so many pregnancies.

**Offensive** Smelling very bad.

**Oliguria** Diminished secretion of urine. It may be associated with impaired renal function following severe complications such as haemorrhage, pre-eclampsia and eclampsia and septic shock.

**Os** An opening
A bone.

**Osteomalacia** Adult rickets. It is caused by a gross deficiency of vitamin D which results in painful softening of the bones.

**Otitis media** Infection of the middle ear. Usually happens as a complication of an upper respiratory tract infection. Symptoms include pain in the ear and fever.

**Oxygen** A colourless, odourless gas which is essential for life. It constitutes 21% of the atmosphere and is drawn into the lungs during the process of breathing. It then circulates in the blood to oxygenate all the tissues of the body. Lack of oxygen, (hypoxia) causes cyanosis , when the skin and mucous membranes have a bluish colour. Anoxia (no oxygen) causes death and is a common cause of perinatal death.

**Oxytocic** Term applied to any drug which stimulates contractions of the uterus in order to induce or accelerate labour, or to prevent or treat postpartum haemorrhage.

# P

**Parametritis** Infection of the parametrium.

**Parametrium** Connective tissue around the lower part of the uterus. It fills in the spaces between the uterus and related organs.

**Parity** The number of viable children a woman has borne.

**Partograph** A record of all of the clinical observations made on a woman in labour, the central feature of which is the graphic recording of the dilatation of the cervix, as assessed by vaginal examination, and descent of the head. It includes an alert and action line which, if crossed when recording cervical dilatation, indicates that labour is progressing more slowly than normal and intervention is required.

**Patella** The bone situated at the front of the knee, forming the kneecap.

**Pathogenic** An agent or microorganism which causes disease, e.g. pathogenic bacteria.

**Pelvic brim** (or inlet) The pelvic brim is the first part of the true pelvis to be negotiated by the fetus. As a general rule, if the fetal head can enter the pelvic brim, it should be able to pass through the rest of the pelvis.

**Pelvic inflammatory disease (PID)** An infection of the reproductive organs (uterus, fallopian tubes, ovaries, parametrium). The infection may follow delivery or abortion, or it may be secondary to other infections of the genital tract or abdomen, or be a blood borne infection, e.g. tuberculosis. Symptoms include lower abdominal pain, fever, and vaginal discharge. Unless treated early and effectively with antibiotics, the fallopian tubes may be blocked and lead to secondary infertility. The condition may also become chronic.

**Pelvic outlet** The diamond-shaped bony outlet of the pelvis through which the fetus passes at birth.

**Pericarditis** Inflammation of the sac (pericardium) which surrounds the heart.

**Perimetrium** The outermost layer of the uterus. It is draped over the uterus like a sheet and extends to the side walls of the pelvis forming the broad ligaments.

**Perinatal** Around the time of birth.

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| **Perineum** | The area extending from the pubic arch to the coccyx, with underlying tissues. In obstetrics the perineal body is the fibromuscular pyramid between the lower third of the vagina anteriorly and the ischial spines laterally. In the second stage it thins and stretches during the birth of the baby and, in some cases, is torn. |
| **Peritoneal cavity** | The space containing the internal organs of the abdomen. |
| **Peritoneum** | Membrane covering the internal organs of the abdomen and lining the abdominal and pelvic cavity. |
| **Peritoneum, parietal** | Peritoneum lining the abdominal and pelvic cavity. |
| **Peritoneum, visceral** | Peritoneum that covers the abdominal organs, holding them into position. |
| **Peritonitis** | Infection of the peritoneum. |
| **Persistent occiput posterior** | The fetus has its occiput (i.e. back of head) directed towards the back of the maternal pelvis. Usually the head flexes and rotates to an anterior position, but a persistent occipito-posterior position fails to rotate and the baby is delivered face to pubes. Labour is often more difficult in these cases because wider diameters of the fetal head have to pass through the pelvis, contractions may be less effective, cervical dilatation slower, descent of the fetus delayed and injuries to mother and child are more common. |
| **Photophobia** | When light hurts the eyes. |
| **Physical disability** | A physical defect which may limit the individual's capacity to participate fully in normal life. |
| **Pivot** | To turn or swivel on a central point. |
| **Placenta praevia** | An abnormally situated placenta in the lower segment of the uterus which completely or partly covers the os (the opening between the uterus and the cervix). The stretching of the lower segment of the uterus during the last trimester of pregnancy causes some placental separation from the uterine wall. As a result episodes of vaginal bleeding occur which are typically painless. The danger is that the woman will have a catastrophic haemorrhage during late pregnancy. |
| **Placental abruption** | Premature separation of a normally-situated placenta, that is a placenta in the upper segment of the uterus, which occurs after the 22nd week. In this case there may be abdominal pain as well as bleeding. If the bleeding is concealed, i.e. collects behind the placenta, the abdomen will feel hard and be very painful. Shock may be severe and fetal distress is common. |
| **Pleurisy** | Infection of the membrane covering the lungs and lining the walls of the chest. |
| **Polyhydramnios** | A condition characterized by an excess of amniotic fluid. It is associated mainly with multiple pregnancy, fetal abnormality, diabetes and hydrops fetalis, a rare condition caused by severe haemolytic disease. |

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| **Polyuria** | Excessive urination. |
| **Posterior** | Situated at the back of, or in the back part of, a structure. |
| **Postpartum** | After labour. |
| **Postpartum haemorrhage** | Blood loss of 500 ml or more from the genital tract after delivery. The commonest cause is atony (poor muscle tone) of the uterus, or it may be caused by trauma to the genital tract, e.g. tears of the vagina, cervix, or lower segment of the uterus. Postpartum haemorrhage is the commonest cause of maternal death. |
| **Potency** | The power of a medicinal agent to produce its desired effect. |
| **Pouch of Douglas** | The pocket like space between the rectum and the uterus. |
| **Pre-eclampsia** | A condition specific to pregnancy, arising after the 20th week of gestation, characterized by hypertension and proteinuria. Oedema may also be present, but is no longer considered a cardinal sign because it is present to some extent in most pregnancies. If not controlled, pre-eclampsia will lead to eclampsia which is characterized by fits, followed by coma, and has a high mortality rate. |
| **Pre-term baby** | A baby who is born before the 37th completed week of pregnancy. |
| **Precipitate labour** | Labour which progresses unusually quickly. |
| **Primary postpartum haemorrhage** | Excessive bleeding from the genital tract in the first 24 hours after delivery. The amount of blood is 500 ml or more. |
| **Primigravida** | A woman pregnant for the first time. |
| **Primipara** | A woman who has borne one viable child. |
| **Prolonged labour** | Labour which exceeds 12 hours. |
| **Prolonged rupture of membranes** | Ruptured membranes for more than 18 hours, regardless of whether labour has started or not. |
| **Prophylactic** | An agent which is used to try and prevent disease. |
| **Prophylactic antibiotic treatment** | Giving antibiotics to prevent infection. |
| **Proteinuria** | Presence of protein in the urine. Causes are contamination by vaginal discharge, infection or pre-eclampsia. It should always be investigated because, if due to pre-eclampsia, it is a serious sign. If caused by infection, treatment with antibiotics is required. |
| **Pubic arch** | The curved bowlike bony structure which lies at the front of the pelvis. |
| **Puerperal sepsis** | An infection of the genital tract at any time between the onset of rupture of membranes or labour and the 42nd day following delivery or abortion. |

**Puerperium** — The 42–day period following delivery of the baby. Another word meaning the same is "postpartum period".

**Pulmonary embolism** — The blood circulation in the lungs is blocked by an embolus (blood clot).

**Pulmonary oedema** — Accumulation of fluid in the lungs.

**Purpura** — Small haemorrhage in the skin.

**Pyelonephritis** — Infection of the kidneys due to bacteria that have come up from the bladder after entering through the urethra.

# R

**Rales** — A rattling sound heard when listening to lungs that are diseased.

**Recumbent position** — Lying down.

**Resistant bacteria** — Bacteria which are not killed by a drug that usually kills that kind of bacteria.

**Resuscitation** — Bringing back to life or consciousness a person who is apparently dead.

**Retained placenta** — Describes the situation when the placenta has not been delivered within 30 minutes after the birth of the baby.

**Retracted** — Drawn back.

**Retroplacental** — Behind or underneath the placenta.

**Reversal** — A turn or change in the opposite direction.

**Rhesus factor** — An antigen present on the red blood cells of most people. Those having this antigen are classified "rhesus positive". Those that do not have it are "rhesus negative". Rhesus incompatibility occurs when the mother is "rhesus negative" and the fetus is "rhesus positive".

**Rickets** — Softening of bones due to vitamin D deficiency during childhood.

**Risk factor** — Factors which make a condition more likely to happen or more dangerous.

**Rotation** (of fetal head) — The movement of the fetal head as it descends through the birth canal.

**Rupture** — Tearing or bursting of a structure, e.g. rupture of uterus following obstructed labour.

**Ruptured uterus** — Tearing or bursting of the uterus due to obstructed labour.

# S

**Sacral promontory** — The part of the first sacral vertebra which projects into the pelvic inlet.

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| **Sacrum** | The lowest part of the spine. It is formed by five sacral vertebrae. |
| **Sagittal suture** | The membranous line between fetal skull bones (parietal bones) running from the posterior fontanelle to the anterior fontanelle. |
| **Sanitation** | The establishment of conditions favourable to health. It includes the safe disposal of faeces by the use of adequate latrines, to avoid the transmission of diseases. |
| **Scoliosis** | A lateral deviation in the normally straight vertical line of the spine. |
| **Secondary postpartum haemorrhage** | Includes all cases of PPH occurring between 24 hours after delivery of the baby and 6 weeks postpartum. |
| **Segment** | A section or a part of something. |
| **Self-retaining catheter** | A catheter that is left *in situ* in the bladder. |
| **Semiprone position** | Lying down on the left side. |
| **Semi-recumbent position** | Lying down with head and shoulders raised up. |
| **Septic shock** | A very serious infection of the blood stream causing high fever, low blood pressure, fast pulse and fast breathing. Untreated septic shock leads to coma and death. |
| **Septicaemia** | The presence and multiplication in the blood of harmful microorganisms in the blood, causing high fever and chills. Untreated, septicaemia can lead to shock and death. |
| **Shock** | A life-threatening condition characterized by failure of the circulatory system to maintain normal blood flow to vital organs (e.g. kidneys, heart brain).<br><br>***Haemorrhagic shock*** is shock due to low blood volume resulting from excessive blood loss.<br><br>***Septic shock*** is shock due to overwhelming infection and results from the action of the pathogenic bacteria on the vascular system. |
| **Sinciput** | The brow, or forehead. |
| **Sinusitis** | Infection in the sinuses (air cavities in the cranial bones on either side of the nose and above the eyes). |
| **Sitz bath** | Soaking of the genital area in a tub of clean warm water. This may be done in the postpartum to soothe pain from an episiotomy or perineal tear. |
| **Smear** | A specimen of superficial cells, e.g. from the cervix or vagina, which can be examined microscopically and gives information about the level of hormones or early malignant disease. |
| **Sodium lactate** | A solution of sodium lactate, sodium chloride, potassium chloride and calcium chloride which can be given via an intravenous infusion. |
| **Sonar** | A term for ultrasound in medical diagnosis. |

**Spasms** — Sudden, strong, involuntary muscular contractions.

**Specific gravity** — Relative weight of any kind of matter (e.g. urine), expressed by the ratio of the weight of a certain volume of that matter to the weight of the same volume of water. The specific gravity of water is 1.

**Specimen** — A sample or part of a thing taken to determine the character of the whole e.g. specimen of urine.

**Splint** — A strip of rigid material such as wood, used to keep in place a movable body part.

**Sputum** — Matter ejected from the lungs, bronchi and trachea, through the mouth.

**Stasis** (of urine) — Standing still, not flowing properly.

**Stat** — A medical abbreviation meaning "at once".

**Statistics** — A collection of numerical facts.

**Status** — Social position, relative importance of a person.

**Stenosis** (of vagina) — Narrowing of the vagina which is usually due to scarring caused by genital mutilation or unrepaired lacerations.

**Stillbirth** — A baby that is delivered dead (after the 22nd week of pregnancy).

**Stillborn** — A baby that is delivered dead.

**Stunted growth** — When a person is short, often because of insufficient food intake during childhood.

**Subarachnoid haemorrhage** — Bleeding within the membranes enveloping the brain due to a ruptured blood vessel.

**Subinvolution** (uterus) — The uterus is not reducing in size normally, (i.e. is slow to involute) during the early postpartum period.

**Suboccipitobregmatic diameter** (of head) — The distance from beneath the occiput to the anterior fontanelle.

**Symphysiotomy** — A surgical incision of the symphysis pubis to widen the pelvic outlet when there is cephalopelvic disproportion. It is an alternative emergency procedure when facilities for safe caesarean section are not available.

**Symphysis pubis** — The cartilaginous area where the two pubic bones join at the front of the pelvis

# T

**Talipes** — Clubfoot. A congenital abnormality when the foot has developed at an abnormal angle to the leg.

**Tenderness** — Painful when palpated.

**Term baby** — Baby born between 37 and 42 completed weeks of pregnancy.

**Testicles/testes** — The two glands in the scrotum which produce spermatozoa and male sex hormones.

**Tetanus** — A disease caused by microorganisms found in the soil and dust which is spread by animal and human faeces. The microorganisms enter the body through a break in the skin and cause a severe condition with muscle spasm and convulsions leading to death. Because stiffness of the jaw is often the first symptom, it is also known as lockjaw. This severe disease can be prevented by adequate immunization with tetanus toxoid.

**Thorax** — The chest.

**Thrombophlebitis** — Inflammation of a superficial vein together with clot formation. In these cases the clot rarely separates from the wall of the vein and so the risk of embolism is small.

**Thrombosis** — The formation of a blood clot. This occurs in the deep veins and if the clot becomes detached from the vessel wall, there is a serious risk of embolism leading to death.

**Tocolytic agent** — An agent that stops uterine contractions, e.g. ritodrine hydrochloride, salbutamol.

**Traditional birth attendant (TBA)** — Name given to the person who traditionally assists women in childbirth at community level. Most are illiterate and become birth attendants without training, but efforts are now being made to give them basic training for a few weeks, and to encourage them to use basic but essential birthing kits. They are not considered as a "skilled birth attendant", but do have an important role to play in the community to be linked with skilled birth attendants.

**Transient** — Temporary, not lasting a long time.

**Trauma** — Injury.

**Traumatic bleeding** — In obstetrics, occurs as a result of injury to the genital tract.

**Tumour** — A new growth of tissue which could be benign (harmless) or cancerous.

**Twitch** — Sudden, small, involuntary contractions.

# U

**Ultrasound** — Sound at frequencies above the upper limit of normal hearing which is used in obstetrics (and other branches of medicine) in the technique of ultrasonography. It is used to assess the maturity and size of the fetus, locate the site of the placenta, diagnose fetal abnormalities and pelvic tumours.

**Umbilical cord** — The cord which connects the fetus to its placenta. Nourishment and oxygen pass along the umbilical vein from the placenta to the fetus. Waste products pass from the fetus to the placenta via two umbilical arteries.

**Uraemia** An excess of urea in the blood. It is one of the signs of chronic kidney failure.

**Utero vesical pouch** The pocket-like space between the uterus and the bladder.

**Uterus inversion** The uterus is turned inside out, with the fundus of the uterus being forced through the cervix and protruding into or right outside of the vagina. It is a serious obstetric emergency which leads to severe shock. The uterus must be replaced as quickly as possible.

# V

**Vacuum extraction** A procedure in which a metal or plastic cup is attached to the baby's head by creating a vacuum. By gently pulling on the chain leading to the cup during contractions, the baby's head gradually descends through the birth canal. It is important to check that there is no cephalo-pelvic disproportion before attempting a vacuum delivery.

**Vaginal fornix** The space formed between the vaginal wall and the part of the cervix which projects into the vagina. There are four fornices, the anterior, posterior and two lateral fornices.

**Varicose veins** Veins that are abnormally tortuous and distended. If painful during pregnancy, the woman should be advised to wear support stockings which should be applied before the woman rises to her feet in the morning, and to rest with her legs elevated above the level of the heart.

**Venepuncture** The puncture of a vein to get a blood sample or to set up an intravenous infusion.

**Vertex** The area of the head between the anterior and posterior fontanelles and the two parietal eminences (i.e. bumps on each side top of the head. In normal labour when the head is well-flexed, the vertex presents.

**Virus** Small infective agent which grows and reproduces in living cells. Viruses may cross the placenta in pregnancy and cause fetal abnormalities, especially in the first trimester.

**Vitamins** Essential food substances. Vitamins A, all of the B's, C, D, E and K are essential to nutrition and health and deficiencies cause a variety of health problems.

# W

**Waddling gait** Walking with an exaggerated elevation of the hips (rather like a duck walks).

**Water intoxication** The condition caused by excess fluid in the circulation and insufficient sodium. It may be caused by over-transfusion and can lead to nausea, vomiting and, in severe cases, convulsions, coma and death.