Education material for teachers of midwifery

Midwifery education modules - second edition

Managing postpartum haemorrhage

International Confederation of Midwives

World Health Organization

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Ms Gaynor Maclean developed the initial draft of the modules and pretested some of the teaching–learning methods in two African countries. Ms Friederike Wittgenstein prepared the field-testing version of the modules, retaining most of the ideas and methods included in the initial draft. Ms Judith O'Heir developed the field-testing protocol, coordinated the field-testing activities in five countries in Africa, Asia and the Pacific, and completed the modules following field-testing. Ms Barbara Kwast, and later Sister Anne Thompson, both midwives of international repute, were responsible as WHO staff members for the nurturing, development, production and ultimately, the dissemination and use of the modules.

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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 – what the student will be able to do upon completion of each session

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. THIRD STAGE OF LABOUR: PHYSIOLOGY AND MANAGEMENT	Modified lecture, quiz Clinical teaching, supervized practice Discussion	1½ hours ½ hour–1½ hours per 2–3 students 2½ hours
2. UNDERSTANDING POSTPARTUM HAEMORRHAGE	Group work, discussion, modified lecture, demonstration	Approximately 2 hours
3. AVOIDABLE FACTORS	Modified lecture Group work Feedback, discussion	½ hour 1 hour 1½ hours
4. IDENTIFYING THE PROBLEM	Modified lecture, discussion	2 hours
5. MANAGING PRIMARY PPH	Modified lecture	2 hours
6. MANAGING SECONDARY PPH	Modified lecture	1½ hours
7. LEARNING CLINICAL SKILLS	Lecture Clinical teaching, discussion	2 hours Approximately 2 hours per small group of students, per skill, and additional time for individual practice and assessment
8. REPAIR OF CERVICAL AND HIGH VAGINAL TEARS	Modified lecture, discussion, demonstration Clinical teaching and supervision	1 hour Variable, depending on the ability and need of students
9. MANUAL REMOVAL OF THE PLACENTA	Modified lecture, discussion, demonstration Clinical teaching and supervision	1 hour Variable, depending on the ability and need of students
10. CASE STUDIES	Case studies, discussion, group work, feedback Optional tutorials	3 hours 1 hour per student or small group of students
11. DO YOU KNOW?	Learning game Optional tutorials	1½ hours 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 – what the student will be able to do upon completion of each session

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 module, like the other technical modules, is 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 THIRD STAGE OF LABOUR: PHYSIOLOGY AND MANAGEMENT

SESSION 1
THIRD STAGE OF LABOUR: PHYSIOLOGY AND MANAGEMENT

Aims

- To enable students to understand the physiology of the third stage of labour, and apply this understanding to the management of the third stage of labour, in order to ensure safe practice.
- To enable students to understand the issues surrounding the options for management of the third stage of labour.

Objectives

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

- Explain the physiology of the third stage of labour with reference to appropriate anatomy.
- Describe the appearance of the normal placenta and possible malformations.
- Describe how to examine the placenta.
- Explain the active and physiological management of the third stage of labour and demonstrate management under supervision.
- Discuss the issues related to midwifery practice and the management of the third stage of labour.

Plan

Modified lecture, quiz (1½ hours).
Clinical teaching, supervised practice (½ hour–1½ hours per 2–3 students).
Discussion (2½ hours).

Resources

Quiz on the anatomy and physiology of the third stage of labour.
Checklist of sub-tasks for the management of the third stage of labour.

INTRODUCTION

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

Explain that postpartum haemorrhage (PPH) is the most common cause of maternal death in the developing world, accounting for twenty-five per cent of all maternal deaths. This figure refers to cases in which PPH was the direct cause of maternal death. But PPH is often an associated complication in other direct causes such as obstructed labour and sepsis.

It is very important for midwives to be able to prevent PPH, where possible, and manage it promptly if it occurs.

A good understanding of the physiology and management of the third stage of labour helps to promote good practice.

PHYSIOLOGY AND APPLIED ANATOMY

Relative position of the uterus

*Use **Figure 1.1** to show the position of the uterus in relation to the bladder, rectum and vagina.*

In front of the uterus lie the bladder and the utero vesical pouch. Behind are the rectum and Pouch of Douglas. The closeness of the bladder to the uterus explains why a full bladder will interfere with the ability of the uterus to contract after delivery.

Anatomy of the uterus

*Use **Figure 1.2** to show the parts of the uterus.*

The uterus has two main parts: the body and the cervix.

The body: forms the upper two–thirds of the uterus.

The fundus: is the rounded upper part of the body above the insertion of the fallopian tubes.

The isthmus: is the narrow part of the uterus at the junction of the body and cervix. The isthmus becomes thinner and distends during pregnancy and labour to form the lower uterine segment (**Figure 1.3**).

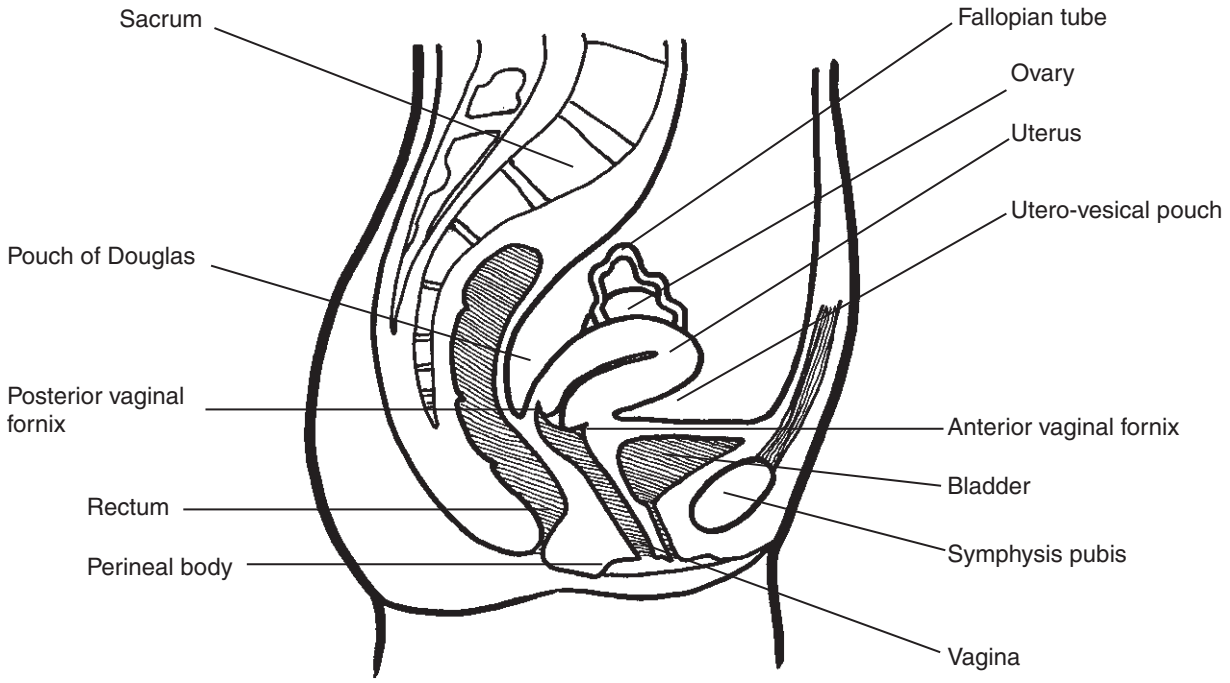


Figure 1.1 A median section through the female pelvis showing bladder, uterus, rectum, and their anatomical relation

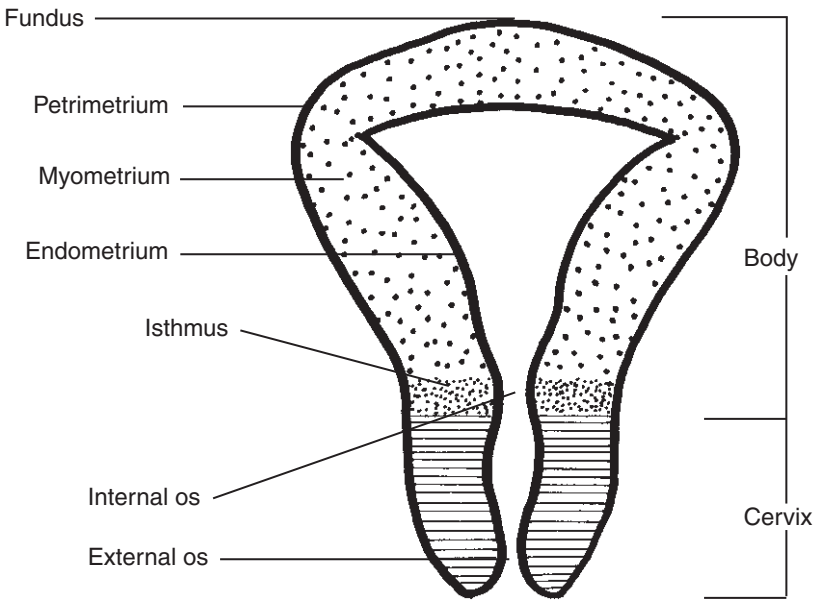


Figure 1.2 The uterus

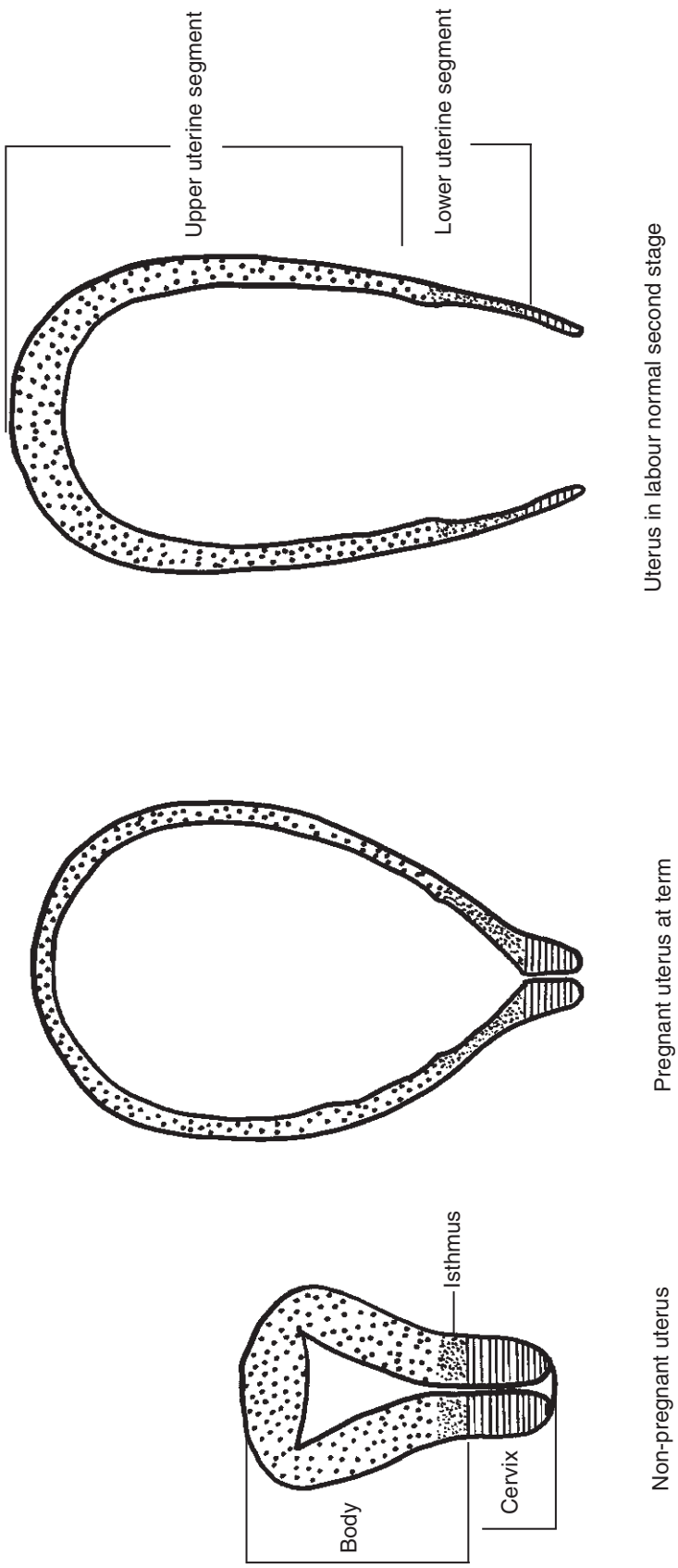


Figure 1.3 Upper and lower uterine segments

The upper uterine segment: is formed by the body of the uterus and it contracts and becomes thicker during labour.

The cervical canal contains a plug of mucus which helps protect against infection. This plug of mucous comes away just before, or as labour commences. Many women refer to this as the "show". The non-pregnant cervix is firm and pink, the pregnant cervix is soft and purple. These changes are caused by increased vascularity and the influence of hormones.

The internal os: is the narrow opening between isthmus and cervix.

The external os: is the opening at the lower end of the cervix. It is small and round before pregnancy, and becomes a transverse slit after pregnancy.

The body of the uterus has three layers: the endometrium, the myometrium and the perimetrium.

The endometrium: is the innermost layer and this is where the fertilized ovum embeds. During pregnancy and childbirth, the endometrium is referred to as the decidua. The part of the decidua that is underneath the placenta is the decidua basalis. The part that lines the remainder of the uterus is the decidua vera or parietalis. The placenta normally embeds only as far as the decidua, although sometimes the whole placenta, or more frequently certain segments of the placenta, embed in the myometrium: in these cases, the placenta or placental fragments are retained in the uterus after childbirth as they are unable to separate in the usual way.

The myometrium: has longitudinal, circular and oblique muscle fibres and is very expansile. The oblique muscle fibres run "criss-cross" and compress the blood vessels when the uterus is well contracted (**Figure 1.4**). During the third stage of labour, the function of the oblique fibres is to constrict strongly and compress the blood vessels to control the bleeding. They are found mostly in the upper segment of the uterus which is where the placenta normally embeds. This explains why bleeding in the third stage is more difficult to control in placenta praevia, where the placenta embeds in the lower segment of the uterus.

The perimetrium: is a layer of peritoneum that covers the uterus except at the sides where it extends to form the broad ligaments.

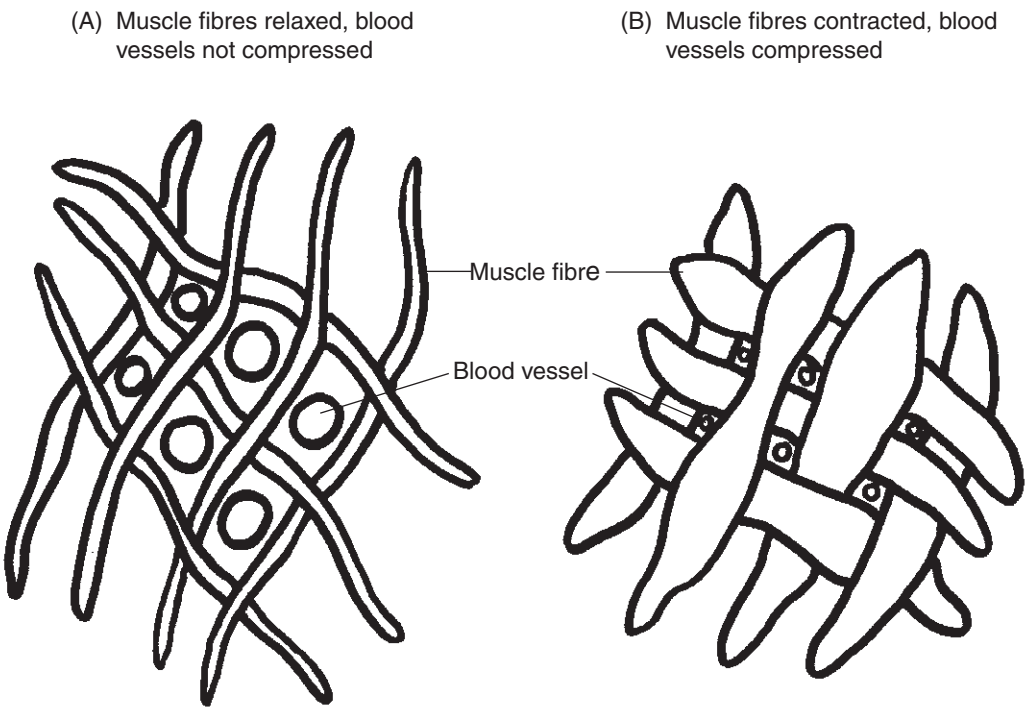


Figure 1.4 Action of the uterine muscle fibres in the control of postpartum bleeding from the placental site

Physiology of the third stage of labour

*Use **Figure 1.5** to **Figure 1.8** to explain the physiology of the third stage of labour.*

Mechanism of placental separation retraction

Separation of the placenta is brought about by contraction and retraction of the myometrium which thicken the uterine wall and reduces the size of the placental area. As the placental area becomes smaller, the placenta begins to tear off the uterine wall because, unlike the uterus, it is not elastic and cannot contract and retract. At the area of separation a clot forms. This clot, known as a retroplacental clot, collects between the decidua and the placenta and further promotes separation. Subsequent uterine contractions completely detach the placenta from the uterine wall and it descends into the lower uterine segment and then into the vagina from where it is expelled.

*Use **Figure 1.9** to show the fundal height relative to the umbilicus at different times during the third stage.*

There are two methods of separation of the placenta which have been described by Schultze and Matthews Duncan (**Figure 1.10**). These methods are not under the control of the birth attendant.

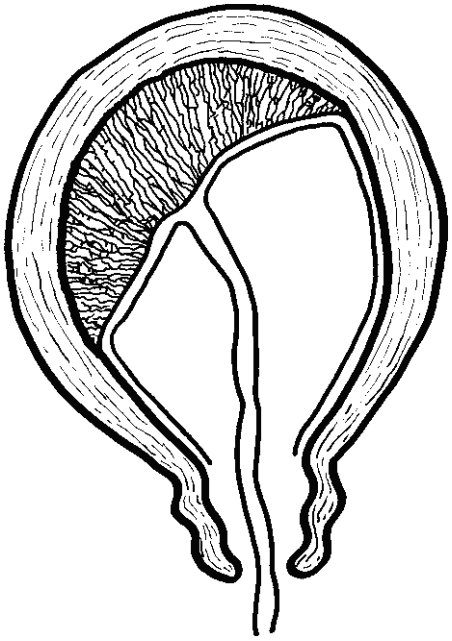


Figure 1.5 Placenta not separated

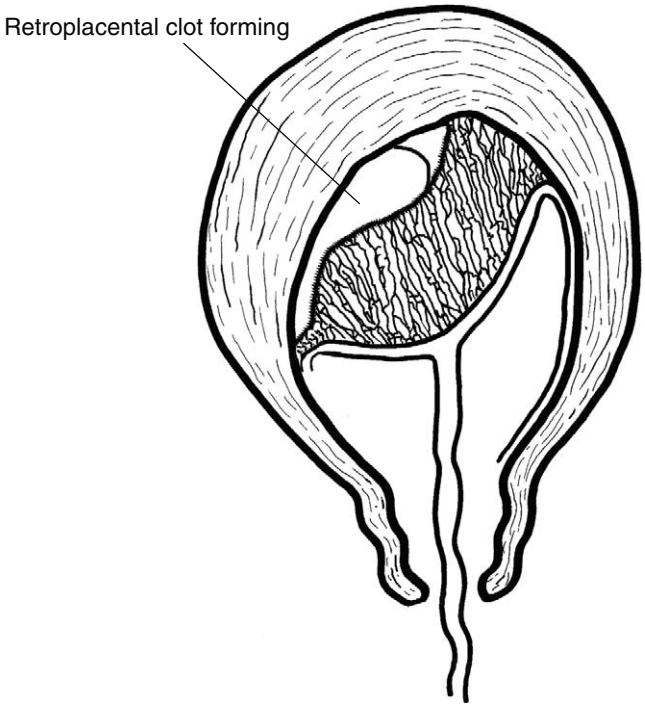


Figure 1.6 Formation of retroplacental clot - placenta begins to separate

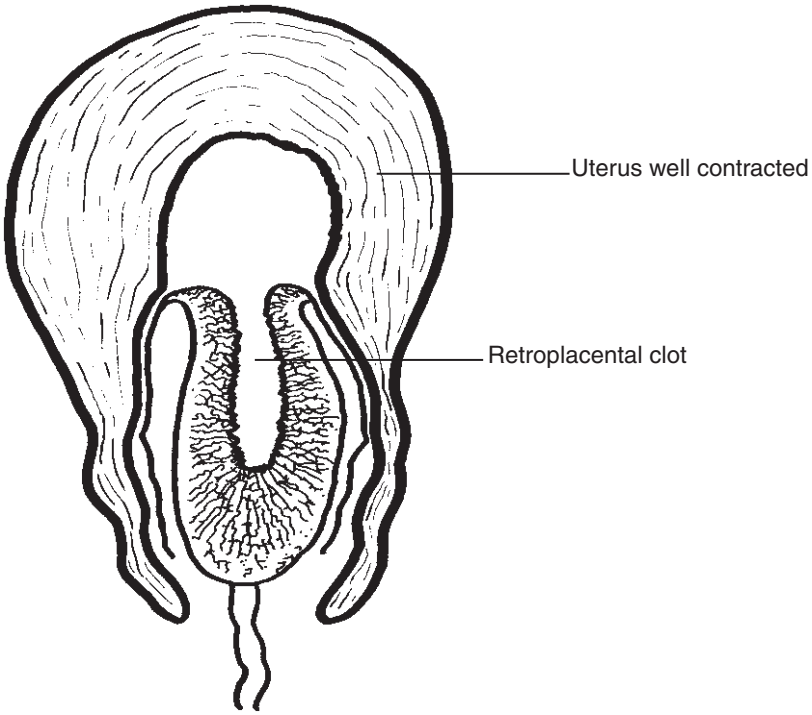


Figure 1.7 Placenta in lower uterine segment

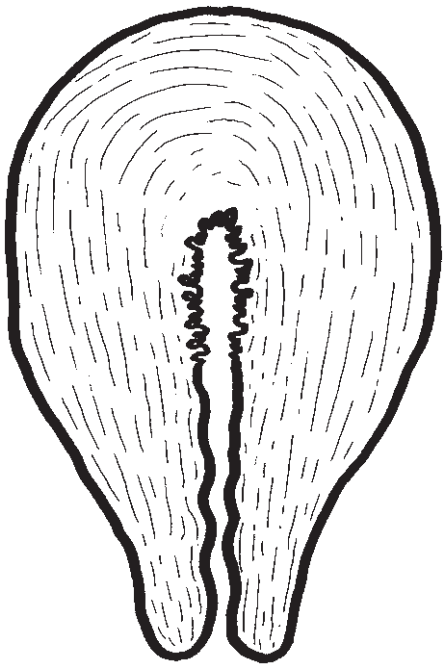


Figure 1.8 End of third stage - placenta expelled and uterus contracted

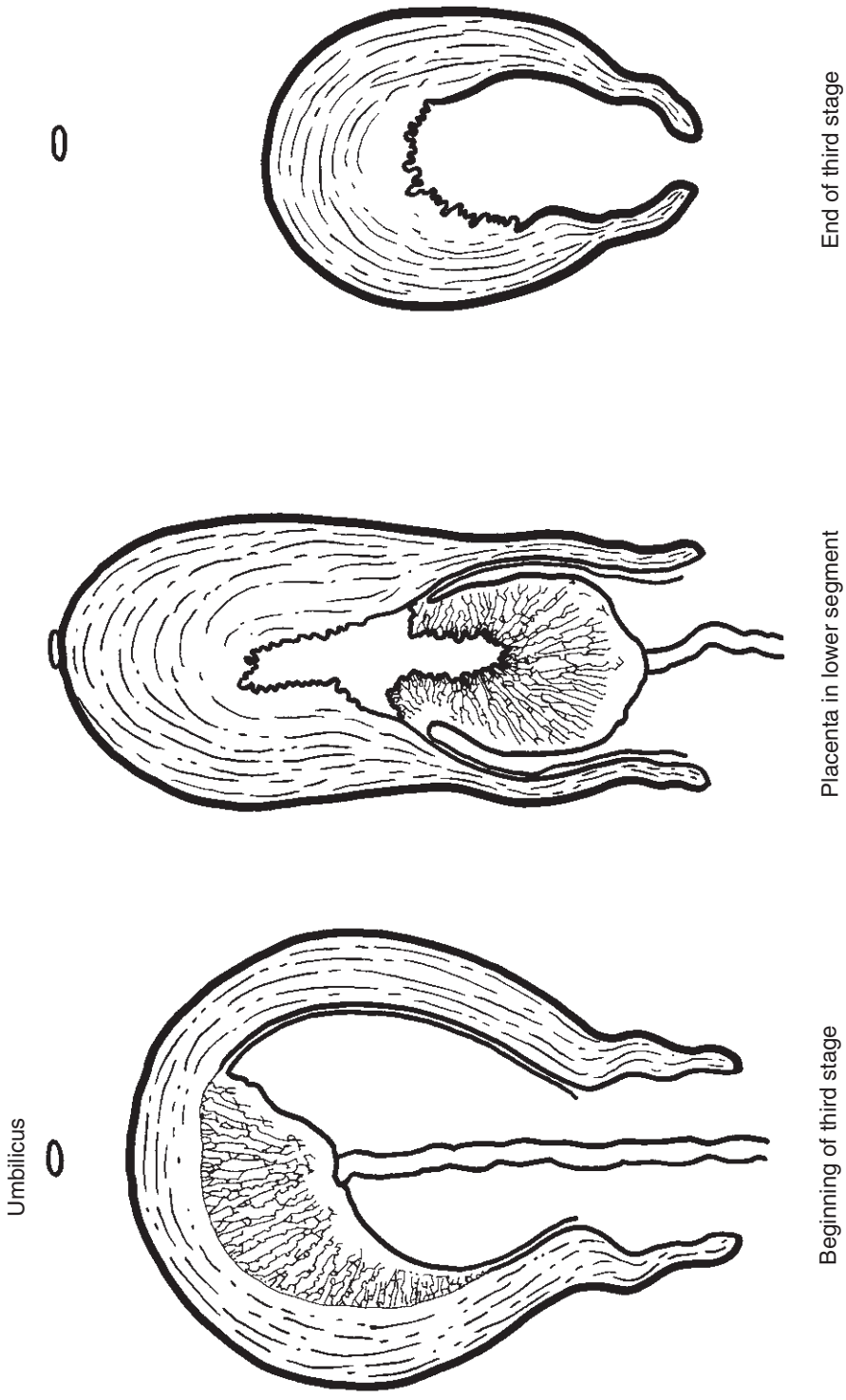


Figure 1.9 Fundal height relative to the umbilicus

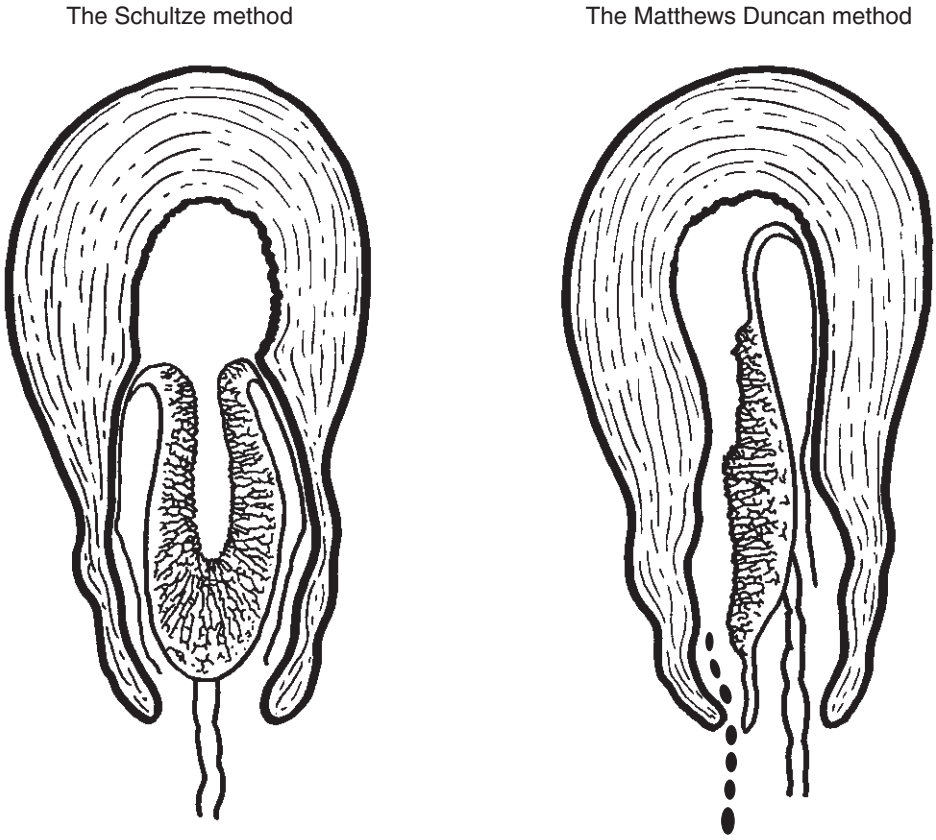


Figure 1.10 Methods of expulsion of the placenta

The **Schultze method** is said to be the more common. The placenta detaches from a central point and slips down into the vagina through the hole in the amniotic sac; the fetal surface appears at the vulva, with the membranes trailing behind like an inverted umbrella as they are peeled off the uterine wall. The maternal surface of the placenta is not seen, and any blood clot is inside the inverted sac.

In the **Matthews Duncan** method, the placenta slides down sideways and comes through the vulva with the lateral border first, like a button through a buttonhole. The maternal surface is seen, and the blood escapes as it is not inside the sac. It is more likely that parts of the membranes will be left behind with the Matthews Duncan method, as they may not be peeled off as completely as in the Schultze method.

The Matthews Duncan method may be associated with a placenta lying lower in the uterus. The process of separation takes longer and blood loss is greater (because there are fewer oblique fibres in the lower segment).

Signs of placental separation

1. The fundus feels hard and globular, and rises abdominally to the level of the umbilicus.

2. The cord lengthens at the vulva.

3. A trickle of blood appears when the placenta separates.

Control of bleeding

500–800 ml of blood flow through the placental site each minute. If there was no mechanism after delivery to control the bleeding, this is how quickly the woman would lose blood. She would bleed to death in a matter of minutes.

The contraction and retraction of the uterine muscle that bring about separation of the placenta also compress the blood vessels strongly and thus control the bleeding. This is possible because of the presence of oblique muscle fibres in the upper uterine segment (**Figure 1.4**). Later, blood clots also form in the torn blood vessels at the placental site, and these too will stop the blood flow.

A full bladder or anything left behind in the uterus after delivery such as placental tissue, membranes or blood clots, interfere with the ability of the uterus to contract and will cause the woman to bleed excessively.

Quiz

You may want to test the students' knowledge and understanding of applied anatomy and physiology of the third stage of labour with the quiz at the end of the session, or devise your own.

1. *Using the quiz in class.*

   Divide the students into four teams and offer them questions in turn, or provide each student with a list of the questions and allow them to search for the answer from available textbooks and/or notes.

2. *Using the quiz before the session.*

   Ask students to update their knowledge by finding the answers in their own time. This could save time, but be sure that students have access to the information they will need.

On completion of this part of the session, ask if there are any questions and summarize.

EXAMINATION OF THE PLACENTA AND MEMBRANES

Appearance of the placenta at term

The placenta is a round, flat mass. The maternal surface is bluish–reddish and made up of lobules which are composed of chorionic villi. It is through these villi that the interchange of substances between the fetal and maternal blood takes place. This interchange occurs without mixing of fetal and maternal blood under normal circumstances.

The fetal surface is smooth, white and shiny branches of the umbilical vein and arteries can be seen running across the surface to the insertion of the umbilical cord. The fetal surface is covered with the amnion which is continued beyond its outer edge to form the membraneous sac that, together with the chorion, contains the fetus and amniotic fluid (**Figure 1.11** and **Figure 1.12**).

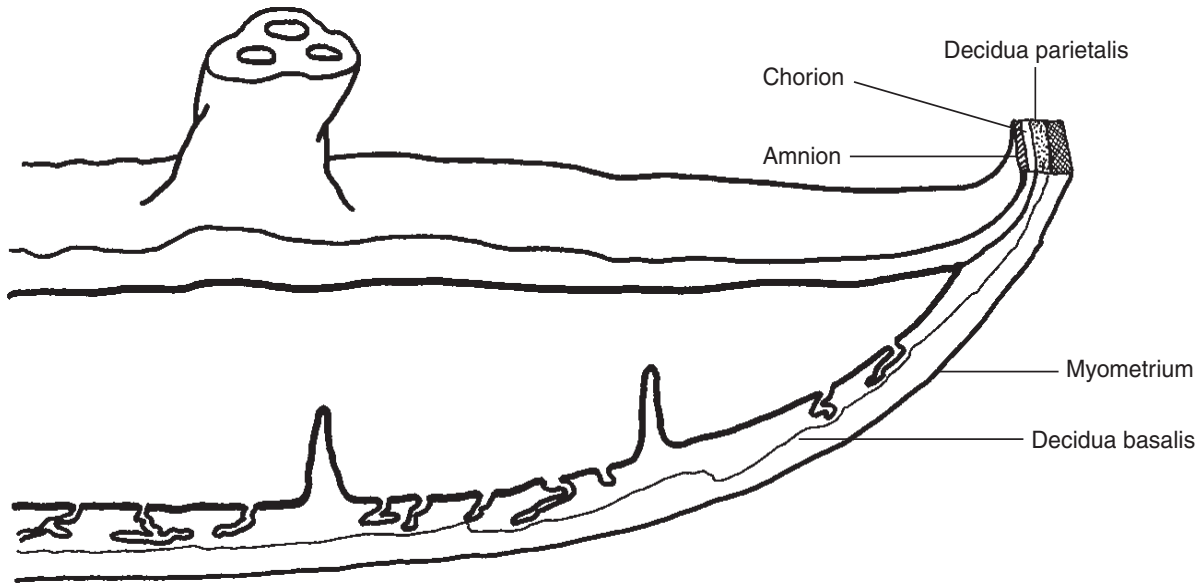


Figure 1.11 Schematic drawing of a section through a full-term placenta

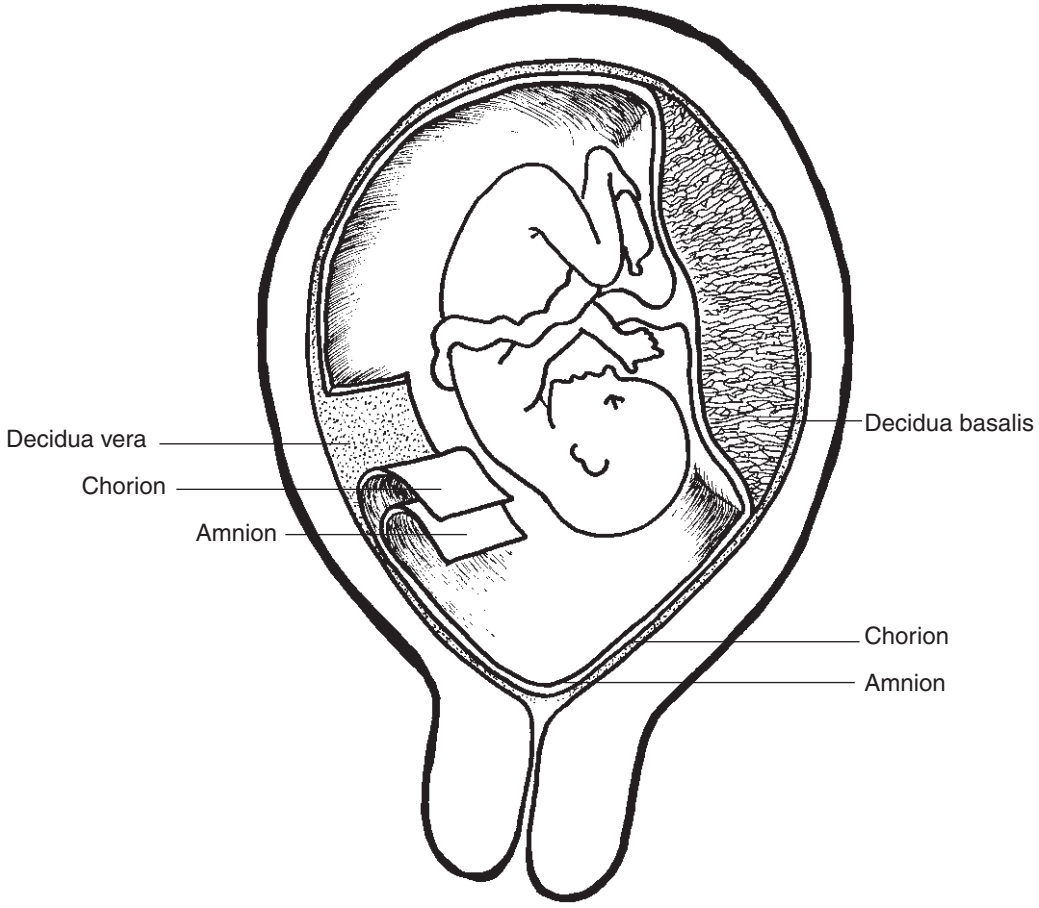


Figure 1.12 The placenta and its membranes

The umbilical cord

The umbilical cord extends from the fetal umbilicus to the fetal surface of the placenta. It usually measures approximately 56 cm in length. It carries three vessels, two arteries containing deoxygenated fetal blood going to the placenta, and one vein containing oxygenated blood going back to the fetus.

The cord is usually inserted in the centre of the fetal surface of the placenta (**Figure 1.13**). Occasionally the cord is inserted into the membranes of the fetal sac some distance from the edge of the placenta. In these cases the umbilical blood vessels run through the membranes between placenta and cord (velamentous insertion) (**Figure 1.14**). This form of insertion is more dangerous because, when membranes of the fetal sac rupture or when an amniotomy is done, the blood vessels may be damaged and bleeding occurs.

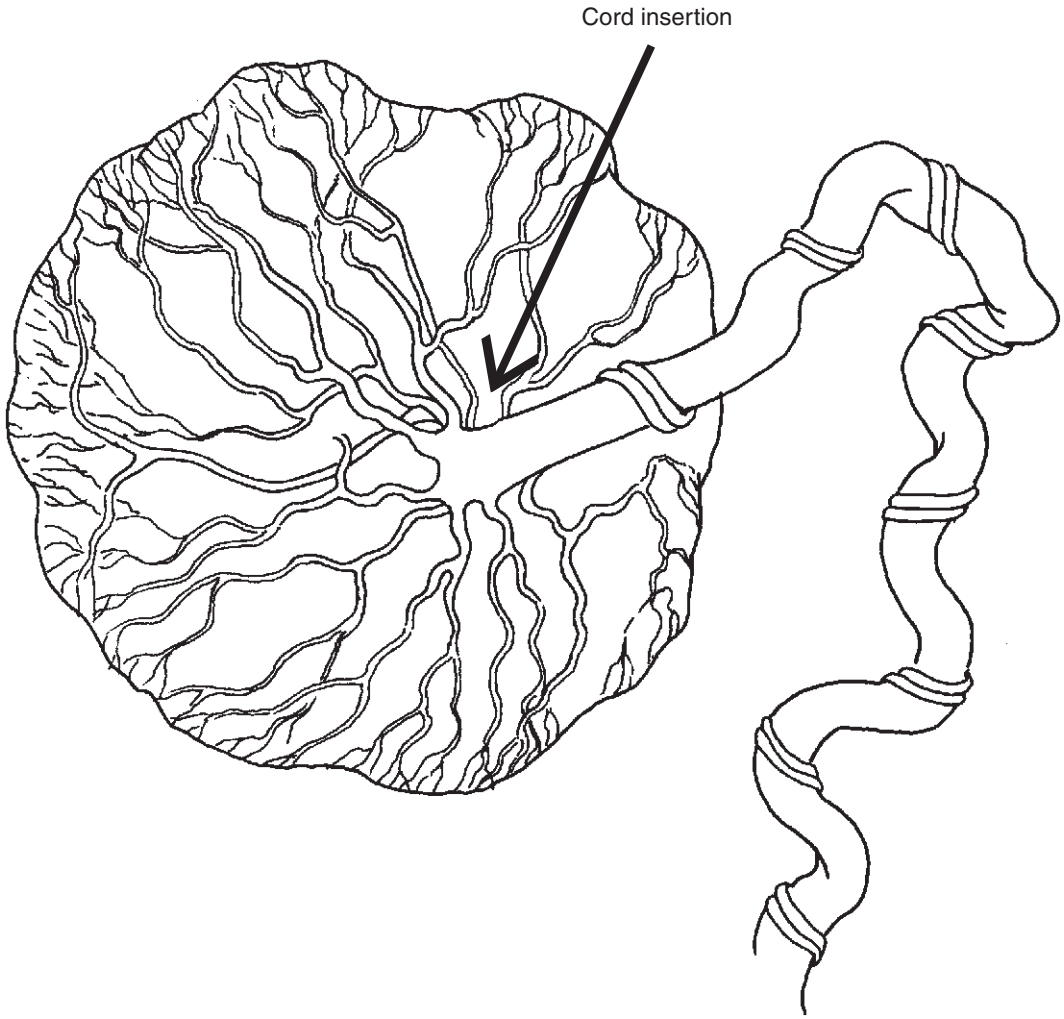


Figure 1.13 Normal cord insertion (the umbilical cord is inserted in the centre of the placenta)

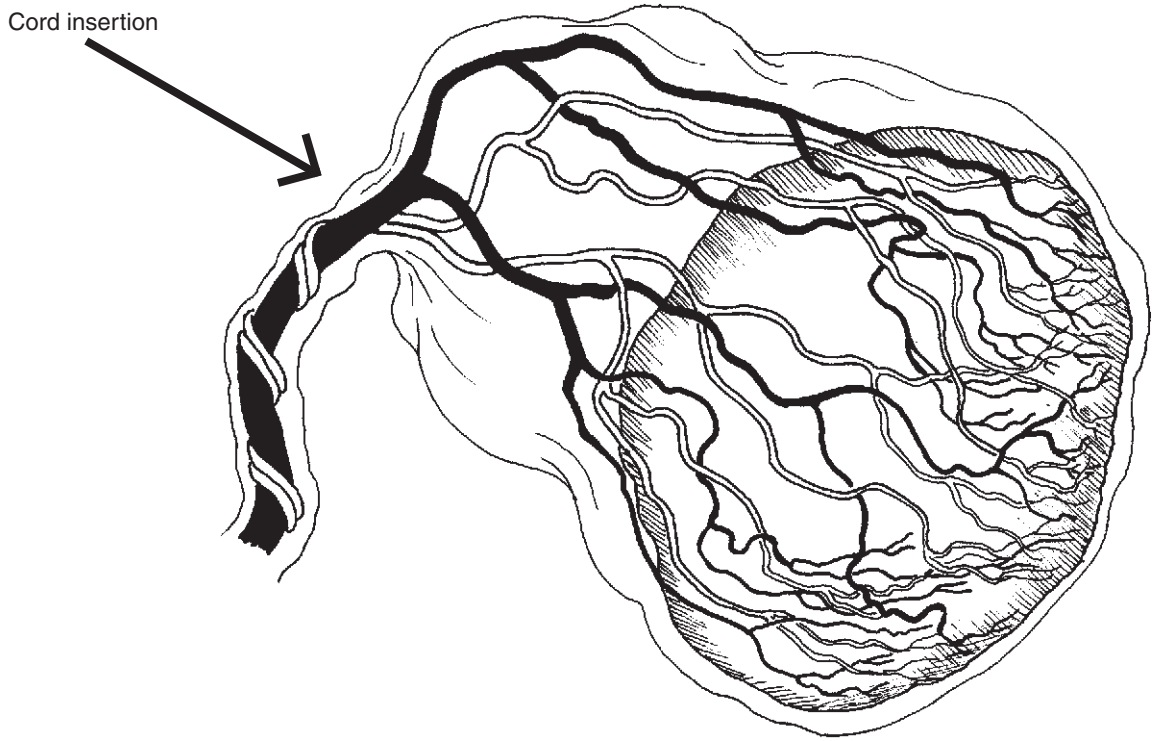


Figure 1.14 Velamentous insertion of the cord (the umbilical cord is inserted in the membranes)

Malformations of the placenta

Sometimes there is an extra lobe of placental tissue situated in the fetal sac membrane, with blood vessels running to the main placenta (placenta succenturiata) (**Figure 1.15)**. Such a lobe is more likely to be left behind in the uterus after delivery of the main placenta, and may give rise to severe bleeding. If there is a hole in the membrane with blood vessels running to it, the midwife will know that an extra lobe and not a piece of membrane has been left behind.

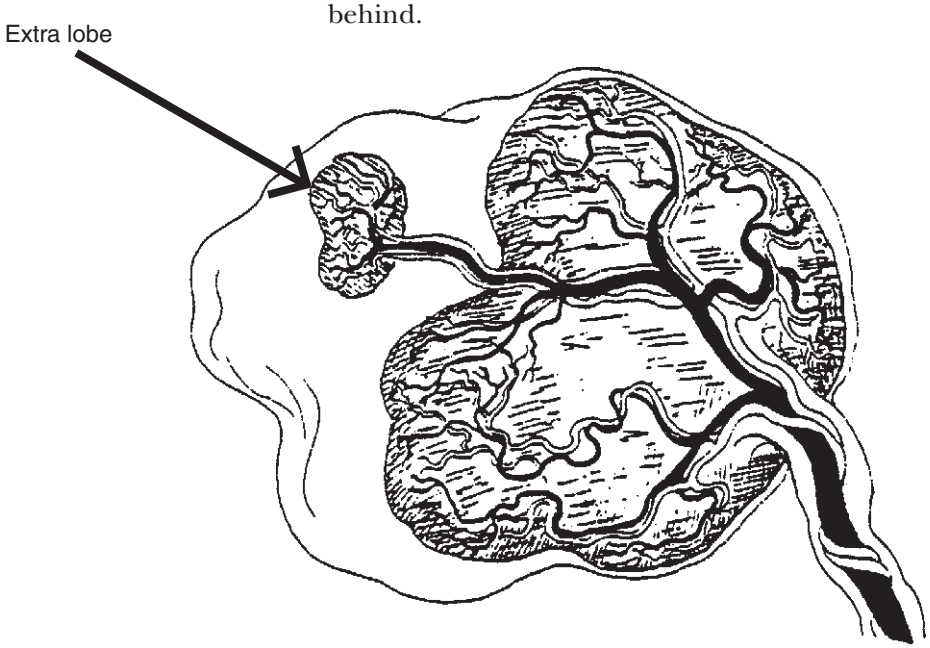


Figure 1.15 Placenta succenturiata (there is an extra lobe of placental tissue)

Sometimes there are two complete, or almost complete placental lobes (placenta bipartita) (**Figure 1.16)**. Their blood vessels unite when joining the umbilical cord.

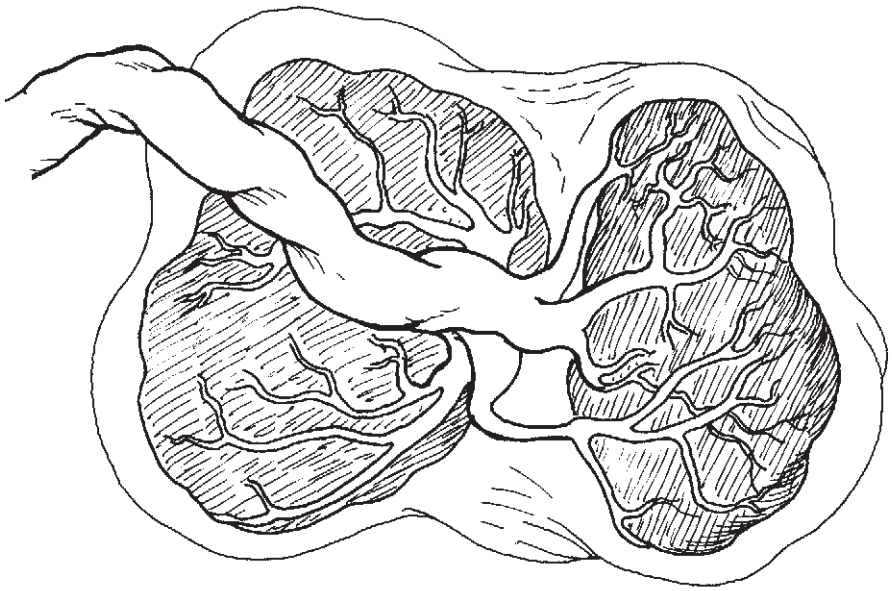


Figure 1.16 Placenta bipartita (there are two lobes of placental tissue)

Demonstration

Demonstrate the appearance of the placenta at term. Obtain one or two freshly delivered placentae to make the explanations clearer, or refer to ***Figure 1.17****. Always wear gloves when examining a placenta, and make sure you have extra gloves for the students, they do not have to be sterile.*

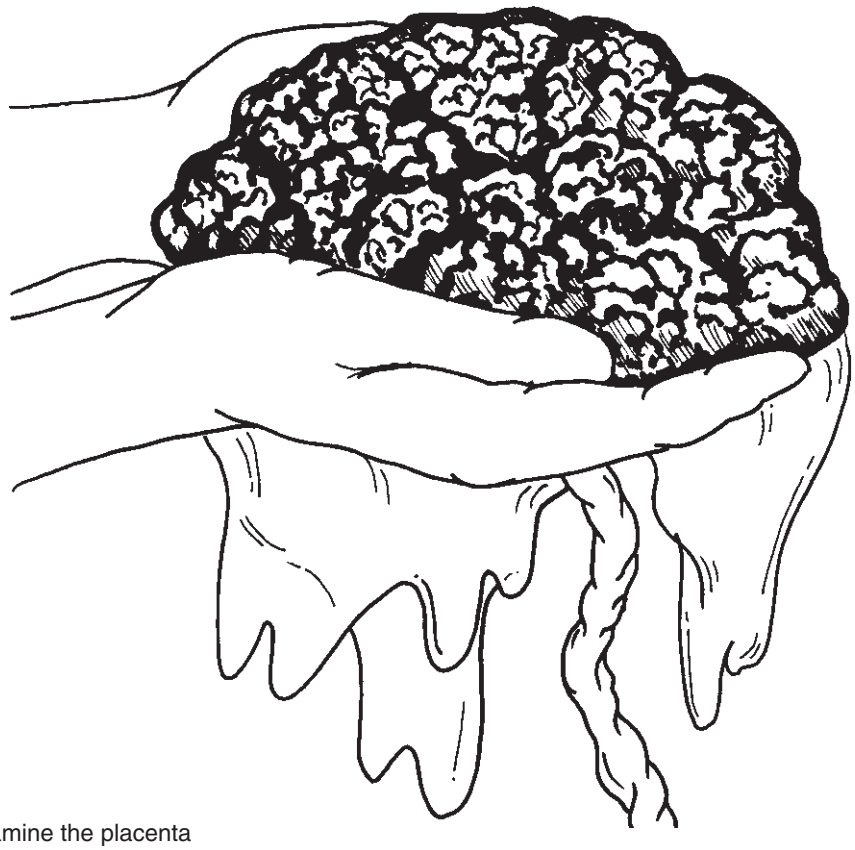


Figure 1.17 How to examine the placenta

Emphasize the following:

- *the maternal surface*
- *the fetal surface*
- *the membranes or fetal sac (show how the chorion and amnion differ and how they can be distinguished by their different textures and by the fact that it is possible to strip the amnion back as far as the insertion of the cord)*
- *the umbilical cord, its usual length and three vessels*
- *how to examine for: anatomical variations, concentrating on those of clinical significance (e.g. the danger of a retained succenturiate lobe causing PPH, the risk of the cord becoming detached if the insertion is velamentous)*
- *how to examine the placenta and membranes: hold the placenta in the palms of the hands (palms should be kept flat); all the lobules on the maternal side should be present and they should fit together. There should be no irregularities on the margins. If the maternal side is carefully rinsed with water and held to the light, a shiny layer should be seen (the decidua). If it is not intact, it*

may indicate that some fragments of placenta are left behind. On the fetal side, the membranes should appear complete. Hold the umbilical cord in one hand and let the placenta hang down: check that the membranes are complete, there should be one hole - where the baby came through (if placenta expelled by Matthews Duncan method, the membrane may be torn in more than one place). It also gives you the opportunity to look for free-ending vessels on the membranes which may indicate the presence of an extra lobe of placenta (placenta succenturiata or bipartita) which is left behind in the uterus.

A useful way to approach the clinical teaching is by question and answer. For instance, expose one surface of the placenta and ask:

- *is this the fetal or maternal surface?*
- *how do we know? (Encourage description of colour, structure, etc.)*
- *why is it important to make sure that the maternal surface is complete? (Stress risk of PPH with even very small pieces retained).*

Work through each part of the structure like this, making practical application as you do so.

Before you leave the clinical area, summarize what you have demonstrated and ask if there are any questions.

MANAGEMENT OF THE THIRD STAGE OF LABOUR

The third stage of labour is the most dangerous time, because of the risk of bleeding which can be life-threatening. Research has shown that conducting the third stage actively, as described below, reduces not only the length of the third stage, but also blood loss. It is therefore the recommended method of third stage management. In many developing countries, where women are anaemic, reduction of blood loss in the third stage is most important.

The active management of the third stage must be carried out correctly, otherwise serious complications may occur such as haemorrhage and/or inversion of the uterus.

Active management: means:

1. An oxytocic drug (such as oxytocin 10 IU IM or ergometrine 0.2 mg IM) is given after delivery of the baby and immediately after the midwife has palpated the uterus to check that there is not a multiple pregnancy.

2. The cord is clamped and cut, immediately after the drug is given.

3. When the uterus is well contracted it will feel very hard. This should occur 2–3 minutes after the administration of oxytocin. Then controlled cord traction is used (**Figure 1.18**): the lateral surface of one hand is placed firmly over the lower segment of the contracted uterus and counter traction is applied while the cord is gently pulled with the other hand until the placenta and membranes are delivered. Steady, sustained cord traction is applied following the curve of the birth canal; this means that at first traction is in a downward direction, then horizontally and finally, when the placenta is visible in the vagina, in an upward direction.

If controlled cord traction fails on the first attempt after a minute or two, the midwife should stop traction and wait for the uterus to contract again before a second attempt.

As the placenta is delivered, it should be caught in both hands at the vulva to prevent the membranes tearing and some being left behind.

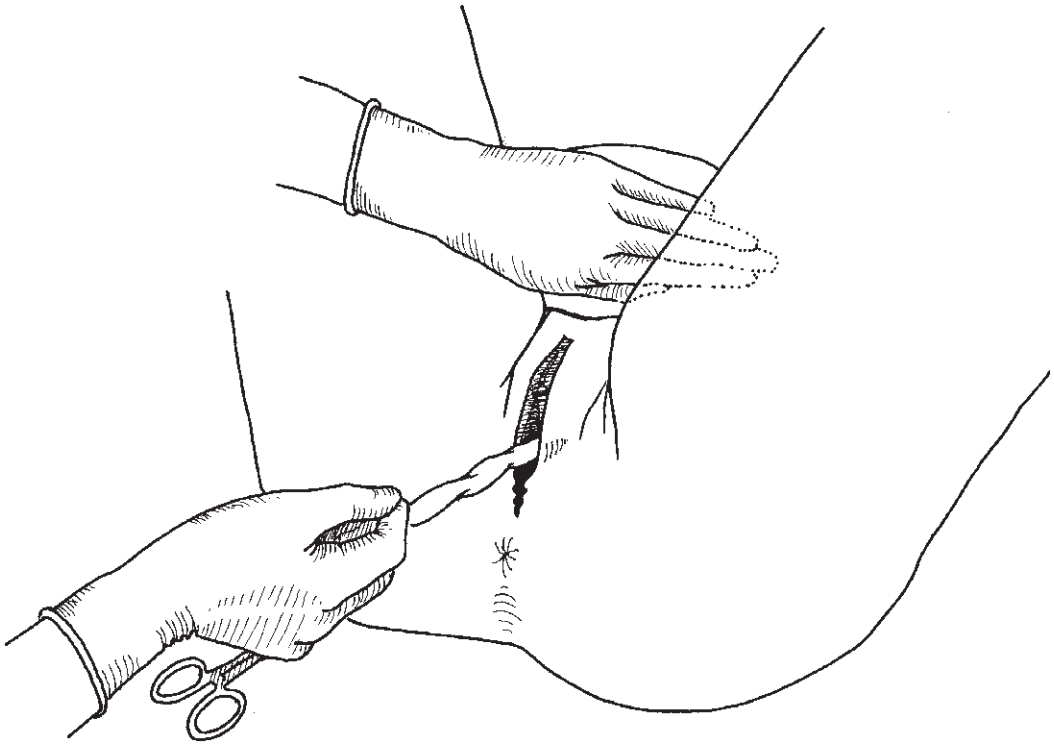


Figure 1.18 Controlled cord traction - to avoid inversion of the uterus, controlled cord traction should never be applied without counter-traction

Physiological management: (sometimes referred to as expectant management) means:

1. No oxytocics are used before delivery of the placenta.

2. Signs of placental separation are awaited.

3. Delivery of the placenta is by gravity and maternal effort.

4. The cord is clamped after delivery of the placenta (or sometimes when the pulsations have ceased), unless there is a need to clamp and cut the cord for neonatal reasons.

This method should only be used in situations when no oxytocic drugs are available.

The signs of placental separation are:

- the uterus becomes very hard, round, mobile and rises in the abdomen
- the cord lengthens
- there is a little vaginal blood loss.

Once these signs are visible, check that the uterus is well contracted and, if it is, ask the woman to bear down to push the placenta out. Catch the placenta in both hands as it emerges from the vagina. If the placenta fails to deliver, check that the bladder is empty and, if not, ask the woman to pass urine, then try again to deliver the placenta with the next uterine contraction.

To teach the management of the third stage, take the students to a labour ward.

Teach and/or supervise each student in clinical practice. If there is a large number of students and you are the only teacher, ask some experienced midwives to help with teaching and supervizing in clinical practice.

To prepare for this, make sure you are familiar with the details of the checklists at the end of this session. They list the sub-tasks that should be performed for active management of the third stage of labour, then for physiological management. The knowledge, skills and attitudes needed to accomplish those sub-tasks are also listed. Going over these checklists with practicing midwives who will assist in clinical teaching and supervision of students before the session can be very helpful.

When teaching your students in the clinical area, make sure they understand:

- *how each action is done. (Are there any special points to note about the technique?)*

- *the reason for doing each sub-task (e.g. making sure that the bladder is empty will help ensure that the uterus is not prevented from contracting)*
- *what can go wrong if a sub-task is poorly done (e.g. if the membranes are pulled out quickly they may tear and be left behind in the uterus, thus increasing the risk of bleeding and infection).*

Choice of oxytocic drugs

Oxytocics cause the uterus to contract. They speed up the delivery of the placenta and lessen the blood loss. The choices are:

A. Oxytocin.
B. Syntometrine.
C. Ergometrine.

A. Oxytocin

Oxytocin is a pituitary (posterior lobe) extract which can be prepared synthetically:

- causes contraction of smooth muscle and therefore has a powerful action on the uterine muscle
- acts within 2½ minutes when given intramuscularly.

Advantages of oxytocin:
It has a rapid action and does not cause side effects in most cases. It is also more stable in hot climates.

Disadvantages of oxytocin:
It does not have a sustained action.

B. Syntometrine

Syntometrine is a combined preparation, ergometrine and oxytocin which is given by intramuscular injection.

Advantages of syntometrine:
It has the combined effect of the rapid action of oxytocin and the sustained action of ergometrine.

Disadvantages of syntometrine:
There is a greater risk of producing temporary hypertension and vomiting.

C. Ergometrine

Ergometrine is a preparation of ergot which:

- may be given orally, intramuscularly or intravenously. However, oral preparation has been found to be **ineffective for active management** of the third stage - and should **not** be used for this purpose
- takes 6–7 minutes to take effect when given intramuscularly, and 45 seconds when given intravenously
- causes marked spasm of the uterus by a series of rapid contractions
- has an effect lasting approximately 2–4 hours.

Advantages of ergometrine:
It is the cheapest of the oxytocic drugs and it has a sustained action.

Disadvantages of ergometrine:
Headache, nausea and vomiting, and hypertension.

Ergometrine is therefore definitely contraindicated and should **never** be given to women with raised blood pressure and/or cardiac disease.

Ergometrine stored at room temperature or exposed to light, may lose a lot of its potency.

Recommendations for practice

1. The use of oxytocin is recommended. Where this is not available, syntometrine or ergometrine should be used.

2. Preparations containing ergometrine should not be used for women with raised blood pressure or cardiac disease.

3. It is recommended that oxytocics should be stored in a refrigerator at 2–8°C and away from light.

Timing of administration of oxytocic drugs

The choices:

A. With the crowning of the head.
B. With the birth of the anterior shoulder.
C. After the delivery of the baby when it is confirmed that there is not a second twin.

There is not a great deal of research available on this subject. However, because of the danger of intrauterine asphyxia of an undiagnosed second twin, it makes sense to wait until delivery of the baby and confirmation that there is not a second twin before giving an oxytocic drug.

Recommendations for practice

1. Give oxytocic drugs after delivery of the baby, when it has been confirmed by abdominal palpation that there is no second twin.

2. Allow time for the oxytocic drug to act and ensure that the uterus is well contracted before applying controlled cord traction.

Nipple stimulation

Suckling of the baby at the breast stimulates the natural production of oxytocin. Oxytocin helps the uterus to contract. Contraction of the uterus is essential in order to control bleeding after delivery. However putting the baby to the breast immediately after the birth has not been shown to reduce the incidence of PPH, but early suckling has other benefits: it is associated with successful breastfeeding for a longer period of time.

Manual nipple stimulation may also stimulate the production of oxytocin and help the uterus to contract.

Recommendation for practice

There is no proven effective alternative to the prophylactic administration of an oxytocic drug given as part of the routine management of the third stage of labour. However, when no oxytocics are available, nipple stimulation either by suckling or manually should be tried.

Put the baby to the breast immediately after birth to facilitate successful breastfeeding.

Estimating blood loss

Making an accurate estimate of blood loss is not easy. The true amount may be hidden due to absorption by towels, pads or sheets, spilling on the floor and mixing with amniotic fluid.

Research indicates that in most cases the blood loss is usually underestimated.

Blood loss up to 300 ml is more likely to be estimated fairly accurately, but the larger the loss, the greater the likelihood of underestimation.

Underestimation of blood loss can be a serious error. It means that:

- the seriousness of a large PPH may not be recognized and therefore may be managed inadequately
- blood and fluid replacement will be insufficient.

These errors can lead to maternal death or morbidity which includes anaemia and greater risk of infection.

Recommendation for practice

Frequent practice of measuring fluids can help midwives to become more skilled in assessing blood loss more accurately. If blood loss exceeding 500 ml is doubled, this is likely to be a more accurate estimation.

SUMMARY AND CONCLUSION

Consider the available research evidence on methods of practice. Discuss the risks/dangers for each method. Identify any relevant traditional practices or expectations which could influence decisions about practice (e.g. use of traditional medicines, traditions or taboos relating to early suckling).

Agree on the best approach to practice.

Ask if there are any questions.

Summarize the whole of this session.

Quiz on applied anatomy and physiology of the third stage of labour

Use this quiz to assess students' understanding and knowledge of the third stage of labour.

The questions are in italic. The answers are in normal text. Answers to questions on anatomy are fairly straightforward and usually a student's answer will be clearly right or wrong. Questions about physiology call for understanding rather than just remembering a name or a fact. Make sure that students' answers reflect their understanding. This means that answers will not necessarily be given as written here. Award a point wherever possible for understanding and/or explanation rather than just for learning the answer by heart.

Anatomy of the uterus

Q1 *Name the structures which lie in front of and behind the uterus?*

A In front (or anteriorly) are the bladder and utero-vesical pouch.

Behind (or posteriorly) are the rectum and Pouch of Douglas.

Q2 *The non-pregnant uterus is described as having two main parts. What are these?*

A The body (or corpus) and the neck (or cervix).

Q3 *Name the three layers of the uterus.*

A The endometrium, myometrium and perimetrium.

Q4 *Which fibres of the myometrium are important in controlling bleeding in the third stage of labour?*

A The oblique fibres which form the middle layer (also known as "criss-cross").

Q5 *Where is the fundus?*

A It is the upper part of the uterus between the insertion of the two fallopian tubes.

Q6 *Where is the isthmus?*

A This is the narrow area between the cavity of the body of the uterus and the cervix.

Q7 *What is the internal os?*

A The narrow opening between the isthmus and the cervix.

Q8 *What is the external os?*

A The opening at the lower end of the cervix into the vagina. It is small and round before pregnancy and becomes a transverse slit after pregnancy.

Q9 *Describe the difference between the non-pregnant and the pregnant cervix.*

A The non-pregnant cervix is firm and pink, the pregnant cervix is soft and purple. During pregnancy, the cervical canal contains a plug of mucus which helps protect against infection.

Q10 *What causes these changes to take place in the cervix?*

A These changes are caused by increased vascularity and the influence of hormones.

Q11 *During pregnancy the uterus is described in two functional areas, either above or below the isthmus. What are they called?*

A The upper and lower uterine segments.

Q12 *How do these two segments function differently during the first stage of labour?*

A The upper segment contracts and becomes thicker. The lower segment distends and becomes thinner.

Q13 *In which of these two segments of the uterus are the oblique fibres of the myometrium mostly situated?*

A In the upper segment.

Q14 *Does the placenta normally embed into the myometrium?*

A No. The placenta does not normally embed beyond the decidua.

Q15 *What would happen if the placenta did embed in the myometrium?*

A The placenta would be retained as it would not separate from the decidua in the normal way.

Q16 *Do fetal and maternal blood mix in the placenta?*

A No. Fetal and maternal blood are normally separated by the cells of the chorionic villi in the placenta.

Third stage physiology

Q17 *How does the size of the placental site alter during the third stage of labour?*

A It becomes smaller due to the contraction and retraction of the uterine muscle.

Q18 *What happens to the placenta as the placental site becomes smaller and why?*

A The placenta begins to separate from the uterine wall because unlike the uterus it is not elastic and cannot contract and retract.

Q19 *How does the retroplacental clot further help separation?*

A It blood collects in the chorio-decidual space and helps to shear off the placenta from the decidua.

Q20 *What are the signs that placental separation and descent have taken place?*

A Lengthening of the cord, a trickle of blood and contraction of the uterus with the fundus rising abdominally.

Q21 *Describe the "Schultze method" of placental separation.*

A The placenta detaches from a central point and a retroplacental clot is formed which is usually enclosed in the membranes when the placenta is delivered.

Q22 *What may be the hazard of the "Matthews Duncan method" of placental separation?*

A It may be associated with a placenta lying lower in the uterus. The process of separation takes longer, membranes may be ragged and blood loss is greater if the placenta is low-lying (because there are fewer oblique fibres in the lower segment).

Q23 *What is the normal blood flow through the placental site? (or how much blood flows through the placental site each minute?)*

A 500–800 ml per minute.

It would be useful here to remind students that, if bleeding is not controlled promptly, this is how quickly a woman will lose blood).

Q24 *Describe how blood loss is controlled after delivery of the placenta.*

A Following delivery of the placenta the oblique muscle fibres of the myometrium contract very strongly to compress the blood vessels in the uterus. Clots form in the torn blood vessels.

Q25 *What happens if blood clots are left behind in the cavity of the uterus after delivery of the placenta?*

A They will prevent strong contraction of the uterus and cause postpartum haemorrhage.

Q26 *Name two factors which can interfere with bleeding control.*

A Retained placenta or membranes, or parts of these. A full bladder.

(Other factors which may be mentioned here are factors which will interfere with uterine contraction e.g. prolonged labour, anaesthesia and analgesia. Accept any correct answers).

Q27 *Why is aseptic technique so important during the third stage of labour?*

A Because the placental site contains large venous sinuses with direct access into the general circulation. Thus infection, as a result of microorganisms being introduced into the uterus because of poor hygiene, can rapidly lead to septicaemia. The placental site is also warm and dark, making it an ideal place to culture microorganisms.

CHECKLIST OF SUB-TASKS FOR THE MANAGEMENT OF THE THIRD STAGE OF LABOUR

Use these checklists in teaching students and assessing their performance in the clinical area.

Checklist A gives the sub-tasks that should be performed for active management of the third stage of labour. Checklist B, for physiological management. The knowledge, skills and attitudes needed to accomplish those sub-tasks are also listed.

CHECKLIST A ✓

Task: Active management of the third stage of labour

(A) = Actions
(D) = Decisions
(C) = Communications

Sub-tasks	Knowledge	Skill	Attitudes
1. Identify any high risk, e.g. anaemia, high parity (D)	Factors that increase risk of PPH	History taking and review. Recognition of clinical signs	Accuracy Thoroughness
2. Explain to woman (C)	Basic third stage physiology and management	Ability to explain clearly why and how, using language the woman can understand	Friendliness Clarity
3. Obtain consent of woman (A)	Legal issues Policies for practice	Ability to explain why	Accuracy
4. Administer oxytocic drug after delivery of baby and after a second twin has been excluded (A)	Action, dose, use of oxytocics storage and precautions Sites for IMI and IVI, and indications for IV administration	Maintaining refrigeration of drugs IMI and IVI techniques	Carefulness Accuracy Gentleness
5. Cut and clamp cord (A)	Timing of cord clamping	Cord cutting technique	Speed Accuracy
6. Position the woman (A)	Physiology Woman's preference	Assisting woman to adopt optimum position	Carefulness Gentleness
7. Use aseptic technique (A)	Dangers of infection	Use of strict asepsis	Thoroughness
8. Ensure bladder is empty (A)	Relative anatomy third stage physiology	Care of bladder throughout labour	Thoroughness
9. Allow time for oxytocic drug to act (D)	Action of oxytocic drugs	Timing of administration and CCT	Patience Carefulness Accuracy
10. Ensure uterus well contracted (A)	Action of oxytocic drug Consistency of contracted uterus	Palpation of uterus	Accuracy Gentleness

Sub-tasks	Knowledge	Skill	Attitudes
11. Apply counter-traction with left hand (A)	Physiology of third stage	Handling uterus and placenta	Carefulness Gentleness
12. Apply controlled cord traction with right hand (A)	Physiology of third stage	Handling uterus and placenta	Carefulness Gentleness
13. Receive placenta in cupped hands when visible (A)	Recognize danger of retained membranes, if placenta delivered too quickly and torn	Handling placenta	Carefulness Gentleness
14. Gentle up and down movement to deliver membranes (A)	Recognize friability of membranes	Handling placenta and membranes	Carefulness Gentleness
15. Ensure uterus remains well contracted (D)	Consistency of uterus, contracted or relaxed	Palpation of uterus and massage if not well contracted	Accuracy Gentleness
16. Ensure loss not excessive (D)	Normal blood loss	Observation and measure	Thoroughness
17. Examine for any trauma (A)	Normal structure of external genitalia	Careful examination	Thoroughness Gentleness
18. Examine placenta and membranes (A)	Gross anatomy of placenta and membranes Problems of retained products	Observation and detailed examination	Thoroughness Accuracy
19. Measure blood loss (A)	Normal blood loss Definition of PPH	Observation and measure	Accuracy
20. Identify need to refer any abnormality (D)	Assessment of trauma and/or deterioration in condition	Recognition of need for and ability to organize referral	Accuracy Speed
21. Report to doctor (A*)		Professional Communication	Accuracy Speed
22 Take initial steps to resuscitate and maintain stable condition (A)*	Normal vital signs and signs of deterioration	Ability to set up IVI and monitor condition	Accuracy Speed
23. Record details (A)	Importance of record keeping	Written communication	Thoroughness Accuracy
24. Evaluate care given (D)	Relationship between process and outcome	Reflective practice	Thoroughness Objectivity

* Only necessary when complications arise.

CHECKLIST B ✓

Task: Physiological management of the third stage of labour

(A) = Actions
(D) = Decisions
(C) = Communications

Sub-tasks	Knowledge	Skills	Attitudes
1. Identify any high risk, e.g. anaemia, high parity (D)	Factors that increase risk of PPH	History taking and review Recognition of clinical signs	Accuracy Thoroughness
2. Explain to woman (C)	Basic third stage physiology and management	Ability to explain clearly why and how, using language the woman can understand	Friendliness Clarity
3. Position the woman (A)	Physiology Woman's preference	Assisting woman to adopt optimum position	Carefulness Gentleness
4. Use aseptic technique (A)	Dangers of infection	Use of strict asepsis	Thoroughness
5. Ensure bladder is empty (A)	Relative anatomy third stage physiology	Care of bladder throughout labour Catheterization if unable to empty full bladder	Thoroughness
6. Watch for signs of placental separation and descent (D)	Third stage physiology	Observation	Patience Carefulness Accuracy
7. Ensure uterus well contracted (A)	Consistency of contracted uterus	Palpation of uterus and massage to promote contraction	Accuracy Gentleness
8. Encourage mother to push (C)	Physiology of third stage	Observation	Patience Encouragement
9. Monitor general condition: Pulse Blood pressure (A) (D)	 Normal pulse rate, rhythm and volume Normal blood pressure	 Observation Palpation of pulse and interpretation Use of sphygmomanometer	 Thoroughness Accuracy Accuracy
10. Receive placenta in both cupped hands when visible (A)	Dangers of torn membranes, part of which may be retained	Handling placenta	Carefulness Gentleness
11. Gentle up and down movement to deliver membranes (A)	Recognize friability of membranes	Handling placenta and membranes	Carefulness Gentleness
12. Ensure uterus remains well contracted (D)	Consistency of uterus, contracted or relaxed	Palpation of uterus and massage to promote contraction	Accuracy Gentleness
13. Ensure loss not excessive (D)	Normal blood loss	Observation and be prepared to take appropiate action if bleeding increases	Thoroughness
14. Examine for any trauma (A)	Normal structure of external genitalia	Detailed examination	Thoroughness Gentleness

Sub-tasks	Knowledge	Skills	Attitudes
15. Examine placenta and membranes (A)	Gross anatomy of placenta and membranes Problems of retained products	Observation Accuracy	Thoroughness
16. Clamp and cut cord (A)	Timing of cord clamping	Cord cutting technique	Speed Accuracy
17. Measure blood loss (A)	Normal blood loss Definition of PPH	Observation and measure	Accuracy
18. Identify need to refer any abnormality including delay in delivery of placenta (D)	Assessment of trauma and/or deterioration in condition Length of third stage	Recognition of need for and ability to organize referral	Accuracy Speed
19. Report to doctor (A)*		Professional communication	Accuracy Speed
20 Take initial steps to resuscitate and maintain stable condition (A)*	Normal vital signs and signs of deterioration	Ability to set up IVI and monitor condition	Accuracy Speed
21. Record details (A)	Importance of record keeping	Written communication	Thoroughness Accuracy
22. Evaluate care given (D)	Relationship between process and outcome	Reflective practice	Thoroughness Objectivity

* Only necessary when complications arise.

2 UNDERSTANDING POSTPARTUM HAEMORRHAGE

SESSION 2
UNDERSTANDING POSTPARTUM HAEMORRHAGE

Aims

- To enable students to understand the importance of prompt and appropriate management in saving lives from postpartum haemorrhage (PPH).
- To enable students to understand the definitions and descriptions used in relation to postpartum haemorrhage.

Objectives

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

- Define postpartum haemorrhage (PPH), primary PPH, secondary PPH and retained placenta.
- Define atonic bleeding and traumatic bleeding.
- List the causes of primary PPH and identify those which are associated with a high incidence of maternal death.
- List the causes of secondary PPH and identify those which are associated with a high incidence of maternal death.
- Explain the effects of severe blood loss on the body and how this can endanger life and health.

Plan

Group work.
Discussion.
Modified lecture.
Demonstration.
Total time: 2 hours.

Resources

Equipment for demonstration.

INTRODUCTION

Ask the students to form groups in order to define postpartum haemorrhage (PPH), primary PPH, secondary PPH, retained placenta, atonic bleeding and traumatic bleeding. Each group should in turn report back, giving one of their definitions, and the other groups should comment if they agree or if they had a different definition. Students should understand the following definitions.

DEFINITIONS

Postpartum haemorrhage: (PPH)

is a loss of 500 ml or more from the genital tract after delivery.

Note: It is important to remember that a lower level of blood loss can cause the woman's condition to deteriorate in certain circumstances. This will include the presence of anaemia or other medical conditions e.g. cardiac disease.

Primary postpartum haemorrhage is excessive bleeding occurring within 24 hours of delivery.

Secondary postpartum haemorrhage includes excessive bleeding occurring between 24 hours after delivery of the baby and 6 weeks postpartum.

Retained placenta:

describes the situation when the placenta has not been delivered within 30 minutes after the birth of the baby.

Atonic 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, remnants of placental tissue, membranes and blood clot will predispose to atonic bleeding.

Traumatic bleeding:

occurs as a result of injury to the genital tract.

CAUSES OF PRIMARY PPH

These include:

- Atonic uterus (due for example to retained placenta or membranes)
- Genital trauma (includes both spontaneous and that caused by management or interference, e.g. instrumental delivery including caesarean section, episiotomy, "gishiri" cut)

- Coagulopathy/clotting failure (rare)*
- Inversion of the uterus (rare)*.

We shall examine in next session, the factors which cause or make primary PPH more likely to occur.

CAUSES OF SECONDARY PPH

- Retained fragments of placenta or membranes
- Shedding of dead tissue following obstructed labour (this may involve cervix, vagina, bladder, rectum)
- Breakdown of uterine wound (after caesarean section or ruptured uterus.

EFFECTS OF SEVERE BLOOD LOSS ON THE BODY

Help students to understand that a woman can bleed to death very quickly from postpartum haemorrhage.

Ask: *How much blood can a woman lose in one minute due to PPH?*

Answer: Up to 500 ml per minute.

Ask: *How many litres of blood does the average woman have in her circulation?*

Answer: 5 litres.

Ask: *How long would it take for a woman to become exsanguinated - or to lose all her blood?*

Answer: 10 minutes.

It is therefore easy to understand that the midwife must act quickly and efficiently in order to save life in cases of PPH.

Ask: *Which vital organs will stop functioning if the woman is severely shocked.*

Answer: The kidneys.

Ask: *Why is this a risk in PPH?*

* Associated with high incidence of death.

Answer: Because severe blood loss causes hypovolaemia (i.e. a reduction in the volume of circulating blood). This will lead to necrosis or death, first of the renal tubules and then of the renal cortex. Cortical necrosis is not reversible and will cause the woman to die.

Ask students to think about the effects of PPH on women who are not in good health (e.g. women who are anaemic: they will have less red blood cells to carry oxygen and will collapse sooner even with little blood loss). Others may be weakened due to chronic ill-health. These illnesses are often also associated with anaemia (e.g. HIV/AIDS, malaria, hookworm, haemoglobinopathies, tuberculosis, dysentery).

Emphasize the fact that even if a woman does not die as a result of the PPH, her health can be adversely affected.

Ask the students to form groups and consider what effects this can cause.

Anaemia will make the woman tired and less able to:

- look after herself
- lactate and feed her baby
- look after her family.

This will affect the health and safety of the whole family. It will make her prone to infection. It will make her prone to other illnesses.

In a future pregnancy she may suffer:

- spontaneous abortion
- intrauterine hypoxia
- intrauterine growth retardation
- PPH from which she may die.

A long-term result of severe PPH and shock can be Sheehan's syndrome. This is caused by hypovolaemia which causes necrosis of the pituitary gland. This affects endocrine function and there will be failure of lactation and premature ageing.

Make sure that the students understand:

- *the importance of managing PPH*
- *that prompt and correct management can save lives*
- *the meaning of all definitions in this session.*

DEMONSTRATION*

Midwifery personnel need to be able to tell the difference between normal bleeding after childbirth and dangerous blood loss. Blood loss is usually underestimated (see "Estimating blood loss" in Session 1).

*It helps if students actually see the quantity of blood that is dangerous to lose (**Figure 2.1**). Put 500 ml of red-coloured water in a bottle and show it to the students. To make it thick in order to look like blood, mix some red gelatin powder into the water, or use tomato juice, or blood from a freshly killed animal (add sodium oxalate to delay clotting). Spill the liquid over cloths or rags. Another bottle containing 150 ml of the liquid (average blood loss during a normal third stage) can be spilled over other rags for comparison.*

Ask the students to estimate the blood loss. This exercise should help them to realize how inaccurate the estimation of blood loss can be.

Ask if there are any questions.

Summarize.

* Adapted from Werner D, Bower B. *Helping health workers learn*. 1st ed. The Hesperian Foundation, Berkeley, CA, 1982.

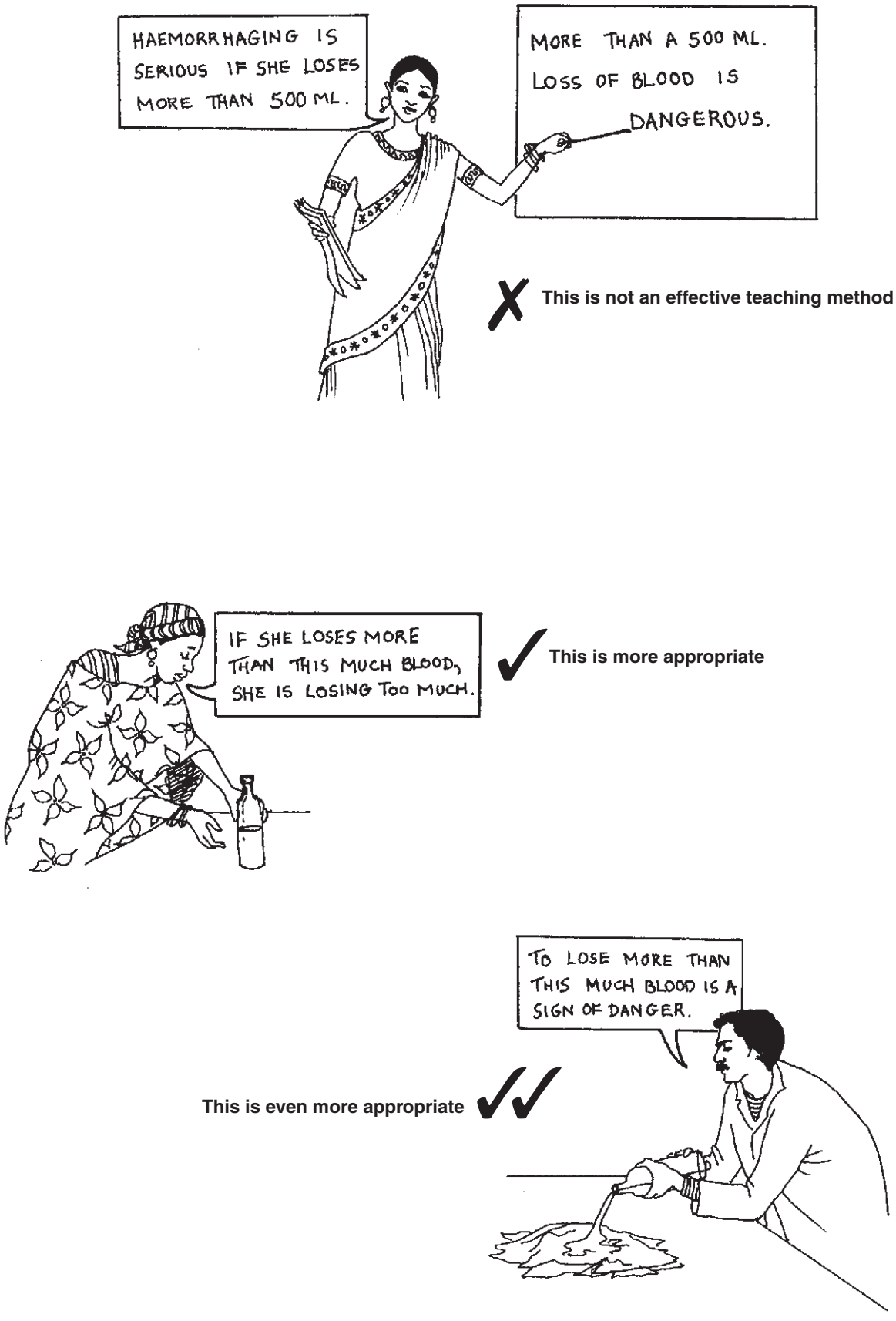


Figure 2.1 Teaching about estimation of blood loss

3 AVOIDABLE FACTORS

SESSION 3
AVOIDABLE FACTORS

Aims

To enable students to recognize the factors which contribute to maternal death due to postpartum haemorrhage, and to understand that most of these deaths are preventable.

Objectives

On completion of Session 3, 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, postpartum haemorrhage 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.
Worksheets.

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, you should 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 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 and which was 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:

- *anaemia contributes to death due to postpartum haemorrhage, since a much smaller blood loss can be fatal for anaemic women (anaemia should have been corrected antenatally).*

In order to prevent maternal death, it is necessary to look not only at the causes of death, but at the risk factors:

- *postpartum haemorrhage can be a cause of death, anaemia is a risk factor (it contributes to the risk and makes the danger greater).*

GROUP WORK

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

They should concentrate on the two main causes of PPH: atonic uterus and genital trauma, and then list causes or risk factors for these two types of PPH.

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.

In the case of PPH due to atonic uterus, organize the factors mentioned by the students under the following headings:

- *interference with ability of uterus to contract*
- *overstretched uterus*
- *tired uterus*
- *wrong practice*
- *medical factors*
- *obstetric factors not listed above.*

You should then have a list on the blackboard such as the one in the checklist at the end of this session. Use this checklist as a guide to the factors that should be mentioned.

In the case of PPH due to genital trauma, identify the different sites where trauma can occur and discuss the causes or risk factors for genital trauma (see checklist at the end of this session).

Then list the community and health service risk factors that make dying from PPH more likely (see checklist). Discuss in particular traditional beliefs regarding blood loss in the third stage of labour. In many countries, traditional birth attendants and the family look upon bleeding after delivery as normal, and a good thing, and some would encourage the flow of "bad blood" in the post-natal period by giving medicines. If a woman had a PPH, family members would therefore not be aware of the seriousness of the condition until it was too late.

Stress the importance of access to health facilities and transportation in preventing deaths from PPH. Death from PPH can happen much faster than death from some other major complications. As was noted in Session 1, PPH is often the most common cause of maternal death, and a large proportion of women in developing countries live in rural areas and deliver at home. Therefore, unless there is easy access to skilled health workers and, where necessary to suitable health facilities, many women with PPH will die.

Make sure the students know why each factor causes or makes PPH more likely or more dangerous. Discuss in particular mismanagement of the third stage, and harmful traditional practices, since these are the most important controllable causes of PPH. An example of mismanagement is allowing the woman to enter the third stage of labour with a full bladder. This adversely affects uterine action and, as a result, PPH is more likely to occur. Constant massaging and squeezing of the uterus while the placenta is still undelivered can cause partial separation of the placenta and is another example of mismanagement.

Finally, help the students to be aware that in many cases PPH is preventable and it is essential to address avoidable factors, so that lives can be saved. Identify the avoidable factors and discuss the "steps to avoid occurrence" which the groups suggested in their feedback.

These should involve prevention of avoidable factors during:

- *pregnancy*
- *labour (1st stage management, 2nd stage management, 3rd stage management)*
- *immediate postnatal care (the first 2 hours after delivery of the placenta).*

Help the students see that community risk factors for PPH can be influenced by community education, and therefore the midwife has an important role in this. She should educate community members about the danger of PPH, risk factors, and the importance of prenatal care. The midwife could also get involved in setting up emergency plans in particular for transportation to a facility if needed, with village TBA/auxiliaries so that they are able to make effective referrals for cases of PPH.

Ask if there are any questions.

Summarize, emphasizing the importance of prevention.

CHECKLIST FOR POSTPARTUM HAEMORRHAGE ✓

Use this checklist as a guide to the factors that should be mentioned during the discussion.

* avoidable factors.
‡ high risk, should be identified antenatally and referred in good time.
\+ ensure mismanagement not involved!

1. Atonic uterus

Risk factors

Interference with ability of uterus to contract
Retained placenta +
Retained placental tissue or membrane +
Incomplete separation of placenta +
Full bladder +*
Antepartum haemorrhage ‡

- Placenta praevia (less oblique muscle fibres in the lower uterine segment), or
- Placental abruption (muscle fibres are damaged due to concealed uterine haemorrhage).

Overstretched uterus
High parity (uterus loses elasticity) *‡
Multiple pregnancy ‡
Polyhydramnios ‡
Large baby ‡
Fibroids * (health check between pregnancies, management when diagnosed and family planning in older women).

Tired uterus
Prolonged labour * (avoid by correct use of the partograph and timely referral for assessment and, if no contraindication, augmentation of labour, or operative delivery, if indicated).

Wrong practice
Harmful traditional practices *
Harmful traditional medicines *
Mismanagement of third stage labour *+

Medical factors
Anaemia *
Coagulopathy ‡

Obstetric factors not listed above
Previous third stage complication ‡ (previous retained placenta, previous PPH)
Intrauterine death with fetus retained in utero for 3–4 weeks or more ‡
Severe pre-eclampsia and eclampsia ‡
Induced or augmented labour +

Precipitate labour
Caesarean section +
Chorioamnionitis or endometritis (potentially avoidable)
Tocolytic drugs which may have been used to try and prevent preterm labour
General anaesthesia.+

2. Genital trauma

Sites of trauma

- perineum* (trauma is preventable through skilled delivery and correct timing and use of episiotomy where necessary, but remember that routine episiotomy is not necessary and should be avoided. Episiotomy can also cause haemorrhage)
- vaginal walls + (can be caused by unskilled use of forceps)
- cervix + (can be caused by the woman pushing before full dilatation, improper use of forceps. If associated with ruptured uterus - this should be avoidable)*
- uterus* (avoidance of prolonged and obstructed labour).

Risk factors

- mistimed episiotomy +
- induced labour +
- precipitate labour +
- caesarean section +
- forceps delivery +
- prolonged/obstructed labour +
- previous surgery to the uterus +
- previous history of prolonged/obstructed labour
- anaemia.*

3. Community risk factors

- traditional beliefs about the third stage of labour *
- lack of awareness about the seriousness of excessive bleeding *
- great distance from a woman's home to a health facility
- transport problems
- low socioeconomic status
- ignorance *
- lack of trust in formal health services (potentially avoidable).

4. Health service risk factors

(also discussed in Session 7)

- delays in manual removal of placenta in cases of retained placenta *
- delays in starting appropriate resuscitative measures due to a variety of factors, including lack of resources *
- faulty technique at caesarean section or during operative vaginal deliveries *
- underestimation of blood loss and delay in calling for help or in referring the woman *

- unavailability of oxytocic drugs *
- insufficient well-trained staff *
- lack of effective protocols *
- restrictive barriers to midwives, and other non-medical staff, carrying out emergency life-saving procedures.*

INSTRUCTIONS FOR GROUP WORK

(Please read all the instructions carefully before you begin)

1. Define postpartum haemorrhage.
2. Name the two most common causes of the condition.
3. List the risk factors for atonic PPH and for traumatic PPH.
4. Explain why each factor makes PPH more likely or more dangerous.
5. Mark those risk factors which are avoidable (or can be prevented).
6. Outline the steps which must be taken to prevent these avoidable factors.

You are given some examples below. Using the following Worksheets, work through them in the same way.

You have one hour in your group.

Appoint a group leader and a person to report back.

Examples:

Preventing postpartum haemorrhage due to atonic uterus

Risk factors for atonic uterus	Why does this factor make PPH more likely or more dangerous	Avoidable?	Steps to avoid occurrence
Anaemia	A much smaller blood loss can be fatal	Yes	Dietary advice and iron/folate supplementation during pregnancy. Treatment of conditions leading to anaemia, e.g. infestation, malaria, etc.

Preventing postpartum haemorrhage due to trauma

Site of trauma	Risk factors for genital trauma	Why	Avoidable?	Steps to avoid occurrence
Uterus	Obstructed labour	Lower segment of uterus becomes increasingly stretched and liable to rupture	Yes	Use partograph Operative delivery if partograph abnormal (referral may be needed)

WORKSHEET 1

PREVENTING POSTPARTUM HAEMORRHAGE DUE TO ATONIC UTERUS			
Risk factors for atonic uterus	Why does the factor make PPH more likely or more dangerous	Avoidable?	Steps to avoid occurrence

WORKSHEET 2 

PREVENTING POSTPARTUM HAEMORRHAGE DUE TO TRAUMA				
Site of trauma	Risk factors for genital trauma	Why?	Avoidable?	Steps to avoid occurrence

4 IDENTIFYING THE PROBLEM

SESSION 4
IDENTIFYING THE PROBLEM

Aims

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

Objectives

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

- List the steps involved in providing effective management.
- Describe how a diagnosis and a differential diagnosis are made in relation to primary and secondary postpartum haemorrhage.
- Describe the signs of shock.

Plan

Modified lecture, discussion (2 hours).

Resources

Chart 1: Primary postpartum haemorrhage: identifying the problem.

INTRODUCTION

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

1. *Identify the problem.*

2. *Decide on the aim of the 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 symptoms and signs noted).

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

Ask students to form discussion groups to decide how this is done.

Suitable questions to ask could be:

- *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 senses (sight, hearing, smell, touch)*
- *asks questions*
- *takes all circumstances into account.*

Relate this to discussion on 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 of their senses and powers of observation to:

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

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

In identifying the problem - postpartum haemorrhage - we first have to decide (diagnose) if it is primary or secondary PPH.

The essential question to ask is "When did the haemorrhage occur?"

Ask students to recall the definitions of primary and secondary PPH. The kind of PPH depends on whether the haemorrhage occurred:

- *within 24 hours of delivery - primary PPH*
- *after 24 hours, and within 6 weeks of delivery - secondary PPH.*

DIAGNOSIS AND DIFFERENTIAL DIAGNOSIS

Primary postpartum haemorrhage

Chart 1, at the end of the session shows a summary of the causes of bleeding.

Give students this information.

It is very important to identify the causes of bleeding correctly since this will determine the management.

Is the bleeding atonic or traumatic? It is essential to find out why the woman is bleeding.

Atonic bleeding

Ask the students what atonic bleeding means.

Students should understand that atonic bleeding is bleeding from the placental site due to inability of the uterus to contract adequately. (Remind students of the physiology of the third stage of labour. Contraction of the myometrium is essential to control bleeding).

Ask the students:

- *how much is a normal blood loss?*
- *how much is a heavy blood loss?*
- *how much is a postpartum haemorrhage?*

They should be able to state that when there is vaginal bleeding:

- *up to 150 ml is a normal loss*
- *300 ml is a heavy loss*
- *500 ml is a postpartum haemorrhage*
- *any amount of blood loss is a PPH if the woman's condition deteriorates (may occur especially when the woman is anaemic).*

Remind students that research has shown that blood loss is frequently underestimated and therefore careful observation and measurement of blood loss is important.

What clue shows that the bleeding is atonic?

The uterus is not well contracted; it is soft, distended and lacking tone.

If the bleeding is atonic it is important to find out if the placenta has been delivered or not. When the third stage is managed actively, the placenta is normally delivered within 5–10 minutes of birth of the baby. It takes longer to separate and deliver during physiological management, 20–30 minutes.

The students should remember that the placenta is retained if it has not been delivered within one hour of the delivery of the baby.

If the placenta has not been delivered, is there bleeding?

There may be no bleeding if the placenta has not separated from the wall of the uterus. It is important to realise that bleeding can start at any time and can be severe. There will be bleeding if the placenta is partially separated. Remind students that sometimes blood collects in the uterus.

If the placenta has been delivered, ask if it appears complete.

A quick examination of the placenta at the bedside will establish if there is part of the placenta missing. Remember that a tiny part of placental tissue retained in the uterus can cause severe haemorrhage.

Are there other important clues (signs) to atonic bleeding?

Ask the students:

- *what other factors may cause the uterus to relax?*
- *what other factors may predispose to atonic PPH?*

It would be helpful here to discuss ideas. As a guide use the checklist in Session 3 on causes and risk factors to atonic PPH.

Ask if there are any questions relating to atonic PPH.

Summarize the facts already discussed about atonic PPH.

Traumatic bleeding

The students need to be able to identify traumatic bleeding.

Traumatic bleeding is bleeding due to trauma or injury of the genital tract.

Ask the students:

- *what clues (signs) tell you that the bleeding is traumatic?*

They should be able to state that the bleeding is traumatic when

- *there is vaginal bleeding, and*
- *the uterus is well contracted.*

It is important to find out where the bleeding point is.

Ask the students where the bleeding might come from. They should be able to state the following:

- *perineum - tear or episiotomy wound*
- *vulva - ruptured varicosities, tears or haematoma can occur (haematoma may not be obvious immediately after delivery, but can cause severe pain and shock)*
- *vagina - lacerations of the walls or rupture of varicosities*
- *cervix - lacerations can occur*
- *uterus - rupture or inversion of the uterus can also occur and are accompanied by marked pain and shock.*

The bleeding point may or may not be visible.

It is possible to quickly find the bleeding point if the bleeding is from the perineum, vulva or lower vagina.

If the bleeding point is not easily visible it will be necessary to:

- *insert a speculum to observe the upper vagina and cervix*
- *look for signs of ruptured uterus.*

Ruptured uterus

Ask the students what clues (signs) make us suspect a ruptured uterus.

They should state history of previous:

- *uterine scar due to caesarean section*
- *cephalo-pelvic disproportion (CPD) (the head of the baby is too big for the mother's pelvis)*

- *malpresentation, e.g. brow, shoulder or posterior face*
- *obstructed labour.*

Evidence of:

- *severe shock (rapid, weak pulse, low blood pressure, pallor, sweating, rapid breathing, anxiousness, confusion or unconsciousness, scanty urine output)*
- *collapse*
- *marked abdominal tenderness*
- *abdominal distension*
- *abnormal uterine contour (during labour or birth)*
- *easily palpable fetal parts (during labour or birth)*
- *absent fetal heart sounds and movements (during labour or birth)*
- *maternal tachycardia.*

A cervical tear may extend into the lower uterine segment during birth.

A vaginal tear may extend into the cervix and lower uterine segment during birth.

Ask if there are questions

Summarize traumatic haemorrhage.

Coagulopathy (clotting failure) and infection

There are two other factors which may occur whether the bleeding is atonic or traumatic. They are:

- *coagulopathy (clotting failure)*
- *infection (puerperal sepsis).*

It is always important to look for evidence of these factors because they make the danger of PPH greater.

Remind students how to recognize a clotting defect.

Blood normally clots within approximately 5 minutes. If it fails to clot within 7 minutes, there is a clotting defect. Clotting failure is both a cause and a result of massive obstetric haemorrhage. It can be triggered by abruptio placentae, intrauterine fetal death, septic shock, severe pre-eclampsia and eclampsia, amniotic fluid embolism and other causes. Coagulopthy should be suspected when there is delay in clotting time and a woman with one of the above conditions suddenly starts bleeding from multiple sites (e.g. vagina, nose, gums, skin).

In many cases of very heavy blood loss, the development of coagulopathy can be prevented if blood volume is restored promptly by infusion of IV fluids, either normal saline or Ringer's lactate.

Treatment of clotting failure includes treating the cause of coagulopathy, and giving a blood transfusion to replace clotting factors and red cells. If safe blood is not available, a suitable blood product should be used.

Puerperal sepsis (also known as metritis) may complicate PPH. It usually occurs after the first 24 hours following delivery, but may occur within the first 24 hours or even intrapartum (chorioamnionitis). Suspect puerperal sepsis if the woman has fever, lower abdominal pain, purulent, foul smelling lochia and a tender uterus. She may also develop septic shock.

It is important for students to understand how to identify the problem correctly. Accuracy is the basis for effective management.

Summarize the identification of primary PPH.

As you do so, display Chart 1.

Secondary or "delayed" postpartum haemorrhage

Ask the students:

What may cause secondary PPH?

They should be able to state the following:

- *retained products (membranes or placental tissue)*
- *shedding of dead tissue following obstructed labour (this may involve cervix, vagina, bladder or rectum)*
- *infection*
- *breakdown of the uterine wound after caesarean section or ruptured uterus.*

Ask the students:

How would you recognize secondary PPH?

They should describe the following:

- *there is bleeding from the genital tract in excess of normal lochia after 24 hours and during the first six weeks following delivery*
- *the uterus is larger and softer than expected for the length of time after delivery, i.e. subinvolution.*

If there is infection (puerperal sepsis) the following are often noted:

- *offensive lochia*
- *fever*
- *fast pulse*
- *anaemia.*

Puerperal sepsis makes the danger of secondary PPH greater.

Emphasize that secondary PPH is very dangerous because:

- *there can be repeated episodes of heavy bleeding*
- *it is often associated with puerpural sepsis*
- *it can lead to maternal death.*

Shock

When a woman has postpartum haemorrhage she can bleed very quickly and go into shock due to hypovolaemia. Students should recognize the signs of shock and should know how to assess its severity. Ask the students: What are the signs of shock? Use this table as a guide.

Table 1: Signs of shock

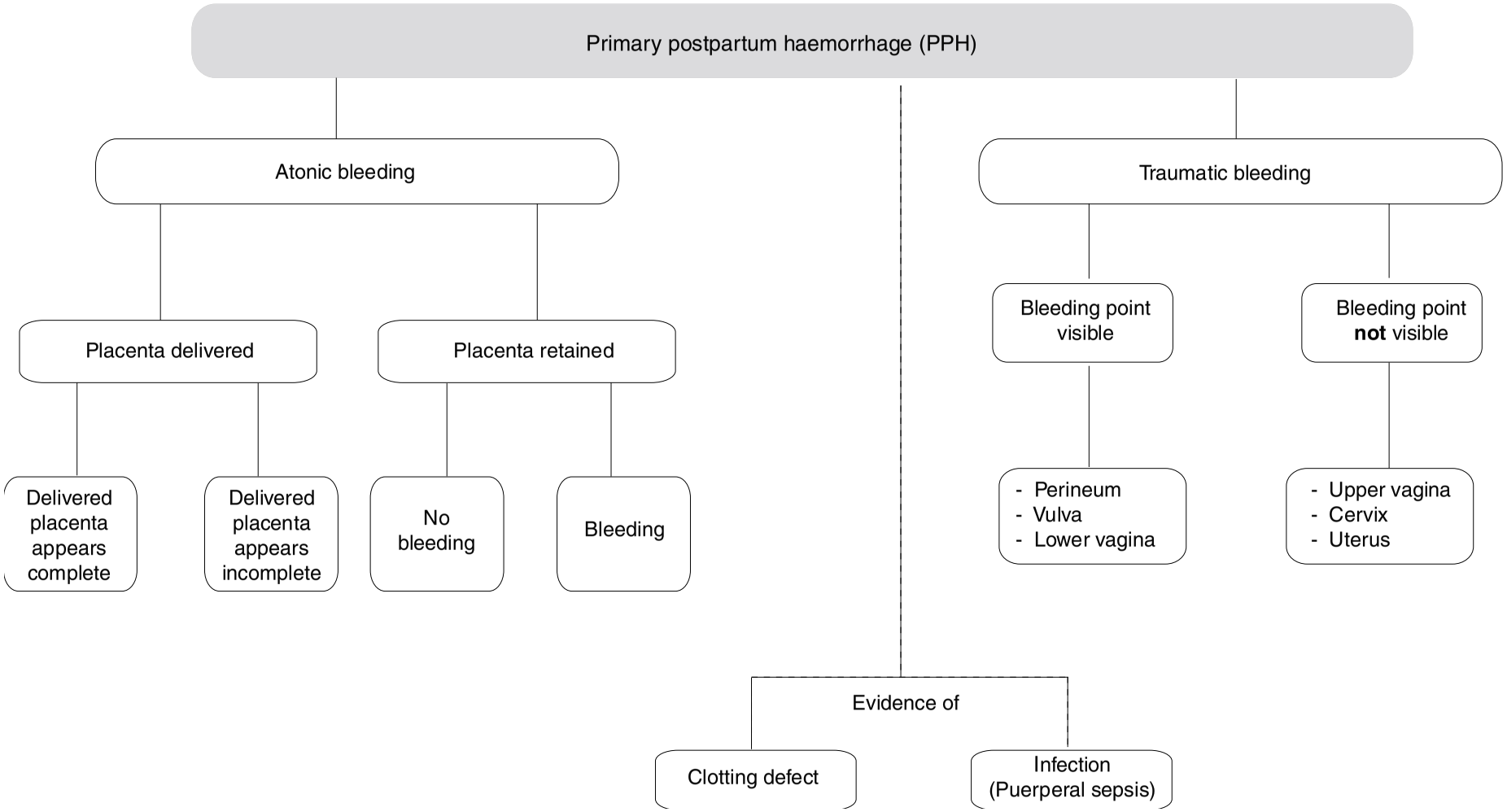
Early shock	Late shock
Awake, aware, anxious	Confused or unconscious
Fast pulse	Very fast and weak pulse, rate of 110 per minute or more
Slightly fast breathing	Fast and shallow breathing (rate of 30 per minute or more)
Pale	Marked pallor, especially of inner eyelid, palms or around mouth
Sweatiness	Cold, clammy skin
Low blood pressure	Very low blood pressure
Urine output of 30 ml per hour or more	Urine output of less than 30 ml per hour

Ask if there are any questions.

Summarize the entire session. Advise students to learn the information given in Chart 1.

You may wish to test the students' knowledge and understanding of the session by making up a quiz. Include the facts learned in sessions 2–4 of this module. You may also wish to include some revision of the third stage physiology and management. An example of a quiz is provided at the end of Session 1.

Chart 1: Primary postpartum haemorrhage: identifying the problem



5 MANAGING PRIMARY POSTPARTUM HAEMORRHAGE

SESSION 5
MANAGING PRIMARY POSTPARTUM HAEMORRHAGE

Aims

- To enable students to manage **primary** postpartum haemorrhage effectively.
- To enable students to understand the immediate steps to be taken to stop bleeding and resuscitate a woman, and to understand how and when to arrange for referral and safe transfer when necessary.

Objectives

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

- Explain the action which the midwife must take in order to stop bleeding due to primary PPH.
- Describe the management of atonic PPH when the placenta is delivered.
- Describe the management of atonic PPH when the placenta is retained.
- Describe the management of traumatic PPH.
- Explain the necessary care and the records which must be kept during transfer.

Plan

Modified lecture (2 hours).

Resources

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

INTRODUCTION

Remind students of the six steps to effective management on page 69. Explain that this session deals with how to manage primary postpartum haemorrhage, both atonic and traumatic.

The principles of managing PPH are:

- speed
- skills
- priorities.

The priorities in managing PPH are:

- call for help (to assist in controlling bleeding)
- make a rapid assessment of the woman's condition
- find the cause of the bleeding
- stop the bleeding
- stabilize or resuscitate the woman
- prevent further bleeding.

These are priorities. This means they must be done first and before anything else.

In order to do those things which are most important, it is often necessary to:

- change the order of what is usually done (e.g. it is usual to examine a woman from head to toe. If she is already having a postpartum haemorrhage when you are called to her, you need to quickly assess: colour, pulse, blood pressure and level of consciousness, how much blood she has already lost and immediately feel her uterus to determine whether it is atonic haemorrhage. This can be done in a few seconds. Further detailed examination can be carried out later and would waste time now). **Remember delay means death.**
- identify what must be done in order to save life.

The woman will die unless:

- the bleeding is stopped
- the woman is resuscitated or her condition is stabilized, this involves maintaining circulatory volume and managing shock.

Remind the students about the importance of identifying the problem.

Ask: *What is postpartum haemorrhage?*

Answer: A blood loss of 500 ml or more from the genital tract after the delivery of the newborn.

Ask: *(If the reply has not been included in the definitions offered to you), when do we consider a loss of less than 500 ml a postpartum haemorrhage?*

Answer: If the woman's condition deteriorates - e.g. in cases of anaemia.

Ask: *How do we define primary postpartum haemorrhage?*

Answer: Bleeding which occurs within 24 hours of delivery.

MANAGING ATONIC POSTPARTUM HAEMORRHAGE

Ask: *What is atonic bleeding?*

Answer: Bleeding from the placental site due to lack of tone in the uterus.

Ask: *What clue (sign) tells you that the bleeding is atonic?*

Answer: The uterus is not well contracted. It is soft, distended and lacking tone.

Explain that management will depend on whether the placenta is delivered or retained.

PPH - placenta delivered

Call for another health care professional if available. Otherwise ask an individual who is culturally acceptable to the community and family to help you, in order to stop the bleeding. A third person should take care of the newborn.

In order to stop the bleeding it is essential to make the uterus contract and empty it.

1. Massage the uterus to promote a contraction and expel any clots, because blood clots trapped in the uterus will inhibit effective uterine contractions.

2. Give oxytocin 10 IU IM.

3. Assess the woman's condition (pulse, blood pressure, colour, consciousness, uterine tone) and estimate how much blood has already been lost.

4. Start an intravenous infusion. Once the cannula is inserted, take blood for cross-matching and haemoglobin estimation, then infuse normal saline or Ringer's lactate, running it fast if the woman is in shock, (1 litre in 15 minutes) until the woman stabilizes* (you may need to infuse up to 3 litres to correct the shock).

5. Empty the bladder and keep it empty. Insert a catheter if the woman is unable to pass urine.

6. Check that placenta and membranes are complete.

7. Examine the cervix, vagina and perineum for tears.

If bleeding persists:

8. In order to keep the uterus well contracted, add 20 units of oxytocin to 1 litre of IV fluids, and infuse at 60 drops per minute. A second infusion line may be required if the first is running quickly to treat shock. Try putting the baby to the breast or use nipple stimulation if the baby will not suckle.

9. Perform bimanual compression of the uterus, or aortic compression to try and control the bleeding. See **Figure 7.6**, **Figure 7.7** and **Figure 7.8,** in Session 7.

10. Assess clotting status. Failure of a clot to form after 7 minutes, or a soft clot that breaks down easily, suggests coagulopathy. Transfusion with blood or blood products will be necessary.

11. If blood transfusion is not available locally and bleeding cannot be controlled, arrange for urgent referral to a higher level health facility.

12. Keep accurate records.

13. Accompany the woman to a higher level facility, arrange for her relatives/potential blood donor to also accompany her.

If bleeding persists:

14. Uterine and utero-ovarian ligation may be necessary.

15. If this fails to control the bleeding, a sub-total hysterectomy will be necessary.

Continuing management

Monitor the woman's condition carefully over the next 24–48 hours. This includes:

* Signs that the woman is stabilizing include a rising blood pressure (aim for a systolic blood pressure of at least 100 mmHG) and a stabilizing heart rate (aim for a pulse under 90).

- checking that the uterus is firm and well contracted
- blood loss (in order to estimate bleeding accurately, put a sanitary napkin or other clean material under the woman's buttocks and ask her to extend her legs and cross them at the ankles for about 20–30 minutes: the blood will then collect in the area of the pubic triangle)
- temperature
- pulse
- respiration
- blood pressure
- general condition (e.g. colour, level of consciousness)
- fluid intake (after the woman has stabilized, IV fluids should be given at a rate of 1 litre in 4–6 hours)
- blood transfusion should be monitored and the volume transfused recorded as part of the fluid intake
- urinary output
- keeping accurate records.

Before the woman goes home, her haemoglobin should be checked and iron supplementation should be given if indicated (because blood loss leads to depletion of iron stores in the body).

Where hookworm is endemic, give one of the following:

- albendazole 400 mg by mouth once, or
- mebendazole 500 mg by mouth once, or 100 mg twice a day for three days.

Things to avoid

Never leave the woman alone until:

- bleeding is controlled, and
- her general condition is good.

In atonic PPH, never insert a vaginal pack.

Referral and transfer

If you are in a home or health centre without the necessary skills and/or facilities, you should arrange referral to hospital if:

- the woman is shocked
- bleeding is not controlled
- coagulopathy is suspected
- the woman needs an exploration and evacuation of the uterus for retained products of conception.

Use the quickest available means of transport.

Remember delay means death. During transfer of the woman there are some essential things to remember (Table 2).

Ask if there are any questions.

Summarize the teaching so far.

Table 2: During transfer of woman with PPH, placenta delivered

Maintain	Use
Contraction of uterus	Fundal massage Bimanual compression of the uterus or aortic compression; repeat oxytocin 10 IU IM, if necessary
Empty bladder	Self-retaining catheter
Blood volume	IV fluids
Observation of condition	Check colour, pulse, blood pressure, blood loss, level of consciousness, check blood clotting time
Warmth of patient	Blankets
Accurate records	Charts, notes
Relatives prepared to give blood should accompany the patient	

PPH - placenta retained

The principles of management are the same as in cases where the placenta is delivered, but the placenta must be delivered as soon as possible to enable the uterus to contract effectively.

1. Assess the woman's condition (pulse, blood pressure, colour, consciousness, uterine tone) and estimate how much blood has already been lost.

2. Give oxytocin 10 IU IM.

3. Take blood for cross-matching and haemoglobin and set up an intravenous infusion (IVI). Use normal saline or Ringer's lactate initially and if the woman is in shock, run it fast (1 litre in 15 minutes) until the woman stabilizes.* (You may need to infuse up to 3 litres to correct the shock).

4. Empty the bladder.

5. Deliver the placenta by controlled cord traction when the uterus is well contracted.

6. Massage the uterus to promote a contraction and expel any clots.

7. Examine the placenta and membranes to ensure that they are complete.

* Signs that the woman is stabilizing include a rising blood pressure (aim for a systolic blood pressure of at least 100 mmHG) and a stabilizing heart rate (aim for a pulse under 90).

8. Add 20 IU of oxytocin to 1 litre of normal saline or Ringer's lactate and infuse at 40 drops per minute. A second intravenous line may be required to infuse fluids more rapidly in cases of shock.

9. If controlled cord traction is not successful in delivering the placenta, a gentle vaginal examination should be performed. If the placenta can be felt protruding through the cervix, it should be grasped with the fingers and steadily withdrawn from the uterus, which should be supported through the abdominal wall by the other hand.

10. If the placenta cannot be delivered, manual removal of the placenta should be performed. (See Session 9).

11. After manual removal of the placenta has been carried out, Continue IV infusion of oxytocin as in No 8 above.

12. Examine the vulva, vagina and cervix for tears.

If bleeding persists, continue with numbers 8–12 in the section headed, "Placenta delivered".

Continuing management

The points outlined on page 81 and page 82 for continuing management, also apply here.

Ask if there are any questions.

Summarize the teaching on atonic PPH.

MANAGING TRAUMATIC PPH

Ask: *What is traumatic bleeding?*

Answer: There is bleeding from the genital tract but the uterus is well contracted.

Ask: *Where might the bleeding be coming from?*

Answer:

- perineum - tear or episiotomy wound
- vulva - ruptured varicosities, tears or haematoma can occur (haematoma may not be obvious immediately after delivery, but can cause severe pain and shock)
- vagina - lacerations of the walls or rupture of varicosities
- cervix - lacerations can occur
- uterus - rupture or inversion of the uterus can also occur and are accompanied by marked pain and shock.

1. Take blood for cross-matching and haemoglobin estimation.

2. Set up an IV infusion; give normal saline or Ringer's lactate.

3. Place the woman in the lithotomy position and use good lighting.

4. Find the bleeding point, if visible, and clamp it. Then suture the tear if accessible. If not, prepare the woman for referral to a higher level health facility.

5. Estimate and record the blood loss.

6. Check pulse, blood pressure, and observe and record general condition.

If bleeding persists:

7. Test blood clotting time. If delayed to 7 minutes or more, or clots are very friable, clotting failure is likely. Refer to higher level health facility for blood transfusion.

8. Perform aortic compression (see **Figure 7.8** in Session 7).

9. Keep accurate records.

6 MANAGING SECONDARY POSTPARTUM HAEMORRHAGE

SESSION 6
MANAGING SECONDARY POSTPARTUM HAEMORRHAGE

Aims

- To enable students to manage **secondary** postpartum haemorrhage effectively.
- To enable students to understand the immediate steps to be taken in order to save life and prevent further complications, including prevention of infection.

Objectives

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

- Describe changes in normal lochia.
- Explain the action the midwife must take in order to stop bleeding due to secondary PPH.
- Describe the management of secondary PPH.
- Explain the infection prevention practices applicable to managing primary and secondary postpartum haemorrhage.

Plan

Modified lecture (1½ hours).

Resources

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

INTRODUCTION

Secondary, or "delayed", postpartum haemorrhage includes all cases of PPH occurring between 24 hours after delivery of the baby and 6 weeks postpartum.

Questions such as these will check students' understanding:

Ask: *How would you recognize secondary PPH?*

Answer: Students should understand that this is a loss in excess of normal lochia.

Ask: *What colour is lochia in the first days after delivery?*

Answer: Red.

Ask: *How long does it normally remain red?*

Answer: 3–4 days.

Ask: *When and how does lochia change colour?*

Answer: In 5–9 days, it becomes pink and for the next 2–3 weeks it is a yellowish or whitish colour.

Students should know about the normal changes in lochia. (If women are discharged on the day following delivery and students have had little or no experience of following them up to give postnatal care at home, they will not be familiar with the normal physiological changes. If they are not sure about what is normal they will find it very difficult to recognize the abnormal).

CHANGES IN NORMAL LOCHIA

The smell of normal lochia is described as a "heavy" smell, but it should not be offensive. If lochia smells offensive then it indicates infection. Infection can lead to secondary PPH or septicaemia. Both can cause maternal death.

The normal amount of lochia may be described as being similar to a heavy menstrual period during the first days but will vary in different women. However, it should not be excessive. If lochia is excessive, there are two important questions to ask.

1. Is there sudden excessive loss?

2. Is there a persistent excessive loss (sometimes noted as continuous passing of clots)?

The amount of lochia should become progressively less as the puerperium progresses.

Students need a lot of experience noting women with normal lochia so that when they see abnormal lochia they will recognize it immediately.

Ask students:

- *what are the causes of secondary PPH? (Students were introduced to these in Session 2).*

They should remember the causes:

- *retained fragments of placenta or membranes*
- *infection*
- *shedding of dead tissue following obstructed labour (in cervix, vagina, bladder, rectum)*
- *breakdown of uterine wound (after caesarean section or ruptured uterus).*

MANAGING SECONDARY PPH

Ask: What is the aim?

Answer: To preserve the life and health of the woman.

In order to do this we must use the same principles we learned in managing primary PPH.

Ask students to recall:

- *speed*
- *skill*
- *priorities.*

Priorities in managing secondary PPH

1. Admit the woman to a higher level health facility as an emergency.

2. Rub up a contraction by massaging the uterus if it is still palpable.

3. Assess the woman's condition and, if in a remote area, start management before transfer if possible.

4. Give oxytocin 10 IU IV.

5. Take blood for haemoglobin, grouping and cross-matching.

6. Put up an IV infusion. Use normal saline or Ringer's lactate initially. If the woman is in shock, run it fast (1 litre in 15 minutes) until the woman stabilizes. (The health care provider may need to infuse up to 3 litres to correct the shock).

7. If bleeding is severe, add 20 IU oxytocin per litre to the IV infusion and run it at 40 drops per minute. (The health care provider may need to set up a second IV line).

8. If severe anaemia, prepare for blood transfusion.

9. If there are signs of infection, (fever, foul-smelling vaginal discharge) give antibiotics as follows:

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

   Continue until the woman is fever-free for 48 hours.

10. If cervix is dilated, explore uterus by hand to remove retained products and clots. If cervix is not dilated, prepare for manual vacuum aspiration to empty the uterus. If facilities are not available locally, make appropriate referral.

11. Provide anti-tetanus prophylaxis, if necessary.

12. If there is no improvement with the above treatment, referral for assessment and probable surgery will be urgently required.

If there are signs of general peritonitis, the doctor will perform a laparotomy to drain the pus. If the uterus is necrotic and septic, a sub-total hysterectomy will be performed.

Examination

Monitor the woman's condition very carefully. This includes:

- temperature
- pulse
- respiration
- blood pressure
- blood loss/lochia including amount (if clots, membranes, tissue present), smell, consistency, evidence of pus
- general condition (e.g. colour, level of consciousness, nausea, vomiting)
- fluid intake and urinary output

- pain, note site and severity
- keeping accurate records.

Provide good midwifery care, which includes:

- physical comfort and hygiene
- emotional support
- carrying out medical instructions
- reporting any changes to the doctor.

Ask if there are any questions.

Summarize.

INFECTION PREVENTION INFORMATION

Infection prevention procedures are critical to the management of any complication in pregnancy and childbirth. However, if this section has been included recently in a previous technical module, it will only be necessary to review the information here.

Women with either primary or secondary postpartum haemorrhage are more at risk, as not only will they have been subject to more interventions that put them at risk, but blood loss and anaemia are added risk factors. 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 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.

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 - do not use shared towels.

Hands should 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 most simple and 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 therefore 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 recleaned and sterilized again.

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 and 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.

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 postpartum haemorrhage.

Objectives

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

- Identify in practice the factors which place a woman at increased risk of postpartum haemorrhage. Explain why there is a risk and how risks may be reduced.
- Manage the third stage of labour, recognize signs of complications and respond accordingly.
- Carry out examination of the placenta and membranes, identifying abnormalities. Estimate blood loss and keep accurate records of care given during the third stage of labour.
- State the reasons for urinary catheterization in labour and discuss how this can help prevent and manage PPH.
- Demonstrate the technique of urinary catheterization illustrating the importance of aseptic technique, gentle handling and sensitivity in approach.
- Perform the observations which must be recorded in order to monitor a woman's condition in the management of PPH and interpret the significance of these readings.
- Demonstrate uterine massage which can be used to promote contractions of the uterus and explain the indications and reasons for doing this.
- Demonstrate venepuncture in order to obtain a blood specimen for laboratory analysis, completing the necessary request forms.
- Describe the steps necessary to protect staff and patients from the introduction of infection, especially from body fluids.
- Set up an intravenous infusion stating the indications for doing so, the precautions to be taken and the records which must be kept.
- Identify suitable IV fluids which can be administered in order to replace reduced circulating fluids following PPH. Discuss the use of each.
- Discuss the indications for blood transfusion and demonstrate care during administration, illustrating the importance of careful observation.
- Discuss the use of bimanual compression in controlling atonic PPH and demonstrate the technique using a teaching aid and, where appropriate, in clinical practice.
- Demonstrate the technique of manual compression of the aorta.
- Discuss general principles of safe practice in relation to repair of the perineum following delivery.
- Demonstrate the ability to repair perineal trauma due to tears.

- Demonstrate the procedure of episiotomy and repair.
- Explain the prescription, ordering, storage and administration of drugs, and demonstrate the ability to administer the necessary drugs.
- Demonstrate the ability to maintain accurate records.

Plan

Lecture (2 hours).

Clinical teaching (2 hours per small group of students per skill, as well as an appropriate 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)*.

Simulation equipment as required.

Skills checklists.

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, practicing midwife or medical practitioner. Whilst learning these skills, students should be provided with ongoing supervision.

Each skill is organized under three headings: ***Teaching method****;* ***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 student, for each of the skills. Copies of the forms could then be used for each student being assessed. An example of a skills checklist can be found at the end of Session 1, but you may wish to design your own or adapt/update one used locally.*

The skills "Identifying risk factors", "Managing the third stage of labour" and "Examination of placenta and membranes" will have been taught during Sessions 1 and 2 and should be reviewed here in the context of managing PPH.

Remind students that the infection prevention practices described with respect to managing primary and secondary PPH (Session 6) apply to the skills in this session.

SKILL: IDENTIFYING FACTORS WHICH PLACE A WOMAN AT INCREASED RISK OF POSTPARTUM HAEMORRHAGE

Teaching method

Clinical examination of a postnatal woman in small groups. Before going to clinical area, review Session 3 with the students.

Teaching content

1. *Divide the students into groups of two or three.*

2. *Take them into the clinical area. This can be*

   - *an antenatal clinic,*
   - *an antenatal ward, or*
   - *a labour ward.*

3. *Give them the following instructions:*

   a. *Select a woman who has not yet delivered.*
   b. *Obtain permission from*
      - *the nurse/midwife responsible for care*
      - *the woman herself, and*
      - *her relative(s) if appropriate.*
   c. *Read the woman's history recorded in the case notes.*
   d. *Talk to the woman in order to update any details in her records.*
   e. *Carry out a full clinical examination of the woman.*
   f. *Identify factors which place the woman at increased risk of PPH.*

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

This exercise helps students identify risk factors for PPH predating the woman's present pregnancy and those arising during her present pregnancy (Table 4).

Risk factors can sometimes be identified by careful history taking and physical examination. The factors are important because they can show which women are at high risk of PPH so that action can be taken to make sure they deliver in a facility capable of managing the haemorrhage, if and when it occurs.

Unfortunately, the predictive value of some antenatal risk factors is low, especially factors that are very common such as high parity. Only a few women who have a PPH have an identifiable risk factor during the antenatal period. In many cases there are no identifiable risk factors, yet the woman may bleed profusely.

The factor which seems to be particularly useful in identifying women likely to have a PPH is a history of previous retained placenta and/or previous PPH.

Also it is very important to identify risk factors that do not make PPH more likely but make it more dangerous. These factors include conditions such as uterine infection (chorioamnionitis) and anaemia.

Students should have identified the following factors which place the woman at increased risk of PPH, or which make PPH more dangerous.

Table 4: Factors which place women at increased risk of PPH

Pre-dating present pregnancy	Arising during present pregnancy	Arising during labour
High parity (5+)	Placenta praevia	Induced labour
	Abruptio placentae	Prolonged/ obstructed labour
Fibroids	Polyhydramnios	Precipitate labour
Previous retained placenta, previous PPH	Multiple pregnancy	Forceps delivery
Previous surgery to the uterus including previous caesarean section	Intrauterine death	Caesarean section
Previous prolonged/ obstructed labour	Eclampsia	General/epidural anaesthesia Chorioamnionitis
Medical disorders e.g. idiopathic thrombocytopenia	Use of tocolytic drugs in pregnancy for preterm labour	Inversion of the uterus
Anaemia	Any condition associated with anaemia (e.g. malaria, hookworm)	Coagulopathy (clotting failure)

In checking students' understanding, ask them why each factor makes PPH more likely to occur.

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 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: MANAGING THE THIRD STAGE OF LABOUR

Teaching method

This obviously has to be carried out during the actual care of a woman in the third stage of labour. Ideally the student will have already cared for the woman in the first and second stages.

It is essential to include the active management of the third stage as this is the preferred method of management because blood loss is reduced and the third stage shorter.

Teaching content

Use the checklist on third stage management introduced in Session 1 as a guide for teaching and assessing the students.

Assessing competence

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

1. *Does the student demonstrate ability to complete the sub-tasks listed in checklist A or B at the end of Session 1?*

2. *Does the student complete these tasks*

   - *skilfully?*
   - *gently?*
   - *at the correct speed?*

3. *Does the student anticipate problems and take steps to reduce them.*

SKILL: EXAMINATION OF PLACENTA AND MEMBRANES AND ESTIMATION OF BLOOD LOSS

Teaching method and teaching content

*Examination of the placenta has been demonstrated in Session 1, (**Figure 1.17**). If the students are regularly gaining experience in the management of labour they should now be very familiar with this basic skill.*

Estimation of blood loss has been discussed in Session 2.

It would be suitable to assess this immediately after "Managing the third stage of labour".

Assessing competence

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

1. *Does the student carry out the examination thoroughly and systematically?*

2. *Does the student know how to recognize abnormalities?*

3. *Does the student know what are the most important parts of the examination?*

4. *Can the student explain why the examination is important?*

5. *Does the student estimate blood loss accurately?*

6. Do the student's records accurately reflect her/his observations?

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 7.1****.*

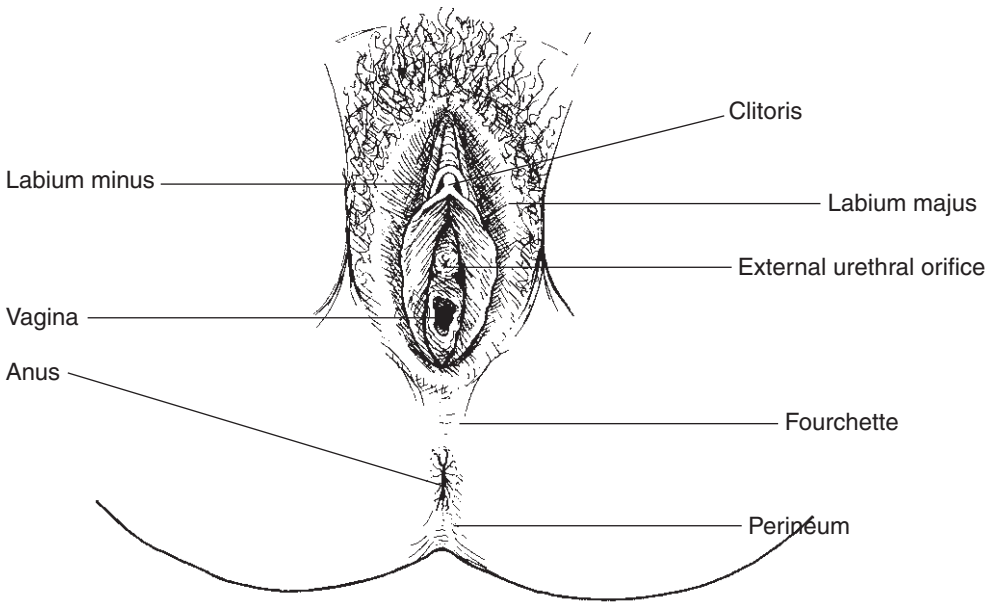


Figure 7.1 Female external genital organs

Procedure

Clean the genital area with clean water. 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 with the right hand (**Figure 7.2**). 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.

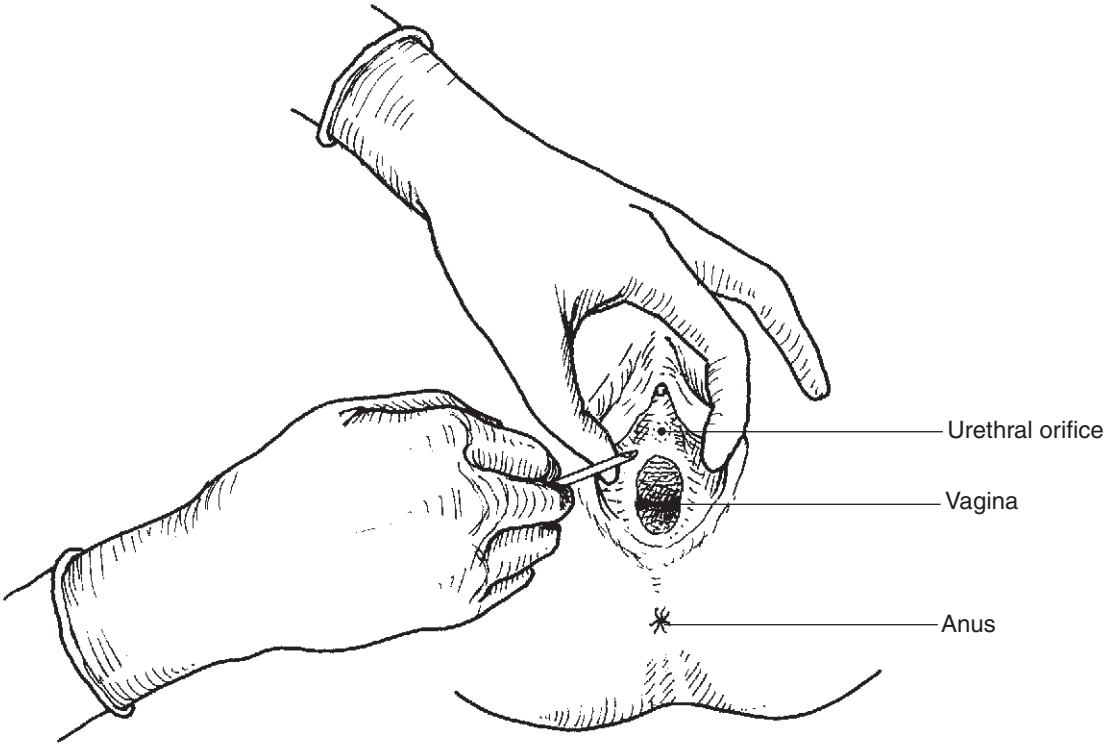


Figure 7.2 Urinary catheterization: separating the labia and introducing the catheter into the urethral orifice

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 PPH
- clear explanation to the woman of what is being done.

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 for many hours.

Indications for catheterization

Urinary catheterization should be done only when absolutely 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 and second stages of labour a full bladder may delay the descent of the head, cause poor uterine contractions, and result in injury to the urinary tract

- during the third stage of labour a full bladder may prevent proper placental separation, interfere with the ability of the uterus to contract, and lead to 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, vacuum extraction, symphysiotomy) are done, the bladder has to be emptied to reduce the risk of injury
- in the management of eclampsia it is important to monitor the urinary output, in which case, a self-retaining catheter must be left *in situ*.

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/he 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/his findings?*

SKILL: TAKING AND RECORDING OBSERVATIONS

Teaching method

Small groups in the clinical area.

Teaching content

1. *Divide the students into groups of two or three.*

2. *Take them into the clinical area. This can be:*

   - *an antenatal clinic*
   - *an antenatal ward, or*
   - *a postnatal ward.*

3. *Demonstrate the observations listed on the next page.*

4. *The students can practise some observations on each other before doing so on clients.*

5. *Check the observations to test accuracy.*

6. *Ask the students to tell you:*

   - *the normal range in the reading or expected observation*
   - *the significance of abnormal readings in the context of PPH.*

Note: If students are already trained nurses they will be able to make some of the observations, but will need to learn about their significance in midwifery care during the third stage of labour.

It is always good to teach and assess during the normal process of giving care rather than creating an artificial situation.

Spend some time looking at the charts which are kept by midwives.

Ask students to record their observations on the appropriate charts and check them. They should also state the significance of their findings, and what problems they would be looking for. These should include:

- **Temperature**: a rise may indicate the presence of an infection
- **Pulse**: a rising pulse is one of the signs of haemorrhage; a weak and rapid pulse indicates shock from loss of blood
- **Respirations**: in shock they are at first shallow and fast and later deep and irregular
- **Blood pressure**: in early shock the systolic pressure is below 90 mmHg; in very severe shock it is unrecordable
- **General condition**:
  - colour: pale or grey in cases of shock
  - level of consciousness: (this can be assessed by talking to the woman and listening to her reply. This gives quick indication of the fact that she is conscious
- The tone of the uterus, whether it is soft and distended, or firm and well contracted, can be easily demonstrated with the cooperation of a newly delivered mother. The following skill "Massaging the uterus to expel clots" can be demonstrated and assessed at this time if the woman's condition needs this action.

Assessing competence

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

1. *Can the student accurately make the observations?*

2. *Can the student accurately record the observations?*

3. *Are the student's records complete?*

4. *Does the student know what is normal/the normal range for each observation?*

5. *Can the student explain the significance of the observations made?*

6. *Can the student give illustrations of what is abnormal and what problems these indicate in the third stage of labour?*

7. *Can the student state which observations should be used, and how regularly, when a woman is having/has had a PPH?*

SKILL: MASSAGING OF THE UTERUS AND EXPELLING CLOTS

Teaching method and teaching content

This is best taught during the giving of care.

1. *Divide the students into groups of two or three.*

2. *Take them to the bedside of newly delivered women who need observation and care.*

3. *Demonstrate how the uterus should be massaged gently but firmly, expelling any clots.*

4. *Make sure that students know from experience what a well-contracted uterus feels like.*

5. *Instruct students to gently feel the uterus of a woman immediately after the delivery of the placenta and note its position and hardness.*

6. *Assist students to become familiar with the feel of a normal well-contracted uterus and also with a large, soft, poorly contracted uterus immediately after delivery.*

7. *Instruct students to palpate gently the uterus of a postnatal woman when her bladder is full and then again when her bladder is empty. They should note the change in position as well as the change in fundal height which can occur.*

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 skilfully and gently massage the uterus and expel clots?*

2. *Can the student explain the importance of massaging the uterus?*

3. *Can the student distinguish between a uterus which is well contracted and one which is not well contracted and discuss the possible reasons accurately?*

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 7.3**).*

*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 7.4**).*

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 tests you teach 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.

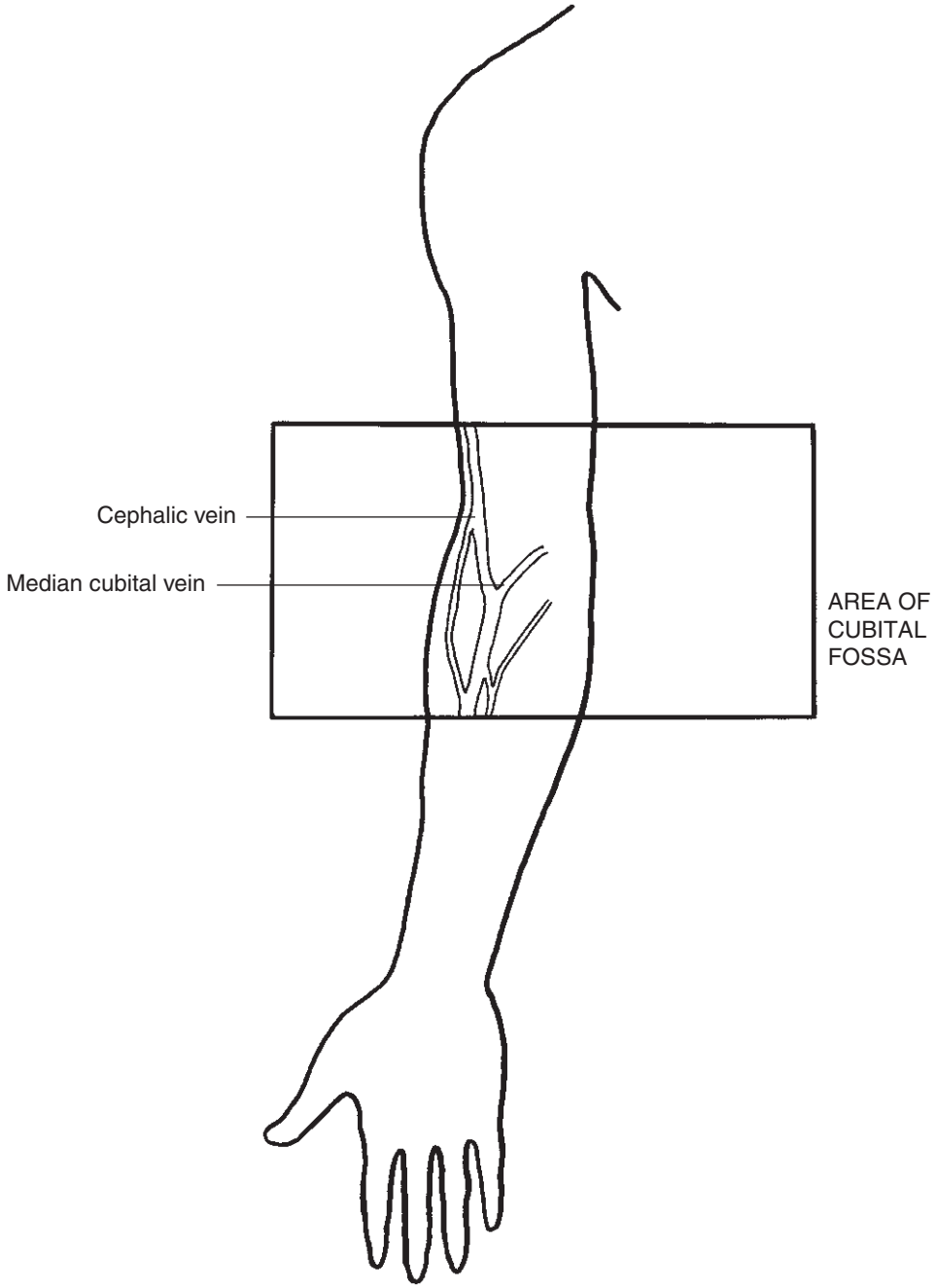


Figure 7.3 Important veins of the cubital fossa (right arm)

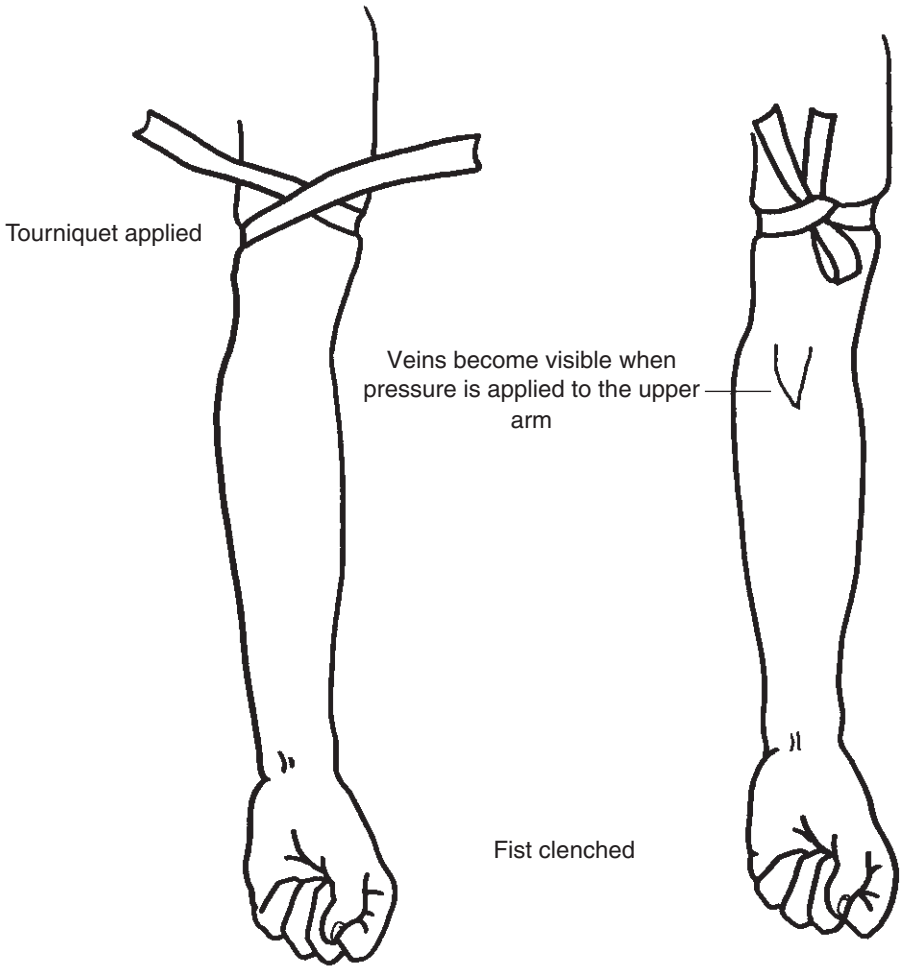


Figure 7.4 Applying a tourniquet to find a vein

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 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 the 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 7.4**)
   - 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 a clean swab, use of sterile needle.

9. Precautions against injuries: using gloves if the woman is in a high risk category, i.e. infected with human immune deficiency virus (HIV), 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 correctly and 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 her/his own skill and request assistance when needed?*

7. *Does the student dispose of used syringes and needles safely?*

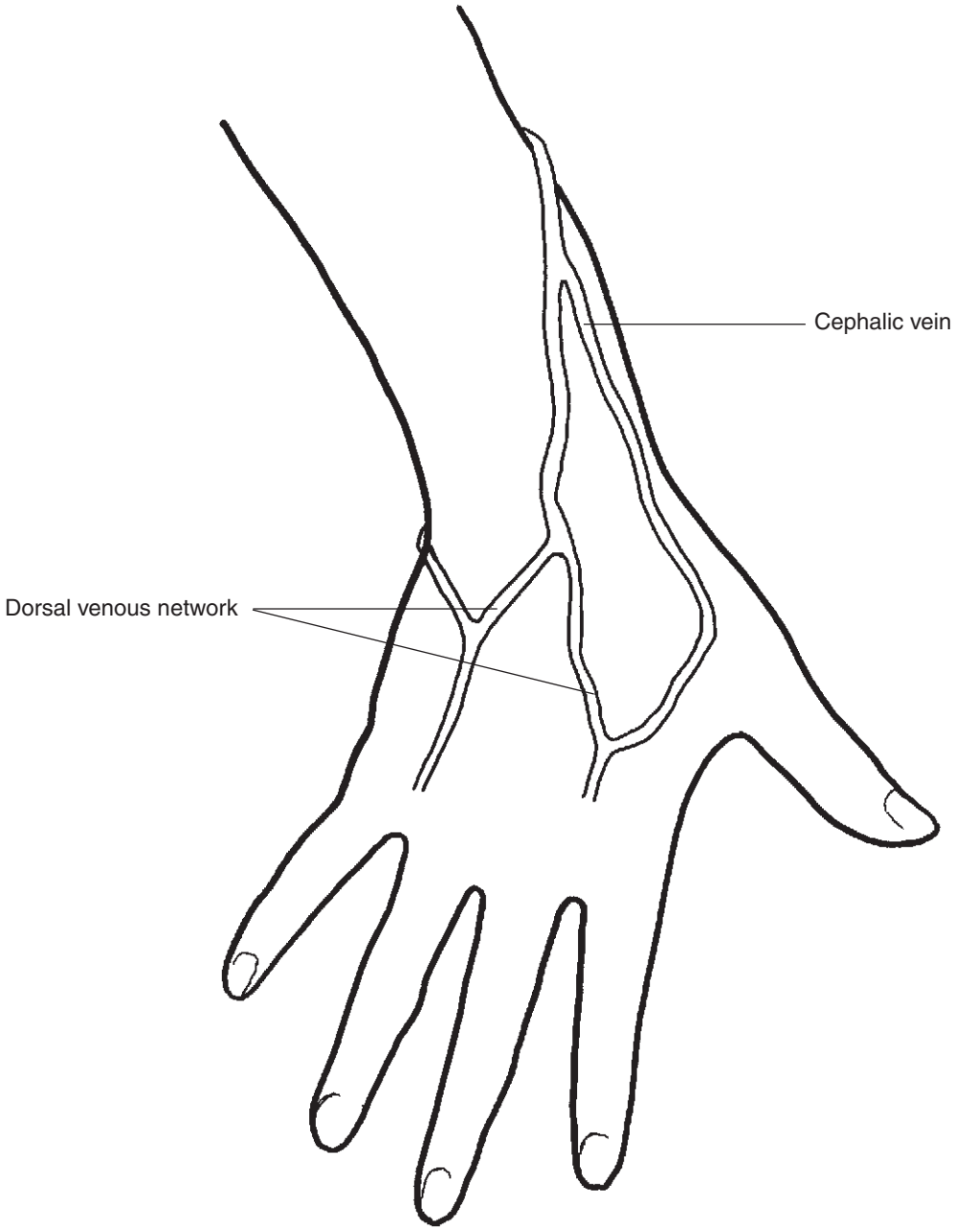


Figure 7.5 Important veins of the forearm and back of hand

SKILL: SET UP AND MONITORING 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 veins near a joint. The forearm or back of the hand are best (see **Figure 7.5**).*

*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 (see **Figure 7.4**).*

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 urgent.

Teaching content

Selecting the appropriate fluid:

Normal saline or Ringer's lactate should be given prior to blood transfusion, because these fluids can be given quickly and are also useful to correct blood volume and blood pressure quickly. They can be given without delay while blood is being cross-matched.

Blood is given in cases of severe shock following haemorrhage, following loss of a large volume of blood during operative delivery, to correct clotting failure and to treat severe anaemia late in pregnancy or if accompanied by cardiac failure. Blood, and blood products are sticky and cannot be given fast.

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 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, cut ready in strips
   - drip stand or nail in the wall
   - rubber tourniquet
   - splint with bandage if the woman is restless or unconscious
   - clean swabs for cleaning the site of the IVI
   - gloves.

3. Ensure that the woman (and her relative if present) understands why she needs to have an IVI inserted, and explain the procedure. Make sure she is in a comfortable position with arm extended.

4. Correct site of 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 with clean swabs (use gloves to protect yourself if the woman is in a high risk category: HIV, 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 IVI 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 Ringer's lactate as quickly as possible; repeat 1 litre every 15 minutes until signs of improvement are evident (e.g. pulse begins to slow, blood pressure begins to rise), then give 1 litre every 4–6 hours.

9. Monitor fluid balance, blood loss, pulse, blood pressure, respirations and urinary output.

10. 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.

11. Complications of intravenous infusions:

    - ***local problems:***
      thrombophlebitis (infection of the vein) and swelling at the injection area (due to leakage of fluid 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 fluid.

      circulatory overload:
      giving too much intravenous fluid too fast can cause heart failure and the lungs may fill up with fluid. Usually 1 litre is given 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 fluid 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 ml, while another type may have only 10 drops per ml.

Table 5 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, you must know the number of drops per ml, which will depend on the type of tubing being used.

Table 5: 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.

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?*

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

3. *Does the student protect the woman, herself/himself and any assistant(s) from 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 and accurately interpreting the signs that indicate improvement and deterioration?*

6. *Does the student explain the procedure 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?*

SKILL: MONITORING BLOOD TRANSFUSION

Teaching method

If students have had no previous training, introduce them to the theoretical knowledge in the classroom, and proceed with clinical teaching. Make use of the care of any clients receiving blood transfusion. These need not be maternity clients, but teach the principles of blood transfusion and apply them to midwifery care.

Teaching content

Students should be familiar with the following:

1. The indications for blood transfusion:

   - severe shock due to postpartum haemorrhage
   - loss of a large volume of blood at operative delivery
   - treatment of clotting failure
   - severe anaemia in late pregnancy, or if accompanied by cardiac failure.

2. Risks associated with blood transfusion:

   - possibility of transmission of infectious agents (e.g. human immune deficiency virus (HIV), hepatitis B and C, syphylis, malaria and Chagas disease
   - incompatibility and serious haemolytic transfusion reactions
   - any blood product can become contaminated with bacteria and is very dangerous if it is manufactured or stored incorrectly.

Plasma transfusion carries much the same risks as blood transfusion, thus there are few clear indications for plasma transfusion.

3. Blood safety. The risks associated with blood transfusion can be reduced by:

   - effective blood donor selection, including deferral and exclusion of those who are unsuitable
   - screening for infections which can be transmitted in the blood donor population
   - quality assurance programmes in all areas associated with blood and blood products for transfusion, e.g. donor selection, collection of blood, screening, blood grouping and other tests, storage, transportation and administration of blood and blood products
   - high quality blood grouping, compatibilty testing, component separation and storage and transportation of blood and blood products
   - appropriate clinical use of blood and blood products.

4. Screening for infectious agents. All donated blood should be screened for the following infections which can be transmitted by transfusion:

   - HIV-1 and HIV-2
   - Hepatitis B
   - Treponema pallidum antibody (syphilis).

   Where possible it should also be screened for:

   - Hepatitis C
   - Chagas disease, in countries where it is prevalent, e.g. Central and South America. (This is a parasite found in the faeces of house bugs, mainly in primitive housing, and in domestic animals. Entry is often through the conjunctiva and spreads to cause a generalised febrile state and lymphadenopathy, splenomegaly and involvement of the central nervous system). It may lead to death
   - Malaria. In areas with a high prevalence of malaria, blood transfusion should be accompanied by prophylactic malarials

     No blood or blood products should be released for transfusion until all tests are shown to be negative.

     Compatibility tests should also be performed on all blood components, even if, in life-threatening emergencies, they are performed after they have been issued.

5. The main blood groups and rhesus factor.

   - The four main blood groups should be discussed, e.g. A, B, O, and AB.

In addition the rhesus factor should be understood.

6. Essential precautions are essential to avoid giving a mismatched transfusion. Here it would be wise to review the maternity unit's policy or protocol which lays down rules for administration of blood and avoiding accidents.

7. Careful monitoring during blood transfusion is essential to detect early symptoms and signs of adverse effects. It should be carried out at the following stages:

   - before starting the transfusion
   - at the onset of the transfusion
   - 15 minutes after starting the transfusion
   - at least every hour during the transfusion
   - at 4–hourly intervals after completing the transfusion.

8. Observations which must be made and accurately recorded during transfusion are as follows:

   - general appearance
   - temperature
   - pulse
   - blood pressure
   - respiration
   - urinary output
   - fluid balance (oral and IV fluid intake and urinary output)
   - adverse symptoms and signs, e.g. burning sensation along the vein where the transfusion is being given, facial flushing, chills and fever, headache, low back pain, rash, red urine, wheezing and shock.

   Immediate resuscitation is required if anaphylactic shock occurs.

9. Responding to transfusion reaction:

   - stop the transfusion immediately
   - keep the IV line open with normal saline or Ringer's lactate
   - seek expert advice.

   If the reaction is mild, treat with oral promethazine 10 mg and observe closely.

   In cases of anaphylactic shock, the following treatment is given:

   - manage as for any state of shock
   - give adrenaline 1:1000 solution 0.1 ml in 10 ml normal saline slowly IV

- give promethazine 10 mg IV
- give hydrocortisone 1 g IV every 2 hours as needed
- treat bronchospasm with aminophyline 250 mg in normal saline 10 ml IV slowly
- in addition, resuscitative measures will be carried out, as required
- monitor renal, pulmonary and cardiovascular functions
- transfer to higher level health facility when stable, if not already in such a facility.

10. Documenting a transfusion reaction. Immediately after the reaction, take the following samples and send with request forms to the blood bank for laboratory investigations:

    - immediate post-transfusion blood samples, one clotted and one anticoagulated: EDTA/sequestrene from the vein opposite the infusion site
    - blood culture
    - the blood unit and giving set (containing red cell and plasma residue from the transfused donor blood)
    - the first specimen of urine from the woman after the reaction.

A transfusion reaction form should be completed.

After the initial investigations of the transfusion reaction, send further specimens to the blood bank for laboratory tests, as requested. Both the medical officer and blood bank which supplied the blood must be notified immediately of any acute reaction to blood transfusion.

Record the following information on the woman's chart:

- type of transfusion reaction
- length of time after the start of the transfusion that the reaction occurred
- volume and type of blood products transfused
- unique donation numbers of all products transfused.

Assessing competence

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

1. *Does the student know the indications for blood transfusion?*

2. *Does the student know the risks associated with blood transfusion?*

3. *Does the student take great care to ensure that the blood to be transfused is the correct blood for the woman, before starting the transfusion?*

4. *Does the student monitor the woman's condition with extreme care, as previously indicated, throughout and after the transfusion?*

5. *Can the student accurately describe the symptoms and signs which may occur in a woman who has an adverse reaction to a transfusion?*

6. *Does the student know how to respond appropriately to an adverse transfusion reaction?*

7. *Does the student know how to document an adverse reaction to transfusion?*

8. *Does the student keep appropriate records?*

9. *Does the student keep empty bags/bottles without washing them and return these to the laboratory?*

10. *Does the student recognize the limitations of her/his own skills and request assistance when necessary?*

SKILL: APPLYING BIMANUAL COMPRESSION TO THE UTERUS

Teaching method

Remind students that bleeding from the placental site will not be controlled unless the uterus contracts. If this does not happen after the usual procedures of emptying the uterus and giving an oxytocic drug, then bimanual compression can be very helpful. Bimanual compression can be either external or internal.

These details can be taught in the classroom. Use a small bag filled with beans to represent the uterus. This will enable the students to appreciate how they can grasp the uterus between both hands.

Describe the technique. Demonstrate it using the "teaching model". In the clinical situation it is possible to demonstrate external bimanual compression on a woman who needs this because of PPH.

On a newly delivered woman, it is easier in the multiparous woman with lax abdominal walls. Demonstration in this case should be done just to show the position of the hands and the direction of the pressure. Never submit a woman to unnecessary discomfort for teaching purposes only.

Teaching content

External bimanual compression

1. Place the left hand on the fundus and make it go down as far as possible behind the uterus.
2. Place the right hand flat on the abdomen between the umbilicus and the symphysis pubis.
3. Press the hands towards each other in order to compress the uterus and thereby the blood vessels at the placental site (**Figure 7.6**).

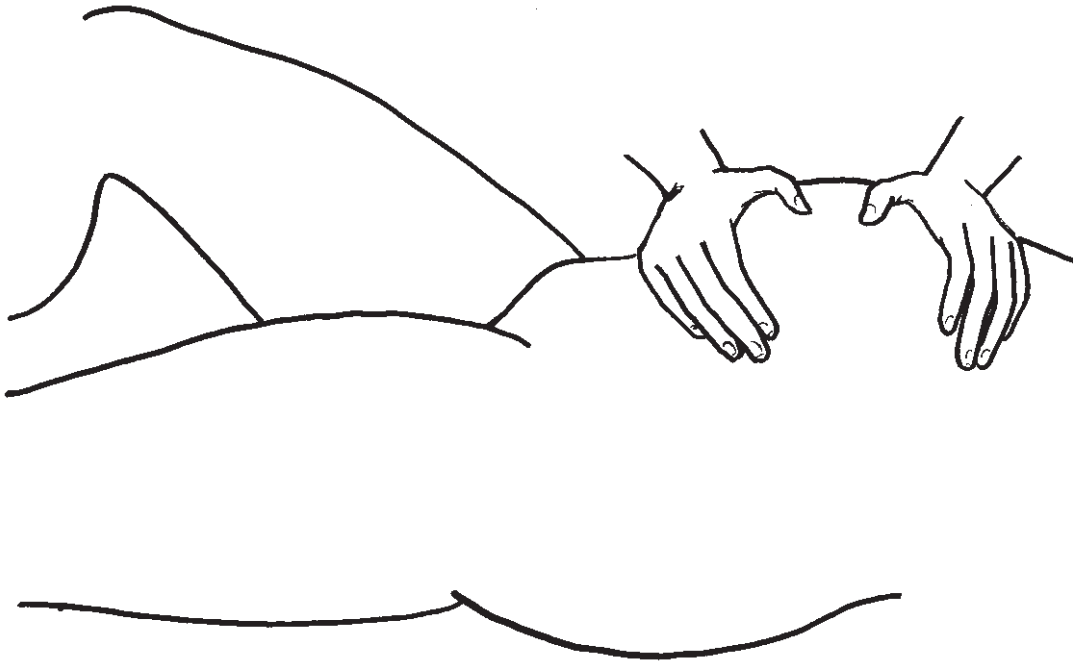


Figure 7.6 Hand positions for external compression of the uterus

Internal bimanual compression

This is more effective than external compression (**Figure 7.7**).

1. Wash and scrub hands.
2. Wear sterile gloves, preferably elbow-length gloves.
3. Insert a gloved hand into the vagina and form a fist in the anterior vaginal fornix. Apply pressure against the anterior wall of the uterus.
4. At the same time, the other hand is placed deeply into the abdomen behind the fundus of the uterus and pressure is applied against the posterior wall of the uterus.

5. Maintain compression until bleeding is controlled and the uterus contracts.

Internal bimanual compression is advisable:

- in severe haemorrhage if external compression is not effective
- when the woman is anaesthetized
- if bleeding persists after manual removal of the placenta.

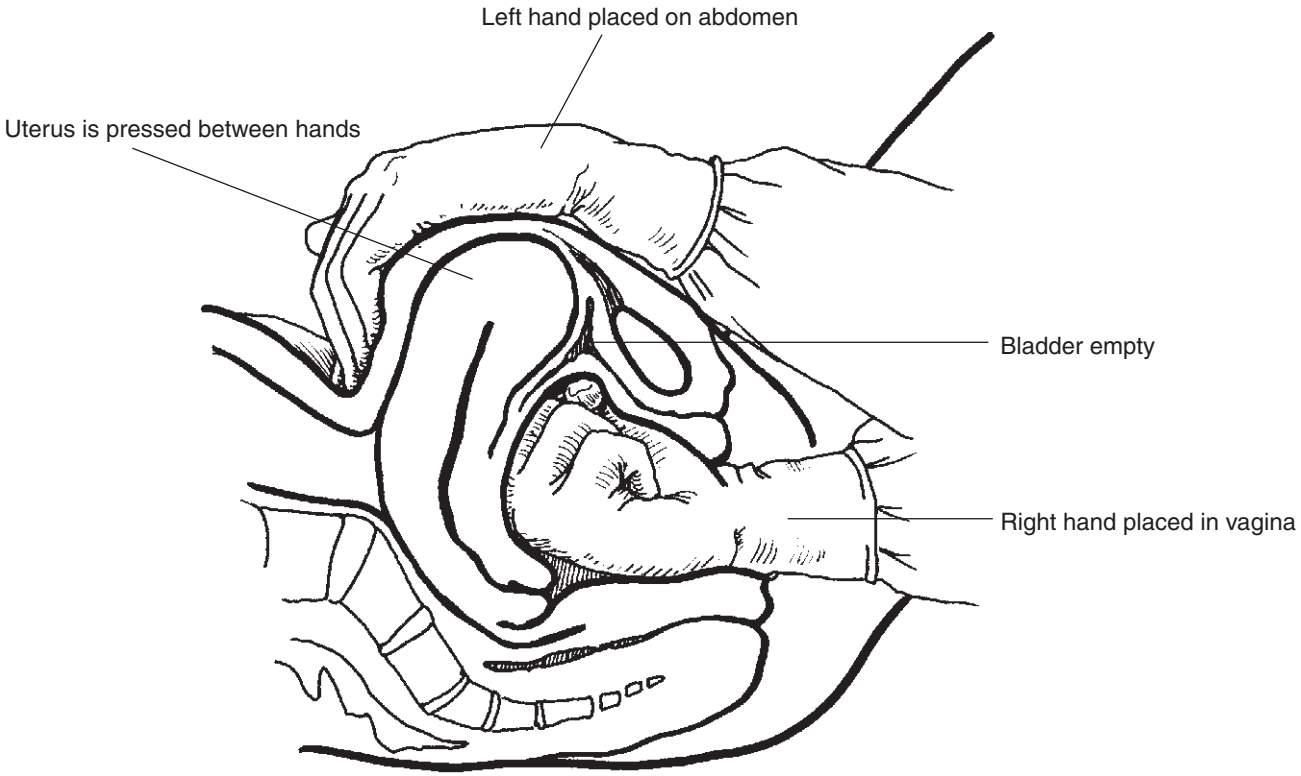


Figure 7.7 Internal bimanual compression of the uterus

Assessing competence

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

1. *Does the student understand:*

   - ***when** to use external bimanual compression?*
   - ***how** to use external bimanual compression?*
   - ***why** external bimanual compression can be effective?*

2. *Does the student understand:*

   - ***when** to use internal bimanual compression?*
   - ***how** to use internal bimanual compression?*
   - ***why** internal bimanual compression can be effective?*

3. *If the opportunity arises in practice, does the student effectively compress the uterus in order to control the bleeding?*

SKILL: APPLYING MANUAL COMPRESSION TO THE AORTA

Teaching method

Describe the technique. The demonstration can be performed on a dummy or on any newly delivered woman, but in this case only to show the position of the hands and the direction of the pressure.

Teaching content

Manual compression of the aorta can be used in cases of severe haemorrhage instead of bimanual compression of the uterus. It is less invasive than internal bimanual compression and an effective treatment. It can also be applied more quickly as there are no aseptic precautions to consider (**Figure 7.8**).

The procedure is carried out as follows:

- downward pressure is applied through the abdominal wall with a closed fist placed over the abdominal aorta; the point of compression is just above the umbilicus and slightly to the left. Aortic pulsations can often be felt easily through the abdominal wall in the immediate postpartum period
- with the other hand, palpate the femoral pulse to check the adequacy of the compression. If the femoral pulse is palpable during compression, it is not effective. Check the position of the fist and exert more pressure until the femoral pulse is no longer palpable
- maintain compression until bleeding is controlled.

Assessing competence

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

1. *Does the student understand when and how manual compression of the aorta can be used?*

2. *Does the student know the reason for palpating the femoral pulse and react appropriately, if it is palpable?*

3. *Can the student demonstrate the correct position of the fist over the abdominal aorta?*

4. *Can the student demonstrate the procedure correctly on a model?*

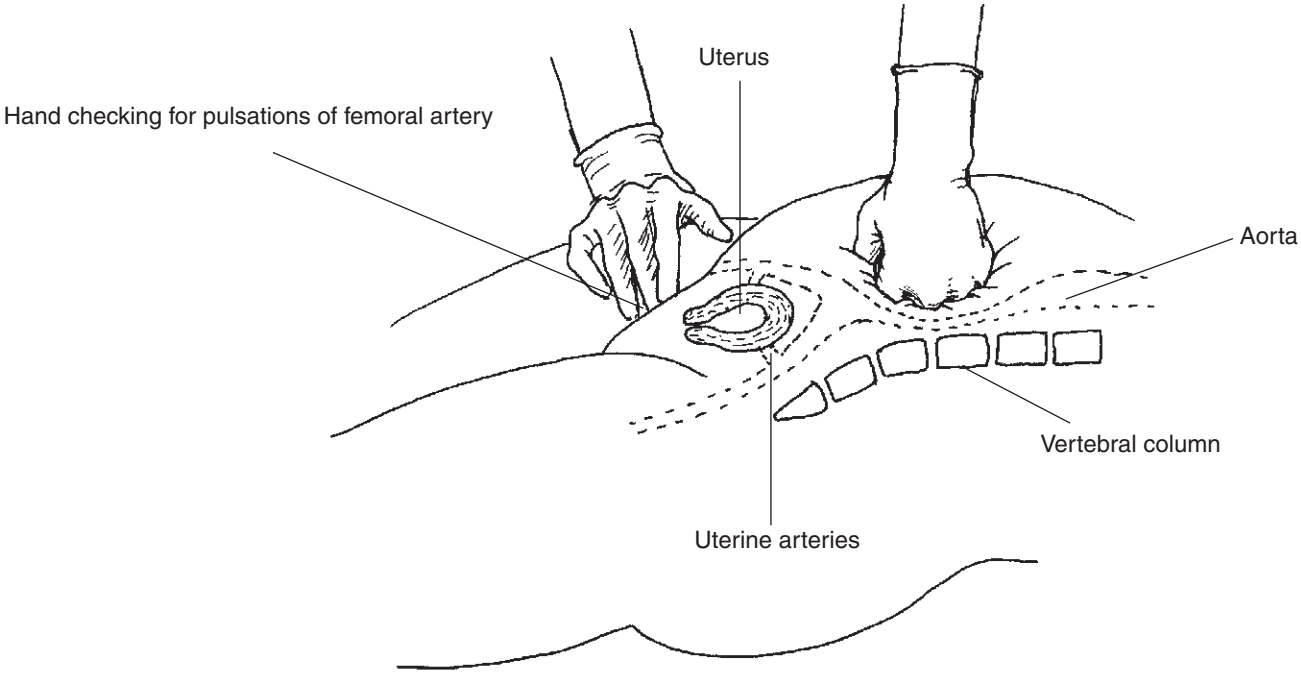


Figure 7.8 Manual compression of the aorta

SKILL: SUTURING PERINEAL TEARS

Teaching method

Topic	Where?	How?
1.	Classroom Clinical area	Modified lecture Demonstration
2. Classification of perineal trauma	Classroom	Modified lecture
3. Choice of suturing materials	Classroom Clinical area	Modified lecture Demonstration
4. Principles of knot tying	Classroom Clinical area	Modified lecture Demonstration
5. Equipment needed	Clinical area	Demonstration
6. Administration of local anaesthesia	Classroom Clinical area	Modified lecture Demonstration
7. Technique of repair	Classroom Clinical area	Modified lecture Demonstration
8. After-care	Clinical area	Demonstration

Teaching content

Remember, this is a woman who is bleeding and who will need immediate attention.

1. General principles:

   - woman in lithotomy position
   - use of a good light
   - good presentation of the anatomy and careful examination of the vagina, perineum and cervix to assess the extent of the trauma (**Figure 7.9**)
   - the importance of speed when there is bleeding
   - aseptic technique (wash and scrub hands, use gloves, correct cleaning technique of the wound from above downwards using each swab once only etc.)
   - gentle handling
   - careful use of swabs so that none are "lost" in the vagina
   - use of local anaesthetic injected early enough to take effect before the start of suturing, i.e. at least 2 minutes
   - explanation and sensitive approach to the woman during the procedure
   - the importance of follow up in order to evaluate technique and selection of suturing materials.

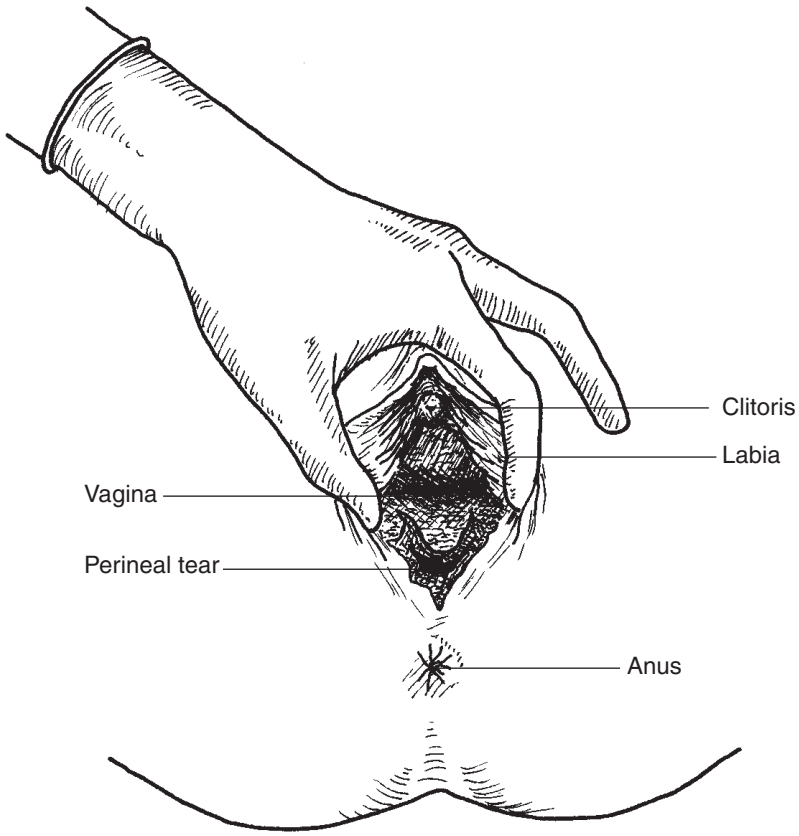


Figure 7.9 Presentation of female anatomy: exposing the perineal tear

2. Classification of perineal trauma:

   - First degree tears (most close spontaneously without sutures)
   - Second degree tears
   - Third degree tears
   - Fourth degree tears.

   (Use **Figures 7.10, 7.11 and 7.12**).

3. Suturing materials.

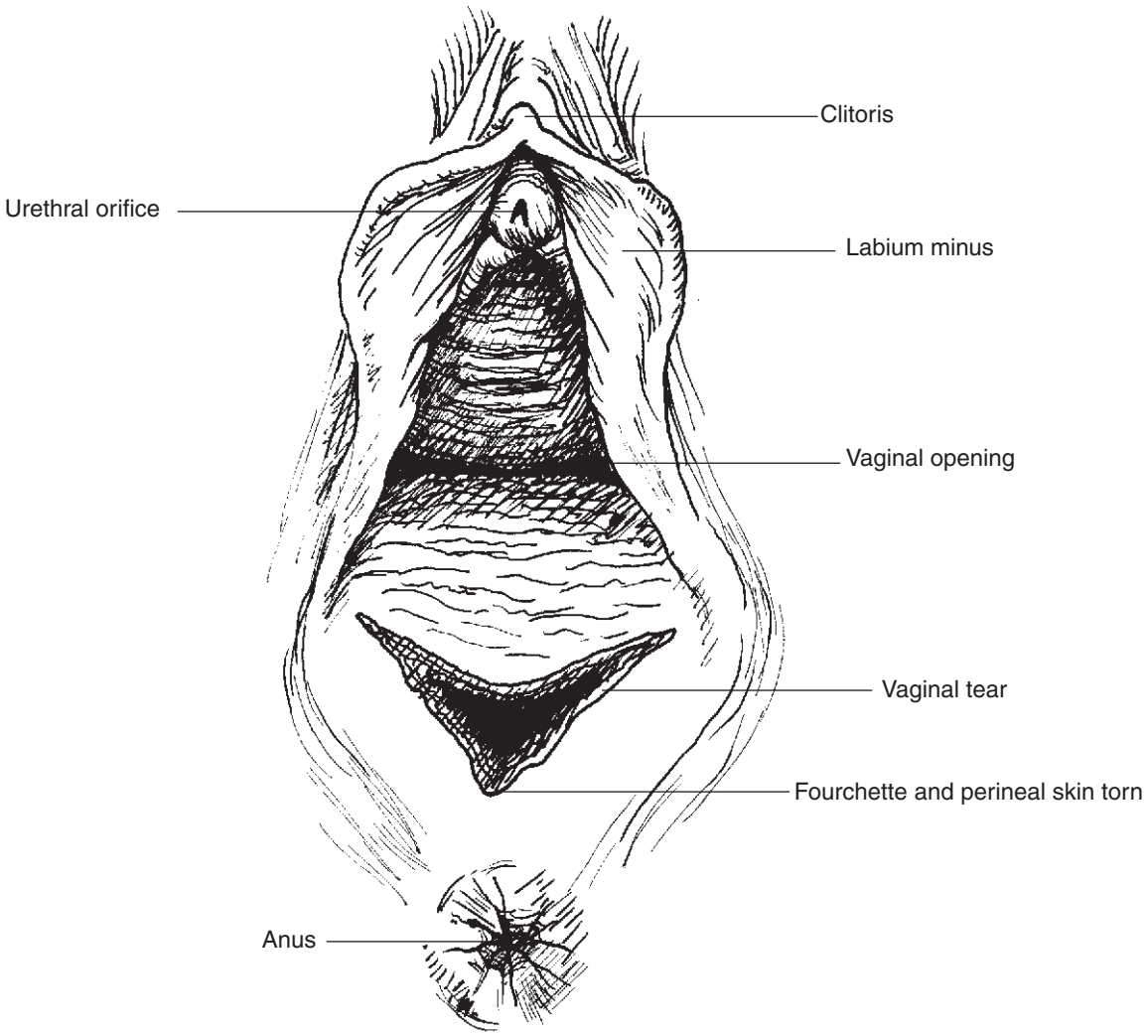


Figure 7.10 First degree tear (involves fourchette only, vaginal and perineal skin torn, muscles intact)

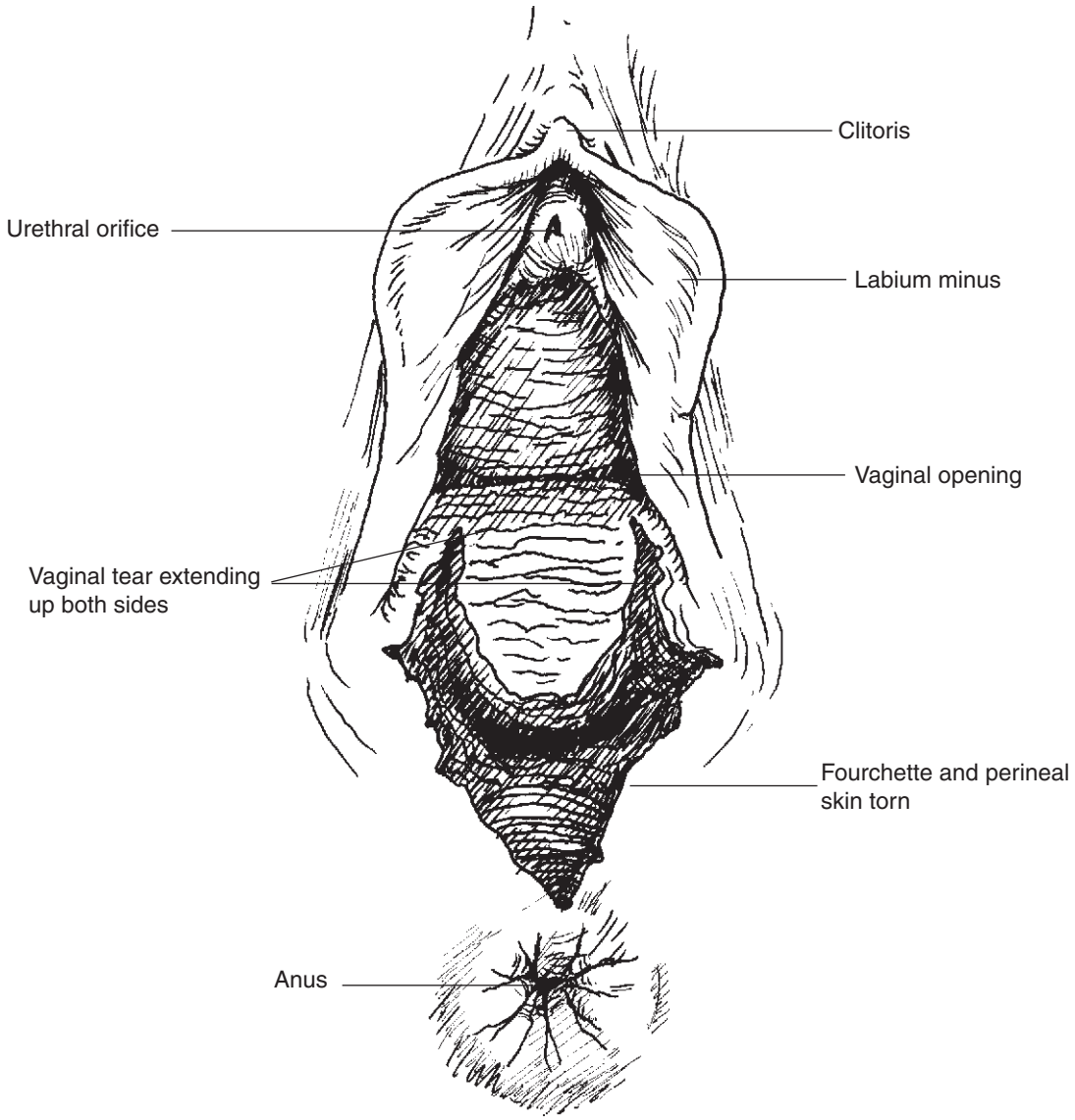


Figure 7.11 **Second degree** tear (involves fourchette and supervicial perineal muscles, vaginal tear often extends up both sides

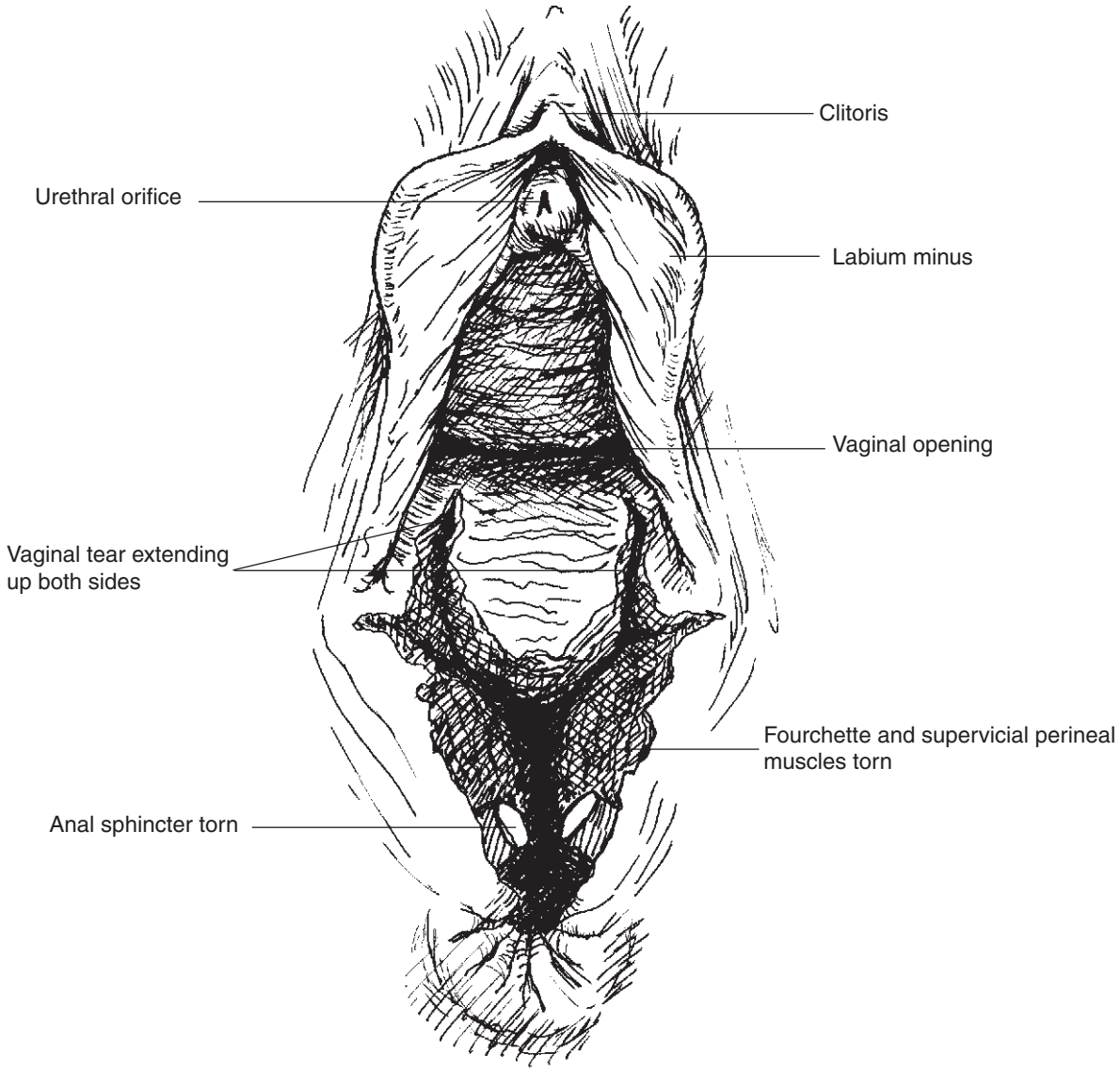


Figure 7.12 Third degree tear (involves fourchette and superficial perineal muscles and anal sphincter); when the damage extends to the rectal mucosa, it is sometimes called a fourth degree tear

Absorbable sutures should be used for closure. Polyglycolic sutures are preferred over chromic catgut for their tensile strength, non-allergic properties, lower probability of infectious complications, less perineal pain in the puerperium and a lower incidence of dyspareunia later. Chromic catgut is an acceptable alternative, but is not ideal.

Sutures come in two types - absorbable and non-absorbable. Absorbable suture which is often called plain catgut is usually made from connective tissue of the small intestine of sheep. It dissolves within a week. However, catgut which is soaked in chromic oxide, resists absorption and retains its strength for 10–40 days. It is often called chromic catgut. Because of its strength and slower rate of dissolving chromic, rather than plain catgut, is the preferred choice if catgut has to be used.

Man-made or synthetic suturing materials which are absorbable include polyglycolic acid sutures such as Vicryl or Dexon. They are completely absorbed in 60 to 90 days, but it is sometimes necessary to cut or remove any tight sutures which are causing irritation or excessive discomfort earlier, usually at about 10 days.

Non-absorbable suture may be made from cotton, silk, plant tissue, metal, or man made fibres. They tend to cause some tissue reaction (like an inflammation with swelling or redness). If no absorbable sutures are available use non-absorbable suture.

Remember, an unrepaired laceration can lead to haemorrhage, anaemia and even death.

Suture material is graded by size - 3/0 means 000. The more zeros in the size the smaller the width of the thread. Therefore, 2/0 or 3/0 is strong and suitable for repairing lacerations of the genital tract, 6/0 is good for repairing wounds on the face, and 9/0 is very good for surgery of the eye.

However, if you are in a situation where polyglycolic, catgut and other suturing materials are not available, use whatever is at hand, e.g. strong cotton thread from a tailor on a regular sewing needle can serve in an emergency. Remember, women can die from heavy blood loss from simple lacerations which are not identified or not repaired.

4. Principles of knot tying*

The knot, when complete, must be firmly tied so that it cannot slip. Therefore, the simplest type of knot is preferred.

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* Some material extracted with kind permission from *Life-saving skills manual for midwives, module 4: episiotomies and repair of lacerations; principles of knot tying. 2nd ed.* American College of Nurse-Midwives, Washington, DC, 1991.

The knot must be as small as possible to prevent reaction of the tissue (e.g. inflammation). The ends of the knot should be clipped to approximately one–half inch in length.

When tying any knot, rubbing between the two strands (sometimes called sawing) should be avoided. This can weaken the suture causing it to break.

Be careful not to damage suture when you are handling it. If you clamp onto it with the needleholder or forceps you can weaken or break the threads.

When pulling tissue together with your suture, be careful not to pull too tightly. This can reduce the circulation to the tissues. Pulling too tightly can also cause the suture to break.

Square knots and surgeon's knots are the best type of knot. They lie flat, take up a minimum of space, and hold together well. Granny knots should never be used for repair of episiotomies or lacerations.

5. Equipment needed

   - antiseptic solution
   - gloves
   - needle holder or toothed clamp
   - 2 sponge forceps
   - suture with needle (see previous page)
   - thumb forceps (tissue forceps)
   - local anaesthetic such as 1% lignocaine
   - 20 cc syringe
   - 1½ inch (or 3 cm) 22 gauge needle is ideal, but use whatever you have
   - gauze.

6. Administration of local anaesthesia:

   - selection of drug (usually lignocaine)
   - amount of drug (20–30 ml)
   - checking of drug (name, strength and dose before administration.

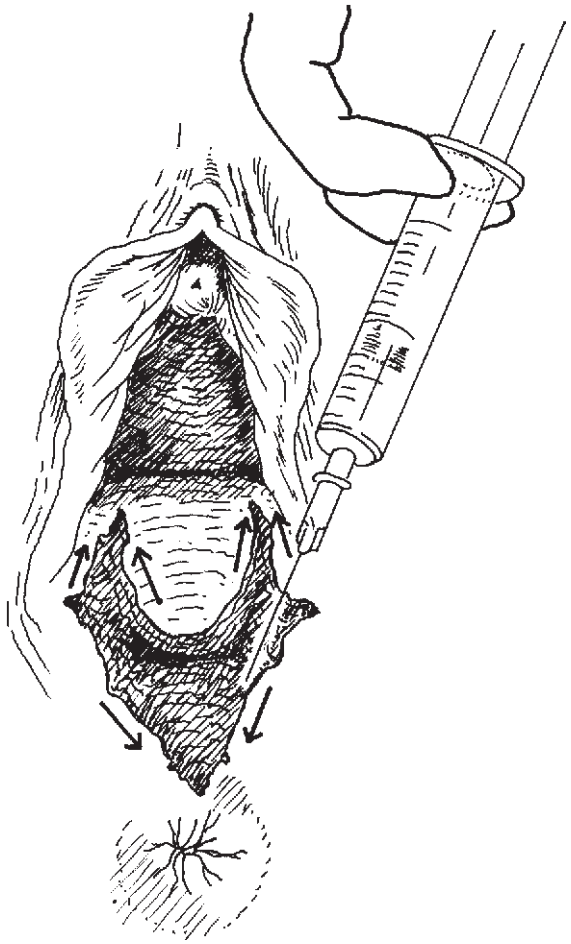

Figure 7.13 Technique of infiltration of local anaesthetic before repair of a tear

- Clean the skin around the area of the tear with an antiseptic solution
- Put a 22 gauge 1½ inch (3 cm) needle on a 20 cc syringe
- Fill the syringe with lignocaine 0.5% or 1%
- Infiltrate local anaesthetic beneath the vaginal mucosa, beneath the skin of the perineum and deeply into the perineal muscle around the tear by inserting the whole length of the needle and injecting as you slowly withdraw the needle (**Figure 7.13**). Before injecting the local anaesthetic, however, pull back on the plunger of the syringe and check for blood each time the needle is reinserted in a new site (if the local anaesthetic is injected directly into a blood vessel it can cause heart irregularity, seizure and death). Approximately 10–30 ml of local anaesthetic is usually required
- A set of injections is required into the vaginal mucosa, beneath the skin and deeply into the perineal muscle on both sides of the tear
- At the conclusion of the set of injections, wait for at least two minutes for the local anaesthetic to take effect. To assess effectiveness of the local anaesthetic, pinch the area with forceps. If the woman feels the pinch, wait for a further two minutes, then re-test.

7. Technique of repair:

   - control bleeding by clamping and ligating bleeding points
   - use swabs to expose the extent of the damage exposing the upper limit of the tear
   - identify any extensive damage which will need expert surgery, (e.g. third or fourth degree tears, vesico-vaginal fistula or presence of necrosed tissue)
   - press the tissue together; the ragged pieces should fit together
   - suture the vagina first, using a continuous 2–0 suture (**Figure 7.14**); start about 1 cm above the apex of the wound and continue the suture 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 perineal tear and tie
   - repair the perineal muscle layer using interrupted 2–0 suture; if the tear is deep place a second layer of stitches to close the space (**Figure 7.15**)
   - finally the perineal skin is sutured with a polglycolic material using interrupted (or subcuticular) sutures, starting at the vaginal opening (**Figure 7.16**)
   - perform a rectal examination to make sure that no stitches are in the rectum; if there are stitches in the rectum, the suturing must be undone and the tear resutured, taking care to avoid stitches in the rectum.

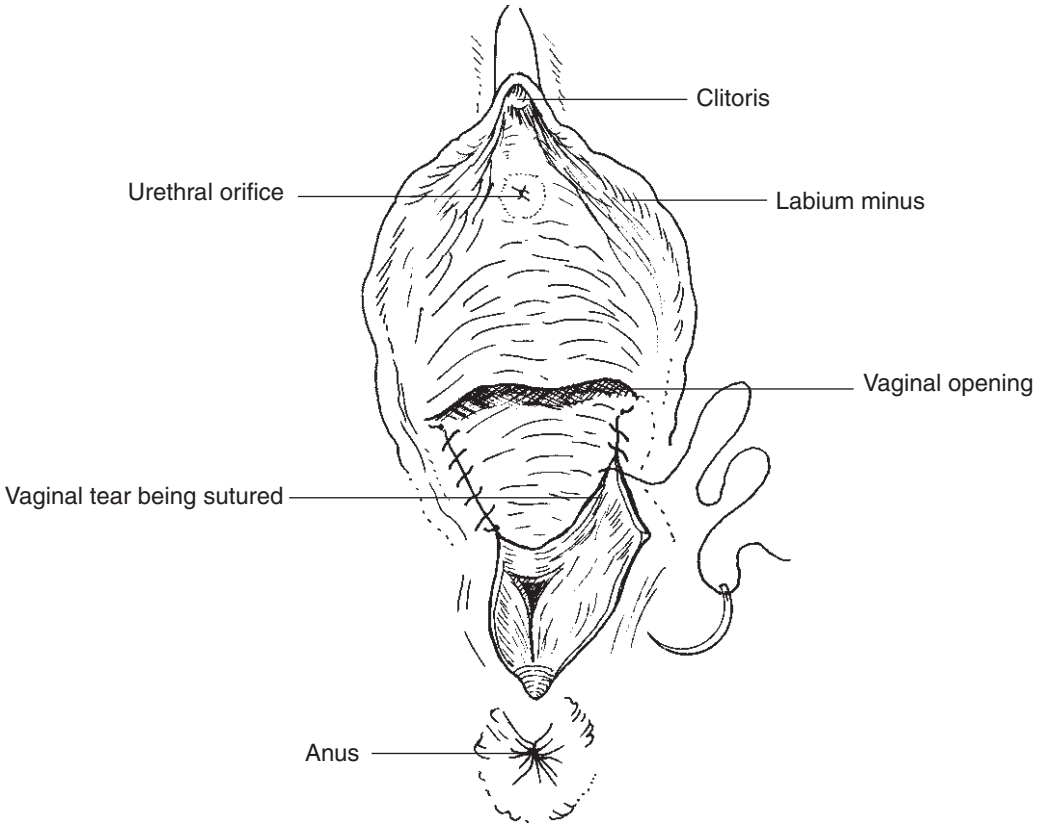

Figure 7.14 Repair of perineal tear (suturing the vaginal tear)

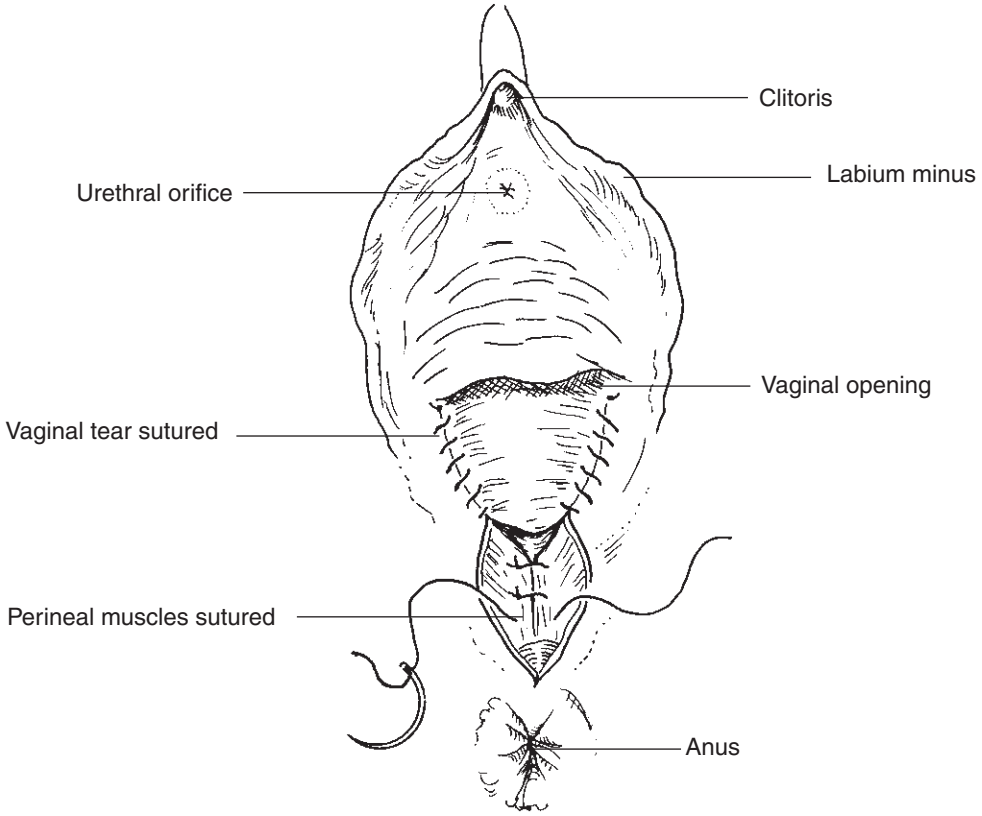

Figure 7.15 Suturing the perineal muscles

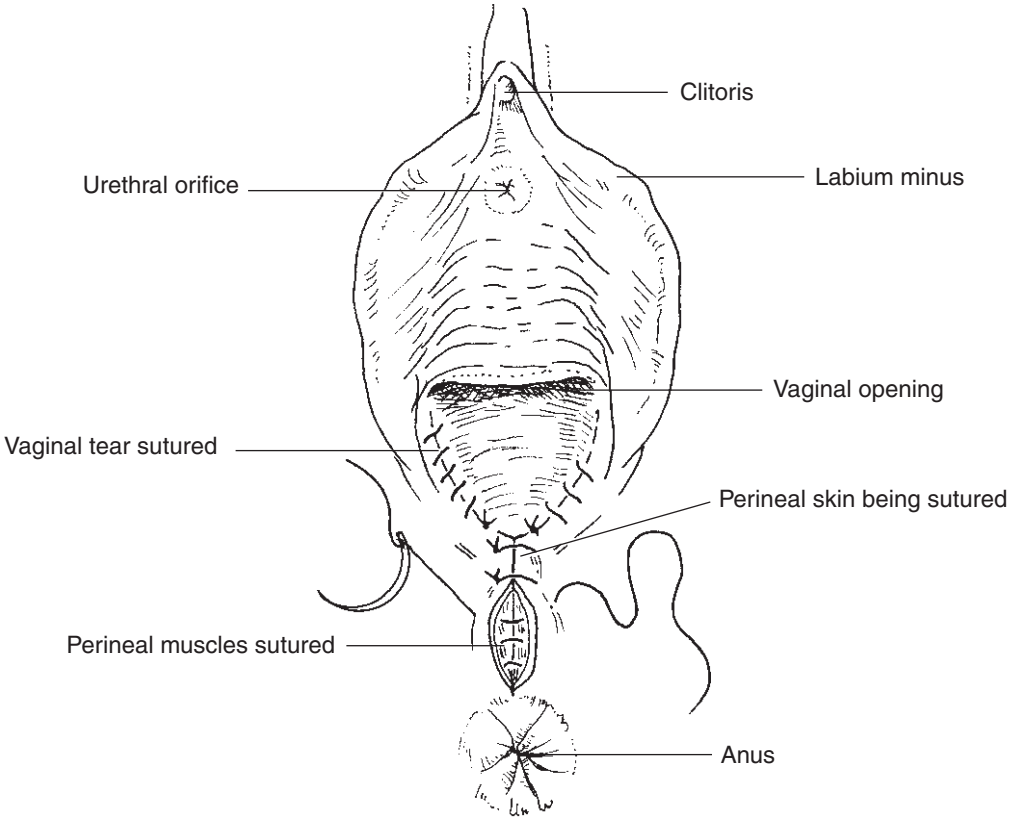

Figure 7.16 Suturing the skin

8. Aftercare:

   Advise the woman to clean the genital area, including the suture line, with clean water twice daily, and always after defecation.

   Examine the sutured perineum for healing and any signs of infection, e.g. marked inflammation, excessive swelling, pus.

   If the wound becomes infected:
   If the infection is mild, antibiotics are not required
   If the infection is severe but does not involve deep tissues, give a combination of antibiotics:
   ampicillin 500 mg by mouth three times per day for five days;
   PLUS metronidazole 400 mg by mouth three times per day for five days
   If the infection is deep, involves muscles and is causing necrosis, give a combination of antibiotics until necrotic tissues has been removed and the woman is fever-free for 48 hours:
   Penicillin G 2 million units IV every six hours;
   PLUS gentamicin 5 mg/kg body weight IV every 24hours;
   PLUS metronidazole 500 mg IV every eight hours;
   Once the woman is fever-free for 48 hours, give:
   ampicillin 500 mg by mouth four times per day for five days
   PLUS metronidazole 400 mg by mouth three times per day for five days.

   Note: It is very important that students are taught and supervized when undertaking suturing by someone already known to be competent in this skill. This may be an experienced midwife or physician with obstetric skills.

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 of the technique? (See general principles on page 129.*

2. *Can the student correctly prepare the necessary equipment?*

3. *Can the student infiltrate the area around the tear effectively with local anaesthetic so as to cause minimum pain?*

4. *Does the student withdraw the syringe to check for blood before injecting local anaesthetic, and know the reason for this safety measure?*

5. *Does the student identify bleeding points quickly and control the bleeding?*

6. *Does the student maintain aseptic technique?*

7. *Does the student identify the extent of the damage and decide appropriately whether she/he should complete the repair or arrange referral for further surgery?*

8. *Does the student select appropriate suturing material?*

9. *Is the student gentle when handling the woman and sensitive in approach?*

10. *Does the student suture the tear correctly in layers, using appropriate suturing methods for each layer?*

11. *Does the student prescribe/arrange for prescription and administer a broad spectrum antibiotic if the sutured perineum becomes infected?*

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 7.17)***
- *median* ***(Figure 7.18).***

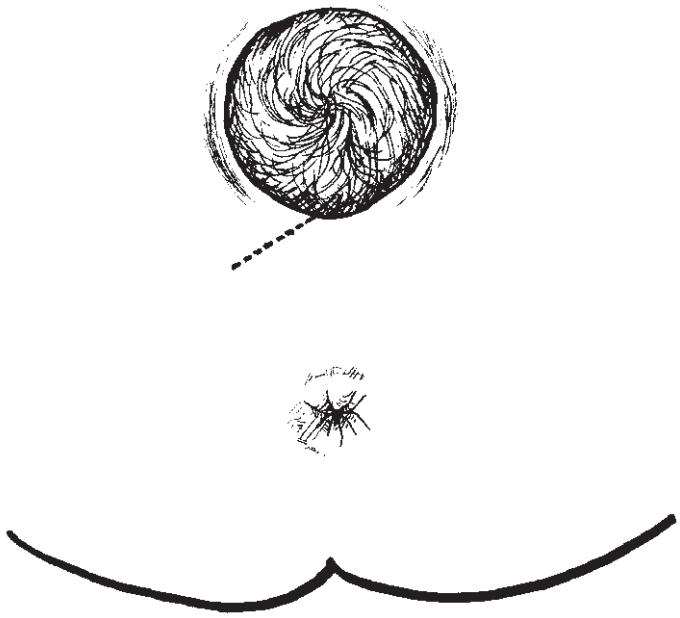

Figure 7.17 Mediolateral episiotomy

* 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, 1991:3–5.

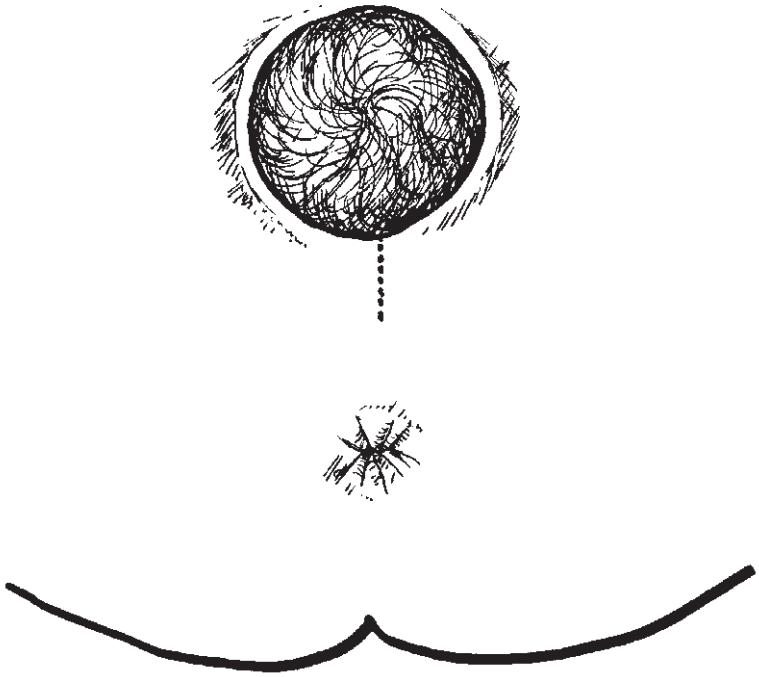

Figure 7.18 Median episiotomy

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

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 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 not be 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 anaesthesic:

- 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 7.19**). 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

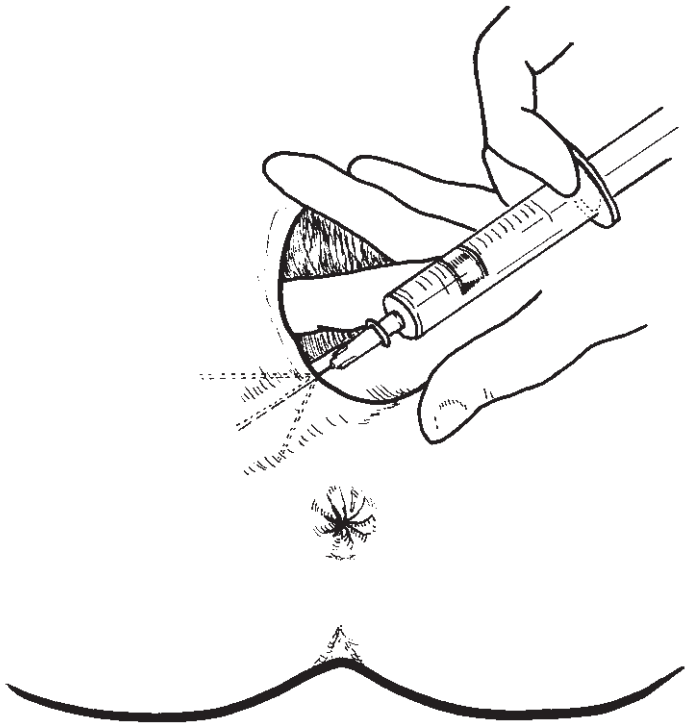

Figure 7.19 Infiltrating tissues with local anaesthetic

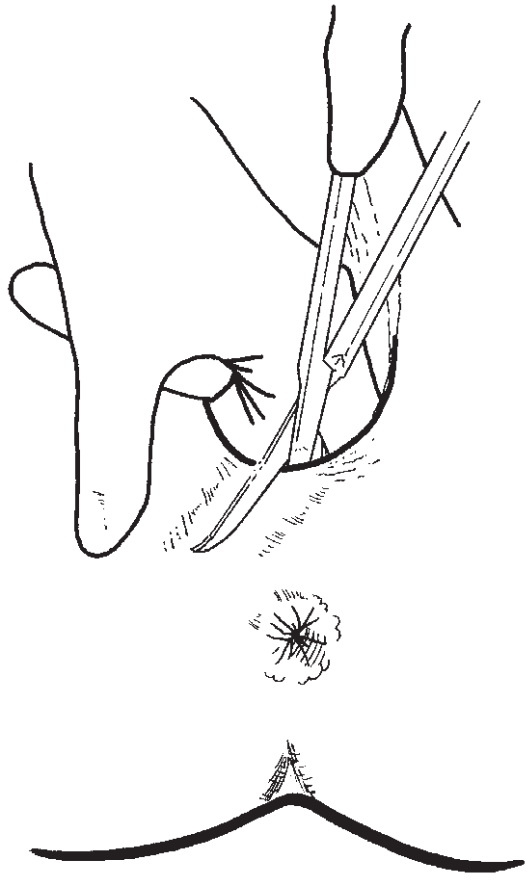

Figure 7.20 Making the incision, while inserting two fingers to protect the baby's head

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 7.20**).

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 7.21**).

- 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 7.22** and **Figure 7.23**).

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 aftercare?*

Note:

(a) Episiotomy should never be performed only for practise purposes.

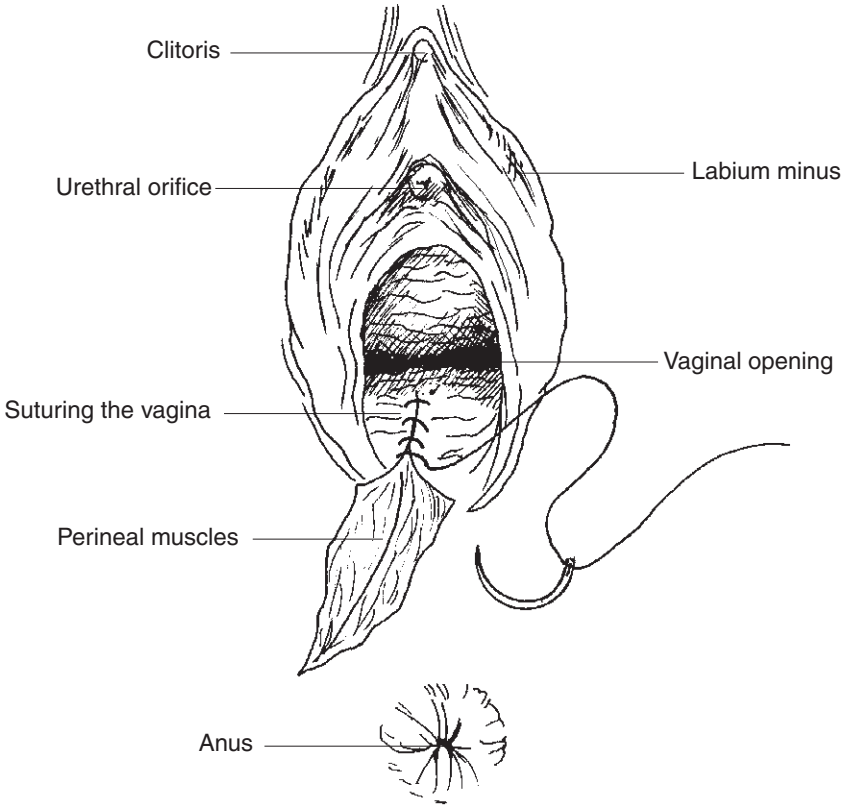

Figure 7.21 Repair of mediolateral episiotomy (suturing the vagina)

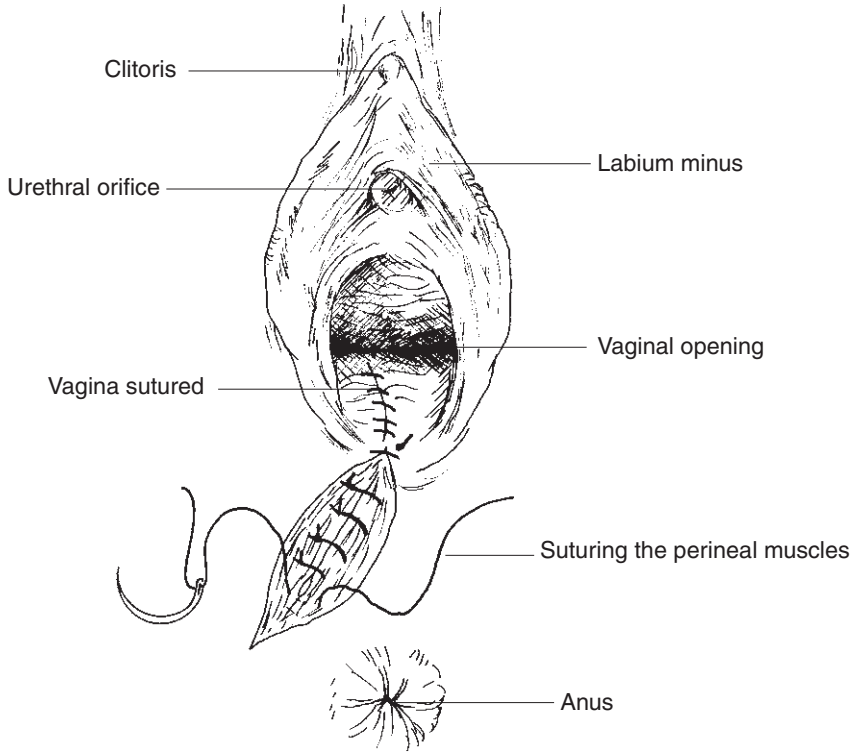

Figure 7.22 Repair of mediolateral episiotomy (suturing the perineal muscles)

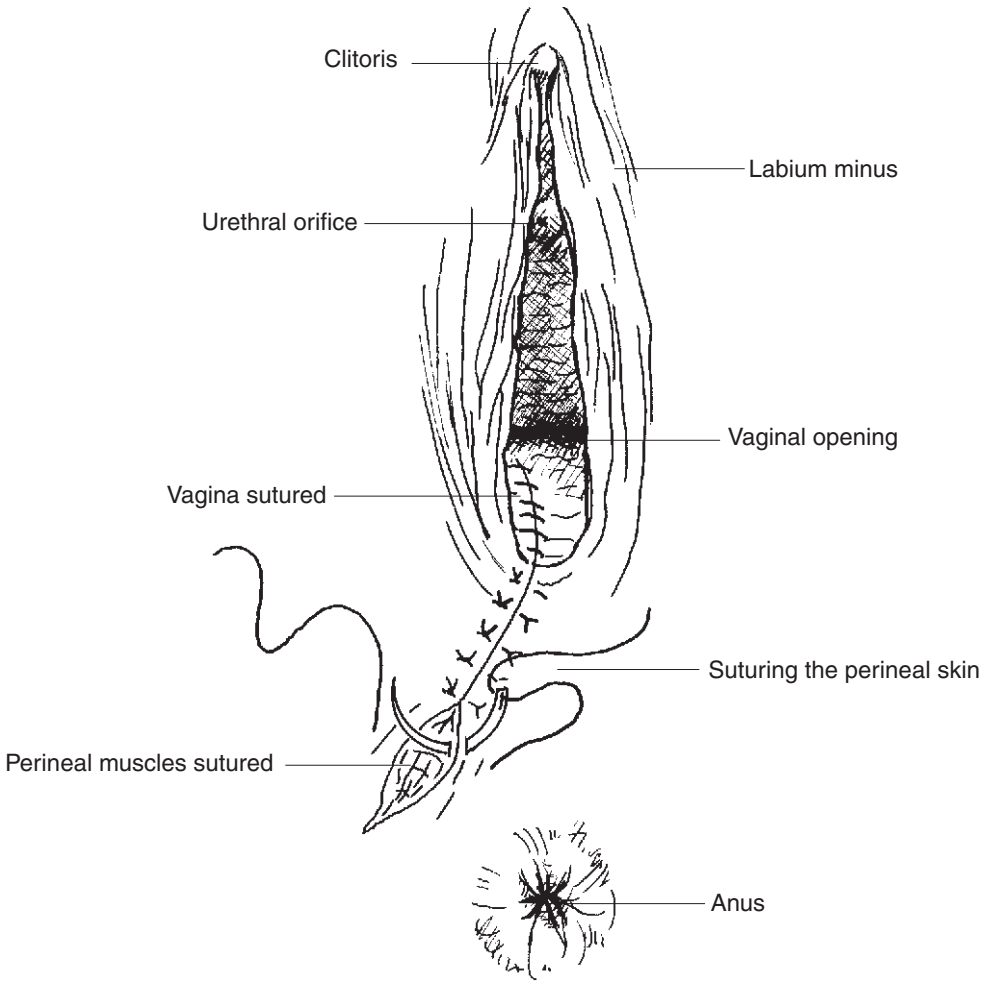

Figure 7.23 Repair of mediolateral episiotomy (suturing the skin)

(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.

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

Giving antibiotics

It is important to note some general facts.

1. Infection during pregnancy and the postpartum period may be caused by a combination of organisms.

2. Give a combination of antibiotics to cover both aerobic and anaerobic cocci and bacilli.

3. IV administration of antibiotics is preferred for very serious infections because it helps to speed delivery of the drug to the affected tissues.

4. If oral administration is prescribed for women to take at home, it is important to stress to the woman that she must complete the whole course of tablets, even if she feels better before taking them all.

Prescribing drugs

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

1. If midwives are practicing 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 does given:
   - Signatures: 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.

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. An 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 woman 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 of not using them beyond that date?*

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

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?*

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 share 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 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 postpartum woman.

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 and consider the question "What is the purpose of record keeping?"

Purposes of record keeping

Write down the purpose on the blackboard as the students give the information.

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 simple 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 REPAIR OF CERVICAL AND HIGH VAGINAL TEARS

SESSION 8
REPAIR OF CERVICAL AND HIGH VAGINAL TEARS

Aims

- To enable students to acquire the necessary skills in order to undertake suturing of the cervix and repair of high vaginal tears.
- It is assumed that students studying Session 8 will have achieved the objectives from Session 1 to Session 7 of this module.

Objectives

On completion of Session 8, students will be able to:

- Describe the nature and causes of cervical and high vaginal tears.
- Demonstrate the procedure for cervical and vaginal inspection.
- Describe the preparation of the woman for repair of cervical and high vaginal tears and the equipment and supplies required.
- Demonstrate the procedure for the repair of cervical and high vaginal tears.
- Describe the management and care following repair to cervical and high vaginal tears.

Plan

Modified lecture, discussion, demonstration (1 hour)
Clinical teaching and supervision (variable, depending on the ability and need of students).

Timing

The theoretical session will need at least one hour. However, the clinical component which is the most important will take much longer, and, should be based on each student's need for clinical teaching and supervision as well as assessment.

The time will also vary according to the:

- availability of relevant clinical cases - strict control must ensure that for teaching purposes, only the cases where there is a clinical indication for repair of cervical and high vaginal tears must be used.
- availability of teachers experienced in these skills - midwifery teachers may wish to work collaboratively with an obstetrician when teaching repair of cervical and high vaginal tears.

Resources

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

INTRODUCTION

When teaching the skills in this session, midwifery teachers may wish to collaborate with other teachers and/or clinicians who are competent in the skills (e.g. practicing midwives, obstetricians).

The skills should first be demonstrated by the teacher or by a competent clinician. Simulated practice should then take place 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 and an appropriate model to practise suturing cervical and vaginal tears. Finally, where possible, (i.e. opportunities for students to have hands-on practice in these skills may be very limited), clinical practice should take place under direct supervision and feedback to enable students to develop competence in those skills.

Remind students that the infection prevention practices described with respect to managing primary and secondary PPH (Session 6) apply to the skills in this session.

Unrepaired cervical or vaginal lacerations can lead to heavy blood loss, scarring, infection, painful sexual intercourse and death. It is therefore important that midwifery personnel know how to suture them.

Cervical tears usually occur laterally, either on one side or on both sides. A high cervical tear may extend to the lower uterine segment resulting in incomplete rupture of the uterus. A cervical tear may involve branches of the uterine artery to the cervix causing extensive bleeding.

When the tear occurs in the upper two–thirds of the vagina, it is called a high vaginal tear. Vaginal tears in the upper third of the vagina are usually associated with tears of the cervix. Sometimes the surface layer of the vagina is intact but there is a large haematoma (collection of blood) in the vaginal wall due to rupture of the veins in the vagina.

Cervical and high vaginal tears may be due to:

- prolonged/obstructed labour: when the cervix is caught between the head of the baby and the symphysis pubis, the anterior lip may become swollen, does not stretch well, and is likely to tear
- delivery by forceps, vacuum extraction or breech extraction before the cervix is fully dilated
- precipitate labour (spontaneous or stimulated, by giving oxytocic)
- failure of the cervix to dilate because of congenital abnormality or scarring due to previous injury.

CERVICAL AND VAGINAL INSPECTION

The cervix and vagina should be examined routinely, even if there is no bleeding, especially after instrumental deliveries, prolonged/obstructed labour and precipitate labour. Cervical and vaginal tears are diagnosed by careful vaginal examination, under good light.

- After washing your hands and putting on sterile gloves, separate the woman's labia (vaginal lips) with one hand
- Have an assistant shine a light into her vagina and look carefully for any tears or haematoma
- Press firmly on the back wall of the vagina with the fingers of the other hand and look deeply into the vagina. Bleeding from a vaginal or cervical laceration may be detected by a slow but continuous bleeding, or by spurts from a pumping artery
- Slowly pressing against the vaginal wall, move your fingers all the way up the side of the wall of the vagina to the cervix checking for bleeding points or a haematoma. Repeat on the other side of the vagina
- Next, ask an assistant to press firmly down on the woman's uterus. This will move the cervix lower in the vagina so that you can examine it more easily
- Insert two specula, one posteriorly and the other anteriorly and ask your assistant to hold them (if you are alone, a posterior weighted speculum such as the one in **Figure 8.1** could be used to push down the back wall of the vagina). If no specula are available, press firmly on the back wall of the vagina with one hand to expose the cervix better. With the other hand take a sponge forceps and clamp it on the anterior lip (top lip) at 12 o'clock.* Clamp another sponge forceps on the cervix at 3 o'clock and examine the portion of the cervix between the forceps (**Figure 8.2**). Check for slow continuous bleeding or spurts of blood. Unclamp the 12 o'clock forceps, and reclamp it at 6 o'clock. Now examine the portion of cervix lying between 3 o'clock and 6 o'clock (**Figure 8.3**). Unclamp the 3 o'clock forceps and reclamp it at 9 o'clock. Continue this procedure clockwise, until you have examined the whole cervix. Lacerations occur most frequently on the sides of the cervix (laterally) at 3 or 9 o'clock. If there is blood in the way and it is difficult to see where the bleeding is coming from, take a sterile gauze or cloth and wipe the blood away.

It is necessary to repair the tear if it is a large one and it bleeds persistently. It is not necessary to repair a small laceration that does not bleed. Slight tears of the cervix occur in most labours - these heal quickly on their own. In healing, they change the appearance of the cervix from a smooth circular opening into a transverse slit (**Figure 8.4**). If a cervical tear extends into the uterus, a laparotomy is required to repair the tear.

* Explain to students that for the purpose of easy reference, they should imagine that the cervix is a clock.

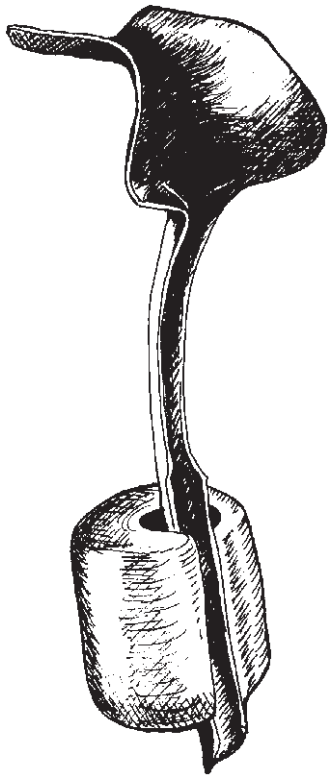

Figure 8.1 Posterior weighted speculum

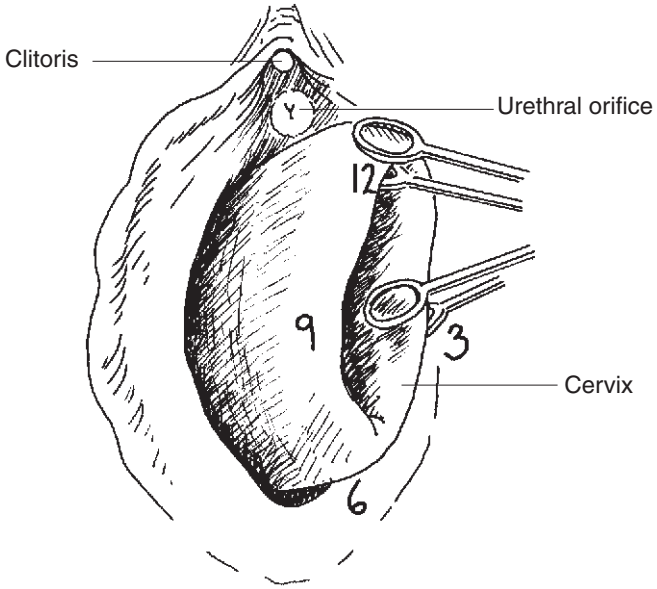

Figure 8.2 Inspecting the cervix for tears between 12 o'clock and 3 o'clock

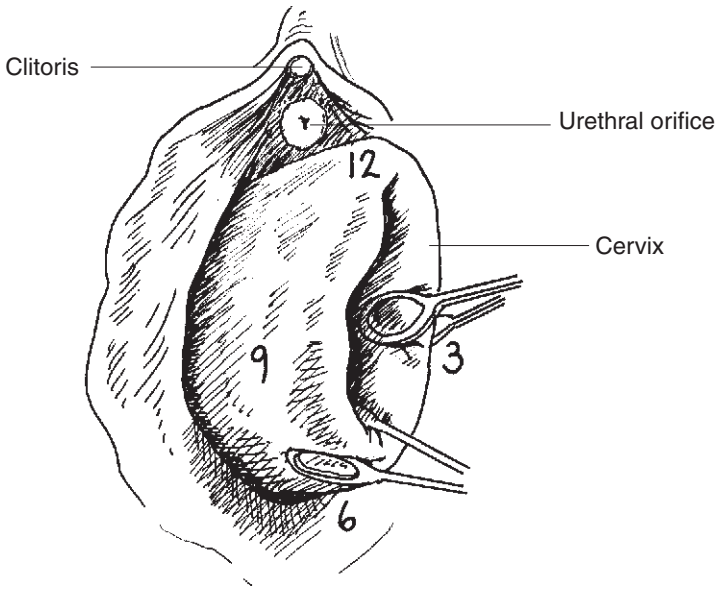

Figure 8.3 Inspecting the cervix for tears between 3 o'clock and 6 o'clock

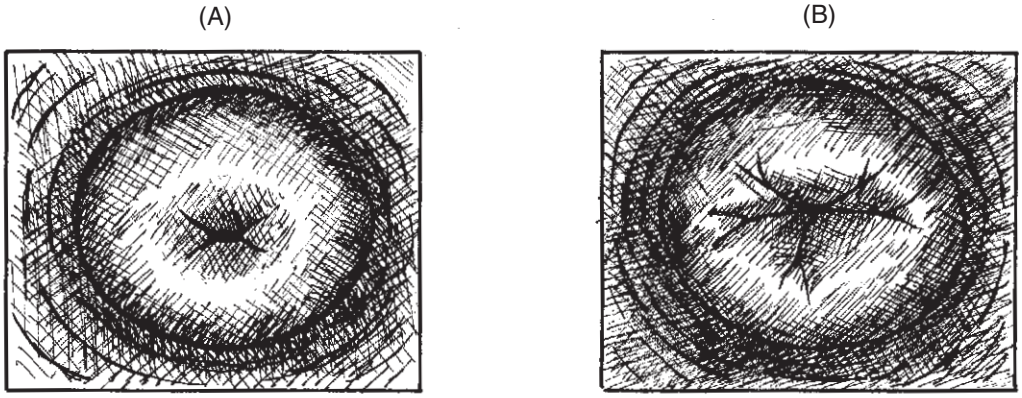

Figure 8.4 Appearance of cervix in a nullipara (A) and a multipara (B)

REPAIR OF HIGH VAGINAL TEAR AND CERVICAL TEAR

Preparation of patient

- Assess the general condition of the patient, check her vital signs and estimate the amount of blood loss. Check that the uterus is firm and well contracted. Ask the woman to void urine if she can
- Explain the intervention to the woman, and reassure her
- Take blood for typing, cross matching and haemoglobin level if it has not already been done
- Start an IV drip either Ringer's lactate or normal saline and run it fast if hypovolaemia has not yet been corrected. A blood transfusion may be required if blood loss has been heavy

Equipment and supplies required

- A good light source
- Antiseptic solution
- Sterile gloves
- 2/0 suturing material and needle
- Needle holder
- Two sponge forceps
- Local anaesthetic (such as 0.5% or 1% lignocaine), syringe and needle
- Sterile gauze
- Specula (anterior and posterior).

For tears that are high and extensive, give pethidine and diazepam IV slowly. (Do not mix in same syringe).

Procedure for repair of cervical tear

1. Help the woman lie on her back with knees bent.

2. Clean the perineum, vulva, vagina with an antiseptic solution.

3. Scrub hands and put on sterile gloves, if available. If sterile gloves are not available, use clean gloves.

4. Catheterize the bladder if it is full and the woman was unable to void urine on her own.

5. Ask an assistant to massage the uterus and provide fundal pressure.

6. Gently grasp the cervix with sponge or ring forceps. Apply the forceps on both sides of the tear and gently pull in various directions to see the entire cervix. There may be several tears. (**Warning**: If you use a toothed forceps or clamp, this can cut the cervix and cause greater bleeding, or you might accidentally pull off a piece of cervix).

7. Start suturing from the apex (top) of the tear, using continuous polyglycolic suturing material or, if this is not available, chromic catgut (**Figure 8.5** and **Figure 8.6**).

8. If a long section of the rim of the cervix is tattered, under-run it with a continuous suture.

9. If you find difficulty in reaching the apex, it may be possible to grasp it with artery or ring forceps. Leave the forceps in place for 4 hours. Do not persist in attempts to ligate the bleeding points as such attempts may increase the bleeding.

10. After 4 hours, open the forceps partially but do not remove. After another 4 hours, remove the forceps completely.

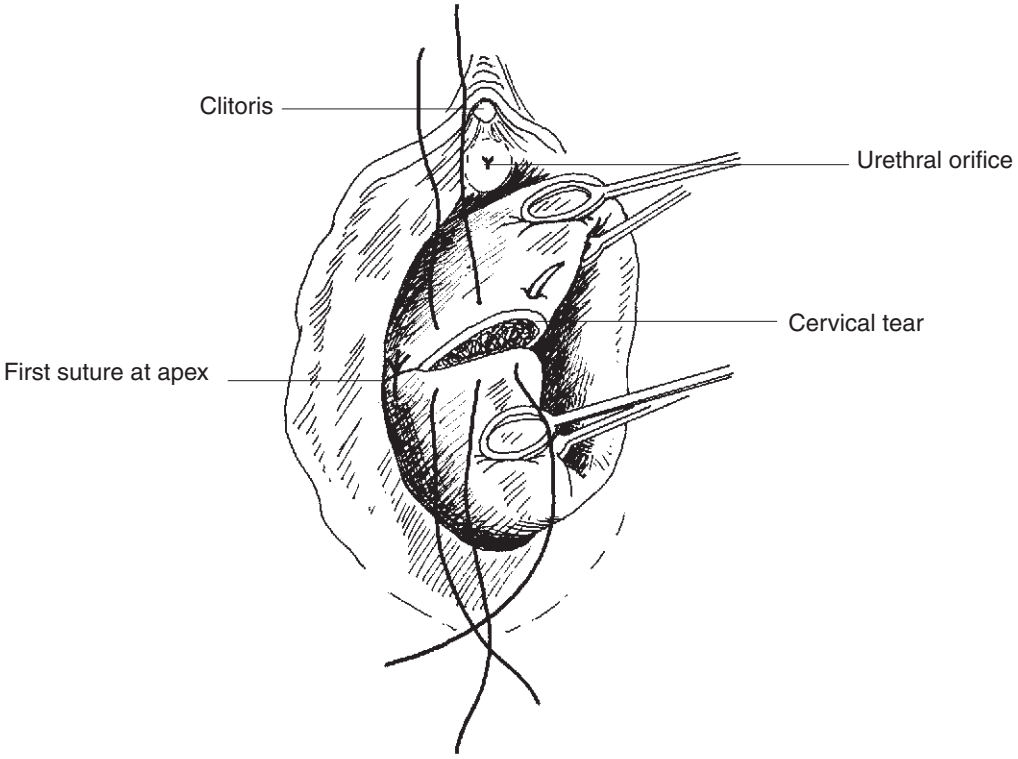

Figure 8.5 Holding the cervix steady with forceps for laceration repair

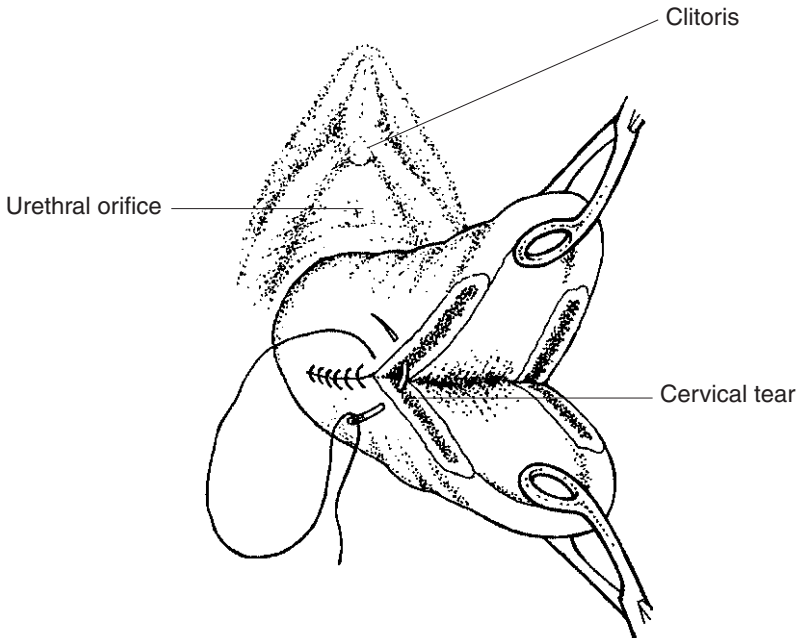

Figure 8.6 Uninterrupted sutures on the cervix

Procedure for repair of high vaginal tear

A laparotomy may be required to repair a cervical tear that has extended deep beyond the vaginal vault.

1. Start similarly as for a cervical tear (1, 2, 3).
2. Expose the tear in the vagina.
3. After infiltrating a local anaesthetic, suture the tear with continuous suture. Suture the torn deep tissue, not only the vaginal lining, as tears of the vagina are often accompanied by injury to the underlying tissue. If the tear is in the upper third of the vagina, be aware that the urether lies 1.5 cm above the lateral vaginal fornix (**Figure 8.7**). Avoid a deep bite with the needle at this site.
4. Apply a sterile pad to the perineum.

Bleeding from a cervical or vaginal laceration may be profuse and the woman may die, so speed is essential.

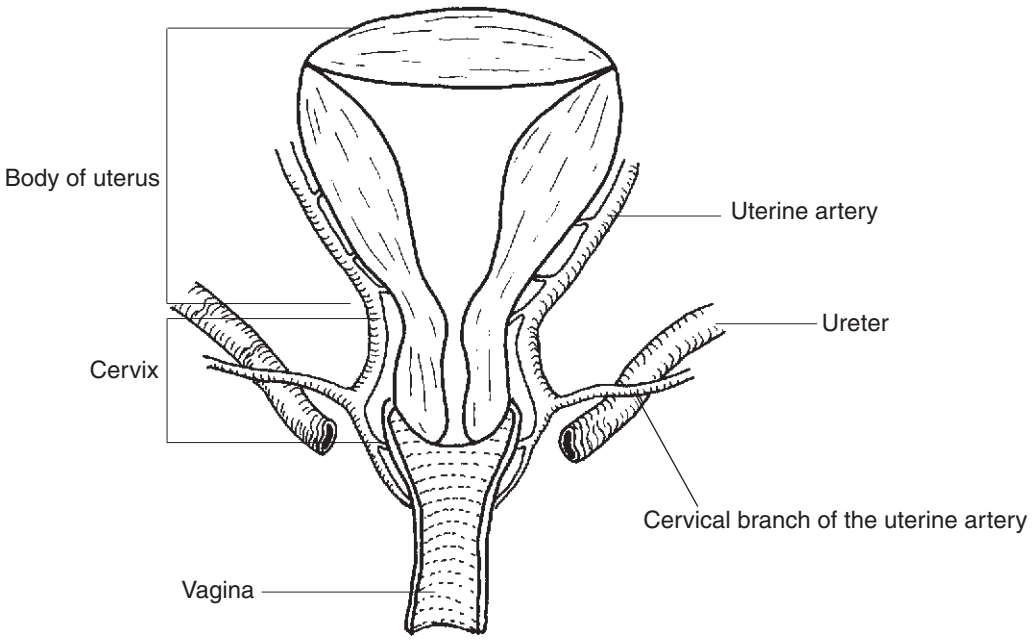

Figure 8.7 Relation of blood vessels and ureter to cervix and vagina

Aftercare

- Check the woman's vital signs regularly
- Watch for bleeding and/or development of haematoma
- Give IV fluid and/or blood according to the woman's condition
- Teach the woman to wash her genitalia at least twice a day, always after defecation and also to change vaginal pad frequently
- Follow-up the woman in 10 days, and again in 6 weeks to check that the wound is healing properly.

Complications and their management

Early complications

1. *Bleeding*
   It may occur if the blood vessels have not been ligated properly. Prevent this by carefully ligating the bleeding points while suturing. Make sure that the bleeding is not coming from an atonic uterus.

2. *Haematoma*
   This is a collection of blood in the vaginal wall that commonly occurs as a complication of vaginal injury. It may be present with vaginal or vulval swelling or intense pain and retention of urine. Prevent it by carefully ligating the bleeding points while suturing. If the haematoma is large and painful, it should be incised and drained under general anaesthesia. The bleeding points should be ligated and deep interrupted sutures applied to close the cavity.

3. *Retention of urine*
   The woman should be encouraged to void frequently. If she is unable to void urine on her own, an indwelling catheter may have to be inserted to avoid straining.

4. *Infection*
   This is a common complication and may be avoided by using an aseptic technique to repair the tear. If the wound becomes infected, the sutures may have to be removed and the wound resutured, if needed, after the infection has cleared.

Late complications

1. Scarring and vaginal stenosis (narrowing) may occur in neglected tears of the vagina and may cause pain during intercourse and obstructed labour in subsequent deliveries.

2. Cervical scarring due to an unrepaired cervical tear may lead to prolonged labour in subsequent pregnancies because the cervix may not dilate properly.

3. Vesico-vaginal, vesico-cervical or recto-vaginal fistulae can occur if vaginal or cervical tears extend into the bladder or rectum.

Assessing competence

The following checklist should be used during direct observation of the student performing repair of a cervical or high vaginal tear, 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 practice. The teacher must then use the checklist again to observe and assess the student's competence.

Clinical skills checklist for repair of high vaginal tears ✓			
Step	**Yes**	**No**	**Remarks**
Instruments and supplies: ▪ prepares instruments, room and supplies			
Patient preparation: ▪ provides reassurance and emotional support to the woman ▪ takes blood for Hb, typing and cross-matching ▪ starts IV drip of either sodium lactate or normal saline ▪ if shock is severe, gives plasma expanders or blood (when safe blood is available) ▪ checks that uterus is firm and well contracted ▪ asks the woman to empty her bladder ▪ explains the procedure to the woman ▪ cleans around the vagina and perineal area with an antiseptic solution			
Steps in the procedure: ▪ scrubs hands and puts on sterile gloves ▪ exposes the tear in the vagina ▪ infiltrates local anaesthetic in the area of the tear ▪ sutures the tear with continuous or interrupted sutures ▪ applies a sterile pad to the perineum ▪ provides emotional support to the woman throughout, using good interpersonal communication skills ▪ makes the woman comfortable ▪ completes all records			
Immediate post-procedural care: ▪ monitors the woman's vital signs immediately following the procedure, then 2 to 4 hourly ▪ checks for vaginal bleeding/haematoma formation ▪ replaces fluids intravenously and starts blood transfusion, if necessary ▪ starts the woman on a broad spectrum antibiotic (e.g. ampicillin 1 g stat and 500 mg every 6 hours for 5 days) ▪ gives an analgaesic (e.g. paracetamol) for pain, if requested ▪ ensures the woman is comfortable and is under constant supervision, or has ready means to call for assistance if she feels she is bleeding ▪ makes a referral to high-level care if required ▪ completes all records			

Teachers comments:

Student's comments:

Clinical skills checklist for repair of cervical tears ✓			
Step	**Yes**	**No**	**Remarks**
Instruments and supplies: ▪ prepares instruments, room and supplies			
Patient preparation: ▪ provides reassurance to the woman and explains cause of bleeding ▪ takes blood for Hb, typing and cross-matching ▪ starts IV drip of either sodium lactate or normal saline ▪ if shock is severe, gives plasma expanders or blood (when safe blood is available) ▪ checks that uterus is firm and well contracted ▪ asks the woman to empty her bladder ▪ explains the procedure to the woman ▪ cleans around the vagina and perineal area with an antiseptic solution			
Steps in the procedure: ▪ scrubs hands and puts on sterile gloves ▪ catheterizes the woman, if she is unable to void urine ▪ visualizes the cervix ▪ places a sponge forceps on each side of the laceration ▪ places the handles of both forceps in one hand and gently pulls toward self ▪ starts suturing from the top of the tear ▪ applies uninterrupted sutures the length of the wound, approximately 1 cm apart, taking the whole thickness of each lip of the cervix ▪ applies a sterile pad to the perineum ▪ provides emotional support throughout using good interpersonal communication skills			
Immediate post-procedural care: ▪ monitors the woman's vital signs immediately following the procedure, then 2 to 4 hourly ▪ checks for vaginal bleeding/haematoma formation ▪ replaces fluids intravenously and starts blood transfusion, if necessary ▪ starts the woman on a broad spectrum antibiotic (e.g. ampicillin 1 g stat and 500 mg every 6 hours for 5 days) ▪ gives an analgaesic (e.g. paracetamol) for pain, if necessary ▪ ensures the woman is comfortable and under constant supervision, or has ready means to call for assistance if she feels extreme pain or thinks she is bleeding ▪ makes a referral to higher-level care if required ▪ completes all required records			

Teacher's comments:

Student's comments:

9 MANUAL REMOVAL OF PLACENTA

SESSION 9
MANUAL REMOVAL OF PLACENTA

Aims

To enable students to acquire the necessary skills in order to undertake manual removal of the placenta. It is assumed that students studying this session will have achieved the objectives from Session 1 and Session 3 of this module and will be able to:

- Explain the physiology of the third stage of labour with reference to significant anatomy (Session 1).
- Describe how the midwife's understanding of third stage physiology and the management of this stage can influence the outcome (Session 1).
- Undertake active and physiological management of the third stage of labour under supervision (Session 1).
- List the causes of and risk factors for postpartum haemorrhage and identify the avoidable factors (Session 3).
- Discuss the steps to be taken in order to prevent death from the avoidable factors identified (Session 3).

In addition students will have achieved the objectives in all of the other sessions in this module.

Objectives

On completion of Session 9, students will be able to:

- Describe the preparation of the woman for manual removal of the placenta and the equipment and supplies which are required.
- Demonstrate the procedure for manual removal of the placenta.
- Describe the management and care of a woman following manual removal of the placenta.
- Explain the dangers associated with retained placenta and manual removal.

Plan

- Modified lecture, discussion and demonstration, clinical teaching and supervision (3 hours).

Timing

The theoretical session will need at least one hour. However the clinical component, which is the most important, will take much longer and should be based on each student's need for clinical teaching and supervision, as well as assessment.

The time will also vary according to the:

- availability of relevant clinical cases - strict control must ensure that for teaching purposes, only the cases where there is a clinical indication for manual removal must be used.
- availability of teachers experienced in this skill - midwifery teachers may wish to work collaboratively with an obstetrician or senior midwife when teaching manual removal of placenta.

Resources

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

INTRODUCTION

When teaching the skills in this session, midwifery teachers may wish to collaborate with other teachers and/or clinicians who are competent in the skills (e.g. practicing midwives, obstetricians)

The skills should first be demonstrated by the teacher or by a competent clinician. Simulated practice should then take place to provide students with an opportunity to become familiar with the sequence of steps in the procedure. This could be done in the classroom using a pelvic model and an appropriate model of the placenta. Finally, where possible, (i.e. opportunities for students to have hands-on practice in this skill may be very limited), 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 primary and secondary PPH (Session 6) apply to the skills required in this session.

It is critical for midwives, as well as other skilled health workers who provide care at birth, to be skilled in the manual removal of the placenta.

Ask the students: Why is this important?

They should understand that:

- *The longer the placenta is retained the greater the risks due to:*
  - *shock*
  - *haemorrhage*
  - *infection.*

For this reason:

- *If there is bleeding caused by a retained placenta, manual removal of the placenta should be carried out without delay.*

Students should know the following with regard to manual removal of the placenta:

Indication: To stop or prevent postpartum haemorrhage.

Before learning to perform manual removal the practitioner must be able to:

- *manage labour (first, second and third stages), including*
- *pelvic examination,* ***and***
- *setting up an intravenous infusion.*

Explain that you will now be teaching the skill for manual removal of placenta in theory and practice. Remind students of the importance of being able to identify priorities as they carry out this management (i.e. doing the most important things first).

MANUAL REMOVAL OF THE PLACENTA

Preparation of patient

- Explain the intervention to the woman and reassure her
- Take blood for typing and cross-matching and for haemoglobin level if it has not already been done
- Start IV infusion, if not already established, and infuse either Ringer's lactate or normal saline. Run it fast if hypovolaemia has not yet been corrected. Blood transfusion may be needed if haemorrhage is severe.
- Give one dose of prophylactic antibiotics:
  - ampicillin 2 g IV, **and**
  - metronidazole 500 mg IV, **or**
  - cefazolin 1 g IV, plus metronidazole 500 mg IV.

Equipment and supplies needed:

- antiseptic solution
- sterile gloves
- one long sterile glove
- sterile swabs
- sterile vulval pad
- clamp, e.g. sponge-holding forceps
- receiver for placenta
- drugs:
  - analgesia
  - ergometrine
  - oxytocin
  - antibiotics
- syringes and needles.

Analgesia

Use an analgesic such as pethidine 25 mg IV, and a sedative such as diazepam 10 mg IV.

If the pethidine and diazepam are not available, use another appropriate analgesic, if available, and continue gently with the manual removal of the placenta as it is a life saving procedure.

Procedure

1. Provide emotional support to the woman throughout.

2. Help the woman lie on her back with knees bent. If she is unable to void urine, catheterize and empty the bladder. A full bladder can prevent the delivery of the placenta.

3. Administer analgesic.

4. Wash and scrub your hands and arms well.

5. Clean around the vagina and the perineal area with an antiseptic solution.

6. Put on short sterile gloves first. Part the labia and clean the vestibule, i.e. the area inside the labia minora. Then, on the hand that will be inserted into the vagina, put on a long sterile glove on top of the short one. This will prevent the introduction of bacteria from the arm. (If no long glove is available, use a second short glove, cut off the part for the fingers and use the rest to lengthen the first glove)

7. Hold the umbilical cord with a clamp and pull cord gently until it is taut and parallel with the floor.

8. Introduce the other, long-gloved hand into the vagina with the fingers and thumb straight but close together and follow the cord, using a gentle rotation movement to go through the cervical os into the uterine cavity (**Figure 9.1**). Follow the cord until you find the placenta. (Once you have put your hand into the uterus, do not bring your hand out until you have separated the placenta and are bringing it out of the uterus. Do not go in and out of the uterus as this increases the risk of infection).

9. Let go of the cord with your external hand and grasp the fundus of the uterus through the abdomen. This supports the uterus and provides counter traction during the manual removal to prevent inversion of the uterus. (**Figure 9.2**).

10. Reach the placenta and find its edge. Slip the fingers of your hand between the edge of the placenta and the uterine wall. With your palm facing the placenta and fingers held tightly together, use a sideways slicing movement to gently detach the placenta. Go all around the placental bed until all the placenta is detached from the uterine wall.

11. When all of the placenta is separated and in the palm of your hand, (**Figure 9.3**) gently withdraw the placenta from the uterus. Do not pull on just a piece of placenta for it may tear from the rest of the placenta. The membranes will follow the delivered placenta. Pull them out slowly and carefully as they might tear off and be left in the uterus giving rise to haemorrhage or infection.

12. Continue to provide counter-traction to the uterus with the other hand to prevent uterine inversion.

13. Insert your hand again to palpate the uterine cavity for any remaining placental tissue.

14. Add oxytocin 20 IU to 1 litre of IV fluid (either Ringer's lactate or normal saline) and give by intravenous infusion. Give rapidly if bleeding.

15. Have an assistant massage the uterus to encourage contraction.

16. If there is continued heavy bleeding, give ergometrine 0.2 mg IM to help the uterus contract, or prostaglandins depending on national policy (prostaglandins should not be given intravenously as this may be fatal).

17. Examine the removed placenta and check for completeness (**Figure 9.4**).

18. Check for tears in the birth canal and repair, as required.

Problems in the removal of the placenta.

- If the placenta does not separate from the uterine wall by gentle lateral movements of the finger tips at the line of cleavage, suspect placenta accreta and refer the woman to a higher level health facility for laparotomy and possible sub-total hysterectomy. No bleeding will occur from the uterine wall if the placenta is attached, only from areas where the placenta has separated
- If the placenta is retained due to a constriction ring, or if hours or days have passed since the birth of the baby, it may not be possible to get the whole hand into the uterus. Remove the placenta in fragments using two fingers, ovum forceps or a wide, blunt curette. Referral for exploration of the uterus under anaesthetic may be required because of the danger of retained placental tissue
- If postpartum haemorrhage occurs before, during, or after the manual removal, follow the management as described in Session 5.

Important points:

- As much as possible, use aseptic precautions during the procedure
- All intrauterine manipulations should be carried out slowly, smoothly and gently
- It is very easy to perforate the lower uterine segment if the hand is forced through the os
- It is also easy to perforate the uterine wall if forceful scratching or digging movements are made with the fingers.

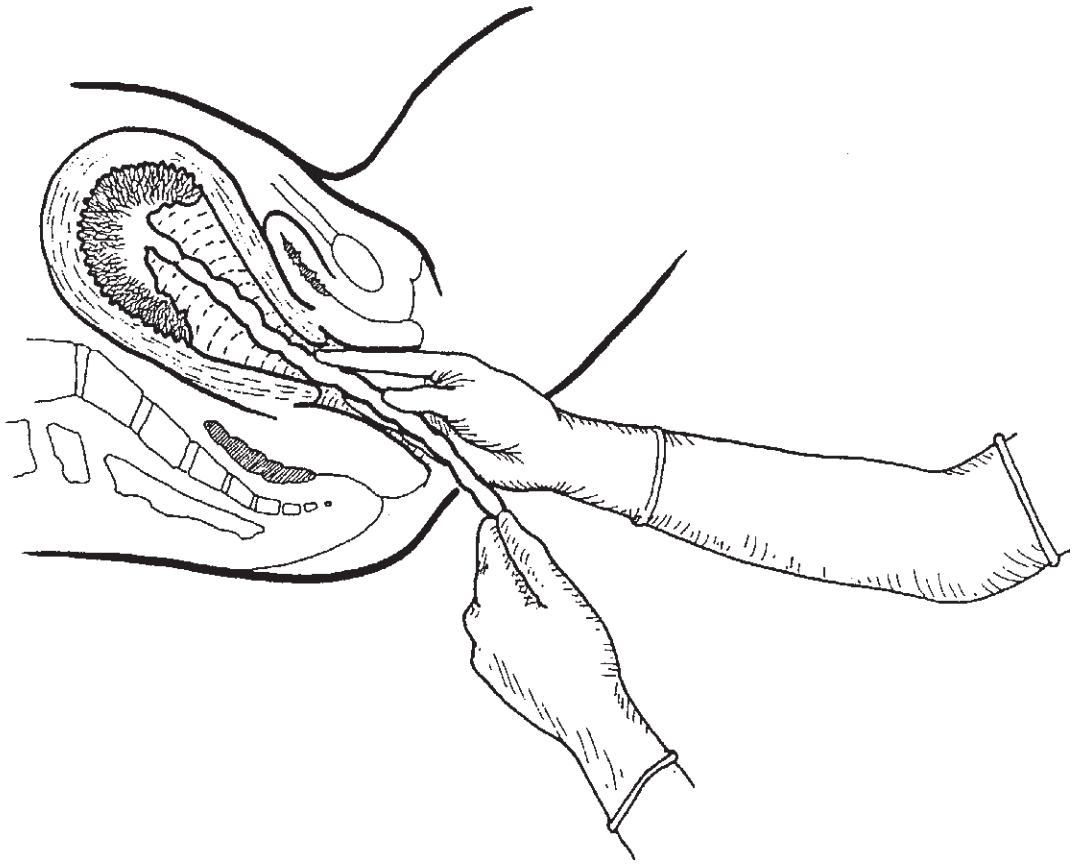

Figure 9.1 Manual removal of the placenta: introducing one hand into the vagina along the cord

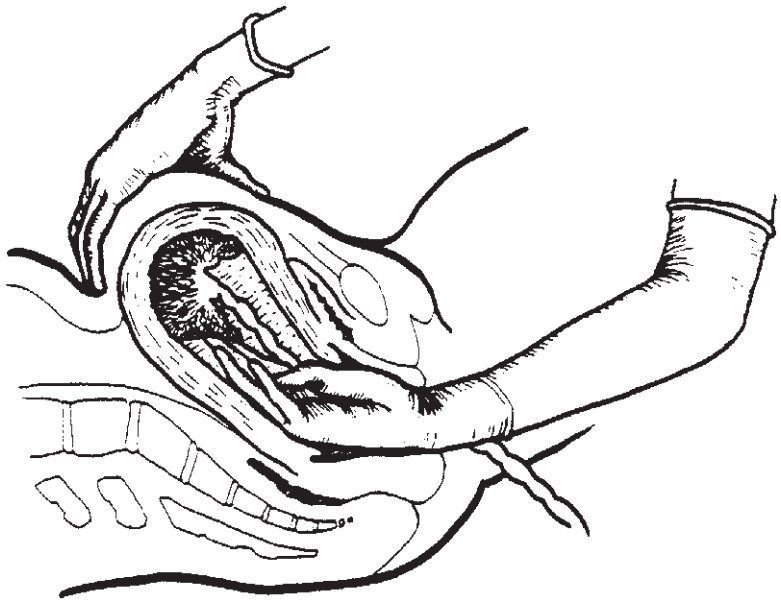

Figure 9.2 Manual removal of the placenta: grasping the fundus with the other hand, while detaching the placenta by a sidways slicing movement of the fingers

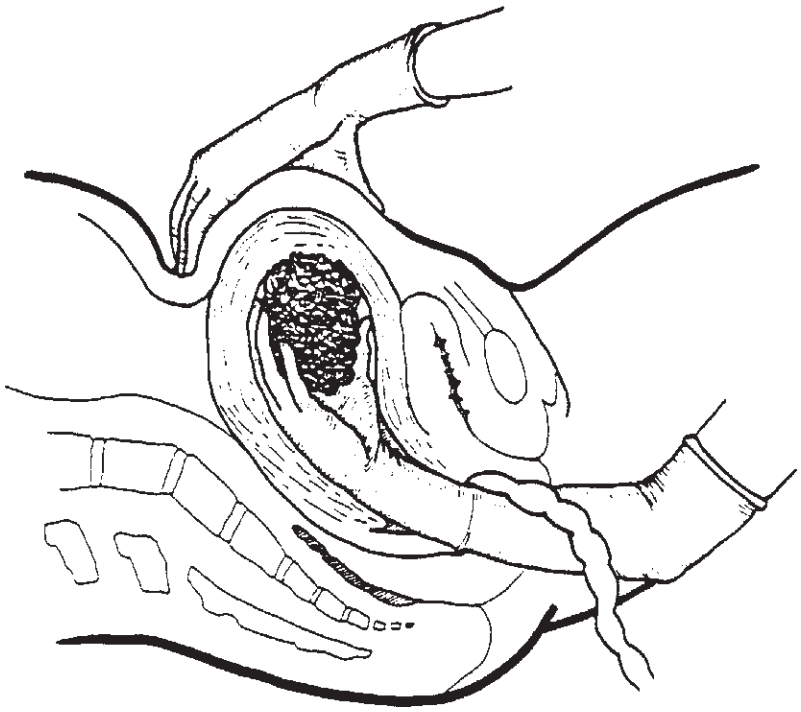

Figure 9.3 Manual removal of the placenta in palm of hand

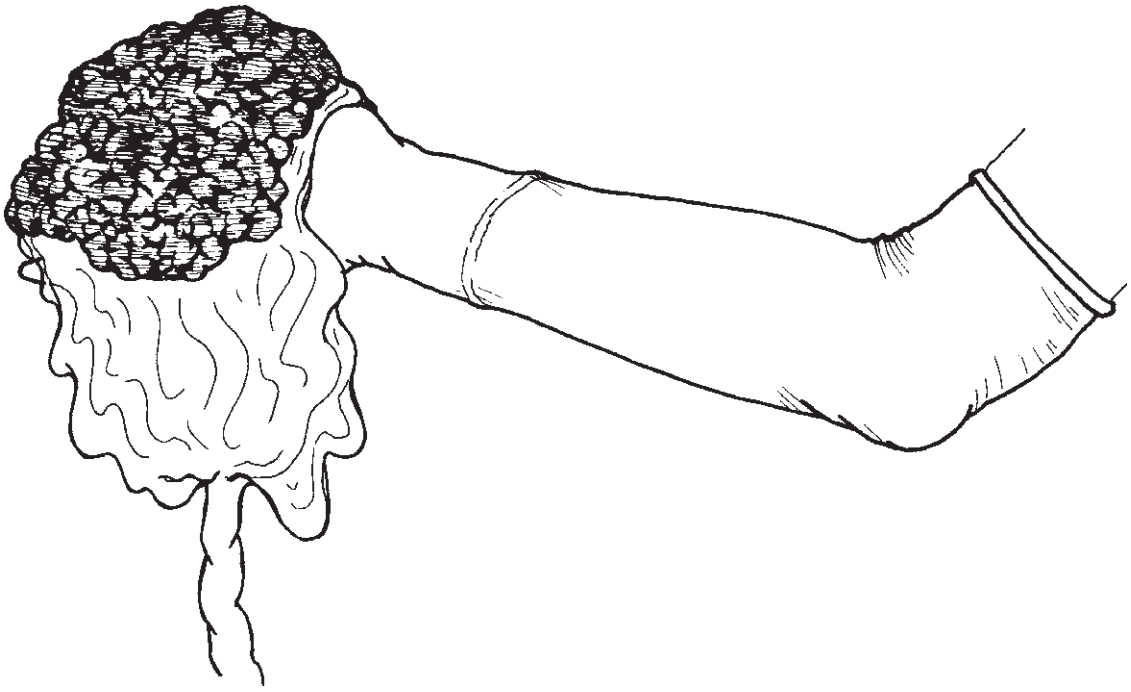

Figure 9.4 Manual removal of the placenta: examining the placenta for completeness

Care after manual removal of the placenta

- Monitor the woman's vital signs, i.e. pulse, blood pressure and respiration every 30 minutes for the next 6 hours, or until stable
- Observe her closely until the effects of IV sedation have worn off
- Palpate the uterine fundus and massage if not well contracted
- Check the vulval pad to observe the amount of bleeding
- Continue the IV infusion containing oxytocin
- If she is bleeding heavily and/or shocked, stabilize her condition and prepare for blood transfusion, or arrange referral if blood transfusion is not possible locally.

Complications and their management

The three major complications following manual removal of the placenta are:

1. Haemorrhage and shock.

2. Infection and septic shock.

3. Injury to, or rupture of, the uterus.

1. Management of haemorrhage

Find the cause for the bleeding (vaginal/cervical tear, retained bits of placenta, ruptured uterus).

If it is a tear, repair it. If bleeding comes from a torn vessel, clamp the vessel and tie it off. In cases of atonic bleeding, massage the uterus to make it contract and give oxytocin 10 IU IM or ergometrine 0.2 mg IV stat, followed by oxytocin 20 IU in 1 litre if IV fluid and infuse quickly to control bleeding.

In cases of retained pieces of placenta, prepare for exploration of the uterus under sedation or general anaesthetic. If bleeding is heavy and theatre facilities are not available, remove retained placental tissue manually, as described previously (remember aseptic techniques: wash hands and use gloves). After you have removed them, apply bimanual or aortic compression to the uterus until the bleeding stops. Give oxytocin 10 IU IM or ergometrine 0.2 mg IV, followed by an intravenous infusion of normal saline or Ringer's lactate to which oxytocin 20 IU has been added.

In cases of ruptured uterus, laparotomy is needed for repair of the uterus or a hysterectomy may be necessary. Arrange urgent referral if surgery is not possible locally.

Give blood transfusion if necessary; if not possible locally, arrange for referral to a higher level health facility where it can be given.

In all cases monitor pulse, blood pressure, respiration, fundus and vaginal blood loss frequently.

2. Management of infection

Any rise in temperature or chills should alert you to the possibility of infection. If you suspect infection, take a high vaginal swab and send it to the laboratory for culture and sensitivity.

Put the woman on a combination of antibiotics as follows:

- ampicillin 2 g IV every 6 hours, **and**
- gentamicin 5 mg/kg IV every 24 hours, **and**
- metronidazole 500 mg IV every 8 hours.

Continue antibiotics until fever-free for 48 hours. If fever still present after 72 hours, refer for re-assessment and appropriate treatment.

3. Rupture of uterus

Women who come with retained placenta after home delivery, are most likely to have injury to the uterus from an unsuccessful attempt(s) to remove the placenta.

Injury to the uterus can be caused by rough handling of the uterus during manual removal of the placenta. If the woman has had a previous curettage, a previous caesarean section or uterine operation, there may be weak areas in the uterine wall making it particularly susceptible to rupture.

Rupture of the uterus requires immediate laparotomy with possible hysterectomy or repair of the tear. Treat for shock and refer urgently.

Assessing competence

The following checklist should be used during direct observation of the student performing manual removal of placenta, 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 practice. The teacher must then use the checklist again to observe and assess the student's competence.

Clinical skills checklist for manual removal of placenta ✓			
Step	**Yes**	**No**	**Remarks**
Instruments and supplies: ▪ prepares instruments, room and supplies			
Patient preparation: ▪ provides reassurance and emotional support to the woman ▪ takes blood for Hb, typing and cross-matching ▪ starts IV drip of either sodium lactate or normal saline ▪ gives prophylactic antibiotics ▪ if shock is severe, gives plasma expanders or blood (when safe blood is available) ▪ checks that the uterus is firm and well contracted ▪ asks the woman to empty her bladder ▪ explains the procedure to the woman ▪ cleans around the vagina and perineal area with an antiseptic solution ▪ gives analgesic			
Steps in the procedure: ▪ scrubs hands and puts on short sterile gloves ▪ cleans labia ▪ puts on long sterile gloves ▪ gently inserts hand with long glove into vagina, whilst other hand grasps the umbilical cord ▪ withdraws hand, keeping placenta in palm of hand and external hand on fundus, keeping counter-traction on the uterus ▪ checks placenta for completeness (if unsure it is complete, inserts hand again to check uterine cavity is empty) ▪ checks vagina and cervix for tears ▪ applies a sterile pad to the perineum ▪ gives oxytocic drug and checks uterus is well contracted ▪ provides emotional support to the woman throughout, using good interpersonal communication skills			
Immediate post-procedural care: ▪ monitors the woman's vital signs and checks for vaginal bleeding, uterus remains firm and contracted immediately following the procedure, then every 30 minutes for the next 6 hours or until the woman's condition is stable ▪ replaces fluids intravenously and starts blood transfusion, if necessary ▪ gives an analgaesic (e.g. paracetamol) for pain if requested ▪ ensures the woman is comfortable and is under constant supervision, or has ready means to call for assistance if she feels she is bleeding ▪ makes referral to a higher level of care, if required ▪ completes all records			

Teacher's comments:

Student's comments:

10 CASE STUDIES

SESSION 10
CASE STUDIES

Aims

- To enable students to reflect on practice and realize the important link between process and outcome in respect of preventing and managing postpartum haemorrhage.
- To make practical recommendations which will improve the outcome when managing postpartum haemorrhage.

Objectives

On completion of Session 10, 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 case studied, emphasizing important points of practice in the prevention and management of PPH.
- Discuss how other women may also benefit from aspects of care which contributed to a safe outcome, or from lessons learned from a poor outcome.
- Describe how improved maternity care can influence the outcome of the third stage of labour and the management of PPH, 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 the 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 10 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. 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.

   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. 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 where a woman has suffered from postpartum haemorrhage 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 points about good practice which will be discussed by the class as a whole. Emphasize that these are important in saving lives and therefore in promoting safe motherhood. Discuss how good practice can be further developed/encouraged and how practice which is not good can be avoided.

The class should also have put forward recommendations about practice that needs to be improved. These recommendations should address the following questions.

- *WHAT needs to happen?*
- *HOW can it happen?*
- *WHO will take responsibility?*
- *WHO will help?*
- *WHERE will the action take place?*
- *WHEN will the action take place?*
- *WHEN will it be evaluated?*

INSTRUCTIONS FOR STUDENTS
Guidelines for case study: prevention of PPH

Your case study must concern some aspect of prevention of postpartum haemorrhage.
Write out a report which includes the following information:

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 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 puerperium:	

SUMMARY OF CARE AND MANAGEMENT TO DATE

You will be required to discuss the following important issues.

1. What happened? This will include minimum blood loss after delivery.	This is the outcome
2. What risk factors for PPH were present and how were they managed in order to prevent PPH.	This is the process
3. How was the third stage of labour managed?	
4. Summarize the main points of midwifery practice, emphasizing points in preventive care.	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 PPH.	This demonstrates what can be learned through experience

INSTRUCTIONS FOR STUDENTS
Guidelines for case study: management of PPH

Your case study must concern some aspect of management of postpartum haemorrhage.
Write out a report which includes the following information::

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 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 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 PPH and the condition of the woman on completion of labour.	This is the outcome
2. What risk factors for PPH were present (e.g. history of previous PPH, anaemia or other risk)	This is the process
3. How were pregnancy and the first, second and third stages of labour managed?	
4. Summarize the main points of midwifery practice, emphasizing how the case was managed	This considers the relationship between process and outcome
5. Were any opportunities missed? Some 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.

Discussion of case studies on the Management of PPH.

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 PPH safer in your practice area.

Appoint a person to report back.

11 DO YOU KNOW?

SESSION 11
DO YOU KNOW?

Aims

- To enable students to learn essential facts needed in preventing and managing postpartum haemorrhage.
- To enable students to appreciate the positive and negative factors which influence the process and affect the outcome, and to understand that they themselves can influence these factors.

Objectives

On completion of Session 11, students will be able to:

- Recall the basic facts concerning third stage management and the prevention and management of postpartum haemorrhage.
- Discuss practice points which assist in preserving the life and health of a woman who suffers a postpartum haemorrhage.
- Discuss practice points which can be dangerous when managing a woman who suffers a postpartum haemorrhage.

If tutorials are also used, the following objectives can also be achieved:

- Discuss how good practice points can be implemented in their own clinical practice.
- Discuss how bad practice points can be avoided in their own clinical practice.
- Identify factors which may interfere with good practice and decide on ways to deal with these.

Plan

Learning game 1 hour–1½ hours).
Optional tutorials (1 hour per student or small group of students).

Resources

Learning game: Do you know?

INTRODUCTION

This session provides an opportunity for students to review facts about conducting the third stage of labour and the prevention and management of postpartum haemorrhage.

It is also designed to teach the students aspects of good and poor practice. It is hoped that these points will become so familiar to them that they will influence their practice. It is very important that students realize how:

- *the process affects the outcome, and*
- *they can influence this.*

This idea should be familiar. It must now be reinforced.

THE LEARNING GAME

Unless you have several copies of the game, you will need to arrange separate times for small tutorial groups of students to play this game.

Ensure that you are available in case of disagreement about the answer. Students will not be expected to give the answer word for word as it is written on the card, but it is important that the meaning of the answer given is correct. This is where you will be needed, especially when the students are playing this game for the first time.

It will be useful to give students the opportunity to play the game often during this module. They can use it to learn and to revise facts. Repeated use will deeply impress the good and bad practice points on them and better enable them to apply the good points to their practice.

At the end of the game, discuss the experience with the students. There will usually be areas where they will want further explanation in order to learn and understand. This will be a good opportunity for teaching when they are motivated to learn.

OPTIONAL TUTORIALS

Small group tutorials

You may consider it appropriate to arrange a tutorial with the group of students who have played the game together. First, introduce the students to the objectives for tutorials.

The tutorial will help students to:

- *discuss matters that arise during the game*
- *receive further explanation where this is needed*
- *apply the lessons they have learned to practice.*

Take each of the "good practice" chance cards in turn and ask questions such as:

- *why was this good practice?*
- *what might happen if it had not been done?*
- *are there any problems in doing this in our own practice area?*
- *if so, how can we overcome these in order to promote safe practice?*

Take each of the "bad practice" chance cards in turn and ask:

- *why was this bad practice? What problems did it cause?*
- *what should the midwife do in this situation?*
- *are there any problems in doing what you suggest is good practice?*
- *how can we overcome these? Then make sure that what is suggested is carried out.*

Individual tutorials

If a student has difficulty in answering the questions in the game, it would be good to give them help through an individual tutorial. This is time-consuming, but can be extremely valuable in helping students who are finding learning difficult. Be tactful in making arrangements. It is important for students to maintain self-respect and the respect of others if they are going to continue learning.

Some students who are slow at first, may have a problem with the language rather than the subject matter, and may develop into excellent practitioners.

Some students who have enquiring minds may not memorize answers word for word, but will think about them in greater detail. You should urge students therefore to also give points for the correct meaning, rather than just a word for word answer which they may not understand.

The aim of this learning game is:

- To assist students to review essential facts needed in preventing and managing postpartum haemorrhage.
- To help them to appreciate the positive and negative factors which influence the process and affect the outcome.
- To assist them to understand that they themselves can influence these factors.

Rules of the game

You are provided with

- a board.
- a set of cards.

You will also need

- a small table for players to sit around, so that they can easily see and reach the board.
- a dice.
- a different coloured button for each player.

The game is suitable for 2 to 6 players.

Preparing to play

1. Place the board in the centre of the table.
2. Ask someone who is not playing the game to mix the cards so that those of different values (i.e. 2, 3, 4 and 5 points) are all mixed up together, including the "chance" cards.
3. Place the cards in two piles on opposite sides of the board so that all players can reach one of the piles of cards. The cards must be placed face downward.
4. Each player chooses a different coloured button which they should place on the table in front of them.

Playing the game

1. Each player in turn should shake the dice once, and throw. The aim is for the dice to land on a 6. No player may place their button on the board until they have thrown a 6 on the dice. Throwing a 6 means "You are in the third stage of labour", so the player now places their button on the first square marked start.
2. The player who has thrown a 6 now has another turn. They then move their button forward the same number of squares as the number shown on the dice.
3. The players move their buttons along the spiral pathway, gradually moving towards the centre of the board.
4. If a player lands on a square marked with a question mark, the player on their right picks up a card from one of the piles of cards and reads aloud the question written on it (but not the answer). The player who has landed on the "question square" must then attempt to answer the question.

5. The answer must be exactly right. This means that the answer given by the player must correlate with that written on the card. They may, of course, use different words to explain the meaning.

6. If the player gives the correct answer, they are given the card to keep. The card is worth 2, 3, 4 or 5 points which they will add to their total at the end of the game.

7. If the player gives the wrong answer, the player holding the card must read aloud the correct answer, and place the card at the bottom of the pile of cards.

8. If the player who is asked does not know the answer, the question is offered to the player on their left. If this player answers correctly, they are given the card to keep. If they do not know the answer, the question can be offered to the next player on the left until all players (except the one asking the question) have had a chance to answer. If no one knows the answer the player holding the card should read aloud the answer. They should then place the card at the bottom of the pile.

9. There are also some "chance" cards included. These do not ask questions, but make statements. These statements apply to midwifery practice

   - Statements which describe good practice give the player free points which they can add to their score.

   - Statements which describe bad practice make the player subtract points from their score.

   When a "chance" card is picked up it must be read aloud and given immediately to the player who has landed on the question square.

10. The next player then throws the dice and the game continues.

11. When a player reaches the centre of the board, the teacher may decide that the game is finished for that player. This is useful if there is just a short time to play the game. Otherwise the teacher may allow the player to start again until all the cards have been used up. It is suggested that this method is used whenever time allows.

12. At the end of the game, all players add up the points on the cards which they now own. They must subtract points that are shown on the "bad practice" chance cards in their possession.

13. The winner is the player with the highest score.

There are several reasons why the winner may not necessarily be the player who knows the most, and the loser the one who knows the least. Firstly, some players will land on more question squares than others and will have opportunity for more questions. Secondly the "chance" cards will cause players to gain free points but also to lose some points they have gained. In fact, players could end up with a minus score if they pick up too many "bad practice" chance cards.

The game should allow everyone to have fun and learn without feeling threatened. This is helpful when studying. Everyone should learn some new facts about postpartum haemorrhage and remember the good and bad practice points which can make the difference between life and death. Learning these will be an important step towards promoting safe motherhood.

Enjoy the game and learn through it.

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.

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.

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.

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). ***Haemorrhagic shock*** is shock due to low blood volume resulting from excessive blood loss. ***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 a 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 to 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.

APPENDIX: PRE- AND POST-TEST QUESTIONS

The pre- and post-test questions (and answers) which follow are provided as examples, and do not constitute the full and complete range of questions which should be included in pre- and post-tests, should you choose to use them as a method of student assessment. You may wish to use these questions, together with other questions relevant to the content of this module, to establish a baseline for students' theoretical knowledge. The questions used in the pre-test should be used again in the post-test to determine change in theoretical knowledge. The teacher may also wish to add more questions for the post-test.

Each time you use the module for teaching about postpartum haemorrhage, it is important to change at least some of the questions used in pre- and post-tests. This is particularly relevant in, for instance, schools of midwifery and nursing where students communicate frequently with each other about the content of tests and examinations.

Pre- and post-tests must not be used to the exclusion of other options for assessment of students. It is critical to use at least some, if not all, of the other options, found at intervals throughout the modules, for assessing the progress of students during the course of study. Moreover, it is essential to bear in mind that the assessment of clinical competence constitutes the major component of student assessment in this and the other technical modules.

Q1 *What fibres of the myometrium are important in controlling bleeding in the third stage of labour?*

A The oblique fibres which form the middle layer (also known as "criss-cross").

Q2 *How is bleeding controlled after the third stage of labour?*

A After delivery of the placenta the oblique muscle fibres of the myometrium contract strongly to compress blood vessels and clots form in the torn blood vessels

Q3 *What are two factors that interfere with bleeding control?*

A Retained placenta or membranes or parts of these and a full bladder.

Q4 *How is postpartum haemorrhage defined?*

A Excessive bleeding from the genital tract after the birth of the baby (i.e. 500 ml or more, or any lesser amount that causes a deterioration in the condition of the woman).

Q5 *What are the two most common causes of primary PPH?*

A Atonic uterus, and genital tract trauma.

Q6 *What are four risk factors for PPH (arising during pregnancy)?*

A Any four of the following: placenta praevia, abruptio placenta, polyhydramnios, multiple pregnancy, intrauterine death, any condition associated with anaemia (e.g. malaria, hookworm).

Q7 *What are three causes of secondary PPH?*

A Retained fragments of placenta or membranes, shedding of dead tissue following obstructed labour, breakdown of uterine wound

Q8 *What are the three principles of managing PPH?*

A Speed, skills and priorities.

Q9 *In managing atonic uterus when the placenta has been delivered, what is the first thing to do?*

A Rub up a contraction and expel any clots from the uterus.

Q10 *When is it appropriate to use manual compression of the aorta in the management of PPH?*

A It should be used in an emergency to control torrential haemorrhage if the woman is still bleeding after the initial management of PPH has been carried out (i.e. massage the uterus, expel clots, give oxytocin 10 IU IM, start an IV infusion and infuse IV fluids, add oxytocin 20 IU to IV fluids, empty bladder, examine the genital tract for tears).