

# Education material for teachers of midwifery

Midwifery education modules - second edition

## Managing eclampsia



**World Health  
Organization**

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## Managing eclampsia



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# INTRODUCTION

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## INTRODUCTION

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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<sup>1</sup> 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

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

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

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

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

## **CONTENT OF THE MODULES**

### **The midwife in the community**

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

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

### **Managing postpartum haemorrhage**

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

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

### **Managing prolonged and obstructed labour**

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

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

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

### **Managing puerperal sepsis**

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

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

### **Managing eclampsia**

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

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

### **Managing incomplete abortion**

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

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

## **TEACHING–LEARNING METHODS**

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

### **Modified lectures**

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

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

### **Discussions**

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

### **Group work and feedback**

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

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

### **Tutorials**

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

### **Practical exercises**

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



### **Community visits**

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

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

### **Clinical teaching**

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

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

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

### **Drama and role play**

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

### **Case studies**

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



### **Learning games and puzzles**

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

### **Workshops**

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

## **Reflection**

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

## **ASSESSMENT OF STUDENTS**

### **Pre- and post-tests**

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

### **Assessing clinical competence**

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

### **Other options for assessment**

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

## PLANNING FOLLOW-UP ACTIVITIES

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

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

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

## SUMMARY OF MODULE

Session	Teaching–Learning methods	Time frame (approximate)
1. UNDERSTANDING ECLAMPSIA	Modified lecture, group work, discussion	1½ hours
2. AVOIDABLE FACTORS	Modified lecture Group work Feedback, discussion	½ hour 1 hour 1½ hours
3. IDENTIFYING THE PROBLEM	Modified lecture Clinical teaching  Group work, feedback, discussion	½ hour 1 hour per small group of students  2 hours
4. MANAGING ECLAMPSIA	Modified lecture, discussion	2 hours
5. LEARNING CLINICAL SKILLS	Modified lecture Clinical teaching, discussion	2 hours 1 hour per small group of students, per skill
6. CASE STUDIES	Case studies, discussion, group work, feedback Optional tutorials	3 hours  1 hour per student or small group of students

## GETTING STARTED

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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 session and the other sessions in the module.



# 1

## UNDERSTANDING ECLAMPSIA

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# SESSION 1

## UNDERSTANDING ECLAMPSIA

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### Aims

- To enable students to understand eclampsia and its associated risks, and the importance of early diagnosis and management in order to save lives.

### Objectives

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

- Define hypertension, pregnancy-induced hypertension, pre-eclampsia and eclampsia.
- Describe the signs of impending eclampsia.
- Describe the stages of an eclamptic fit.
- Explain why an eclamptic fit is dangerous for mother and fetus.
- Describe other causes of convulsions which may occur in women of childbearing age.

### Plan

Modified lecture.

Group work.

Discussion.

Total time: 1½ hours.

## INTRODUCTION

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*Introduce the module by explaining that eclampsia accounts for 12% of all maternal deaths in developing countries. This figure is an average only, as some countries have a much greater incidence of eclampsia than others. It is very important for midwives to be able to detect the onset of early pre-eclampsia, to teach women and their families the symptoms of imminent eclampsia and the need to seek help immediately if these symptoms develop, and to take urgent and appropriate action in cases of severe pre-eclampsia and eclampsia to reduce the risk of maternal death.*

## DEFINITIONS

### Hypertension

Hypertension is a diastolic blood pressure of 90 mmHg or more; the hypertensive disorders of pregnancy include:

- pregnancy-induced-hypertension which occurs after 20 weeks gestation, in labour or within 48 hours of delivery; and
- chronic hypertension which is present before 20 weeks gestation.

Diastolic blood pressure is a more reliable indicator of significant hypertension than systolic blood pressure. Diastolic blood pressure measures peripheral resistance and does not vary so much with the woman's emotional state as systolic blood pressure. Diastolic blood pressure is taken at the point at which the arterial sound disappears. A falsely high reading is obtained if the cuff does not encircle at least three-fourths of the circumference of the arm; a wider cuff should be used when the diameter of the upper arm is more than 30 cm. If the diastolic blood pressure is 90 mmHg or more on two consecutive readings taken four hours or more apart, a diagnosis of hypertension is made. It may be necessary to reduce the time interval to less than four hours in some situations, e.g. in an antenatal clinic or in cases when the diastolic blood pressure is very high, e.g. 110 mmHg or more.

### Proteinuria

Proteinuria changes the diagnosis from pregnancy-induced-hypertension to the more serious condition of pre-eclampsia. Other causes of protein in the urine include urinary tract infection, kidney disease, contamination of the urine specimen, e.g. with vaginal discharge, blood or amniotic fluid, severe anaemia and heart failure. Any woman, however, with both hypertension and proteinuria should be considered to have pre-eclampsia and treated accordingly.

The urine should always be checked for protein when hypertension is found in pregnancy. The urine for testing should be a clean-catch, midstream specimen to avoid contamination by vaginal secretions. Dipsticks may be used and a change from negative to positive in pregnancy is a warning sign which should not be ignored.

If dipsticks are not available, the urine should be tested as follows:

- heat a clean-catch, midstream specimen of urine in a clean test-tube to boiling point. The boiled urine becomes cloudy
- add one drop or two of 2% acetic acid to the urine after boiling. If the urine remains cloudy, protein is present in the urine. There is no protein if the urine is clear. If no acetic acid is available, boil the top half of the urine in the test-tube and allow the urine to stand. A thick precipitate at the bottom of the tube indicates protein.

## Pregnancy-induced hypertension

Pregnancy-induced hypertension may progress from a mild hypertension disease to a life-threatening condition, as follows:

- hypertension without proteinuria or oedema
- mild pre-eclampsia
- severe pre-eclampsia
- eclampsia.

Women with pre-eclampsia do not feel ill until the condition is severe. Then the disease is life threatening. The insidious nature of the disease is one of the reasons why it is so dangerous. Early detection by regular antenatal monitoring and careful follow-up of those with mild pre-eclampsia is therefore essential for the early diagnosis and treatment of severe eclampsia. Sometimes mild pre-eclampsia progresses to severe pre-eclampsia and eclampsia very suddenly with little or no warning. This is called fulminating pre-eclampsia and is very dangerous for both mother and fetus.

## Classifying pre-eclampsia and signs of imminent eclampsia

Finding	Mild pre-eclampsia	Severe pre-eclampsia
Diastolic blood pressure	Raised to 90–110 mmHg on two occasions 1–4 hours apart after 20 weeks gestation	Raised to 110mmHg or more after 20 weeks gestation
Proteinuria	Up to 2+	3+ or more

**Other signs of severe pre-eclampsia are as follows:**

Headache	Absent	May be present
Visual disturbances	Absent	May be present
Upper abdominal pain (epigastric region)	Absent	May be present
Oliguria (less than 400 ml in 24 hours)	No oliguria	Diminished urinary output to less than 400 ml in 24 hours
Hyper-reflexia	Absent	May be present
Pulmonary oedema	Absent	May be present

If a woman develops any of the symptoms and signs of severe pre-eclampsia, urgent treatment is required to try and prevent the onset of eclampsia. The management of severe pre-eclampsia is the same as for eclampsia (see Session 4).

## Eclampsia

Eclampsia is the onset of fits in a woman whose pregnancy is usually complicated by pre-eclampsia. The fits may occur in pregnancy after 20 weeks gestation, in labour, or during the first 48 hours of the postpartum period. There is a high incidence of maternal death in women with eclampsia. Perinatal mortality is also high.

Pre-eclampsia and eclampsia are part of the same disorder with eclampsia being the severe form of the disease. Pre-eclampsia almost always precedes eclampsia. However, not all cases follow an orderly progression from mild to severe disease and some women develop severe pre-eclampsia or eclampsia very suddenly.

Occasionally convulsions occur when there is no hypertension, only proteinuria. Other women may have raised blood pressure and proteinuria, but only one or two of the signs of severe pre-eclampsia when a fit occurs.

## STAGES OF AN ECLAMPTIC FIT

If students are familiar with epileptic fits they should not have any difficulty in understanding the stages of an eclamptic fit. It is similar to an epileptic fit.

### 1. Premonitory stage

This lasts 10–20 seconds, during which:

- the eyes roll or stare
- the face and hand muscles may twitch.

### 2. Tonic stage

This lasts up to 30 seconds, during which:

- the muscles go into violent spasm
- the fists are clenched and arms and legs are rigid
- the diaphragm (which is a muscle separating the chest from the abdomen) is in spasm, so that breathing stops and the colour of the skin becomes blue or dusky (cyanosis)
- the back may be arched
- the teeth are clenched
- the eyes bulge.

### 3. Clonic stage

This lasts 1–2 minutes and is marked by:

- violent contraction and relaxation of the muscles
- increased saliva causes “foaming” at the mouth and there is a risk of inhalation
- deep, noisy breathing
- the face looks congested (filled with blood) and swollen.

#### 4. Coma stage

This may last for minutes or hours. The woman is deeply unconscious and often breathes noisily. The cyanosis fades but her face may still be swollen and congested. Further fits may occur.

The woman may die after only one or two fits.

### HOW ECLAMPSIA AFFECTS MOTHER AND FETUS

*Explain that widespread spasm of arterioles affects most organs in the body causing organ failure that endangers the lives of mother and fetus. Ask students to work in pairs. Ask half the class to list effects of eclampsia on the mother, and the other half to list effects on the fetus.*

#### Effects on the mother

These include:

- respiratory problems (asphyxia, aspiration of vomit, pulmonary oedema, broncho-pneumonia)
- cardiac problems (heart failure)
- effects on the brain (haemorrhage, thrombosis, oedema)
- renal complications (acute kidney failure)
- hepatic disease (liver necrosis)
- HELLP syndrome (haemolysis, elevated liver enzymes, low platelet count)
- coagulopathy (clotting/coagulation failure)
- visual disturbances (temporary blindness due to oedema of the retina)
- injuries during convulsions (fractures).

The main causes of maternal death in eclampsia are intracerebral haemorrhage, pulmonary complications, kidney failure, liver failure and failure of more than one organ (e.g. heart + liver + kidney).

#### Effects on the fetus

Pre-eclampsia is associated with a reduction in maternal placental bloodflow which results in:

- hypoxia
- intrauterine growth retardation (IUGR)
- in severe cases the baby may be stillborn.

Hypoxia may cause brain damage if severe or prolonged, and can result in:

- physical or mental disability.

*Ask if there are any questions.*

*Summarize the session.*

# 2

## AVOIDABLE FACTORS

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## SESSION 2

### AVOIDABLE FACTORS

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#### Aims

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

#### Objectives

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

- Define avoidable factors, risk factors, direct obstetric death, and indirect obstetric death.
- List the risk factors for eclampsia and identify those that are avoidable.
- Discuss the steps to be taken in order to prevent death from the factors identified as avoidable.

#### Plan

Modified lecture (½ hour).

Group work (1 hour).

Feedback, discussion (1½ hours).

#### Resources

Instructions for Students.

Worksheet.

## INTRODUCTION

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

### **Risk factors:**

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

*It is important that students understand the following:*

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

### **Direct obstetric death:**

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

### **Indirect obstetric death:**

is a death resulting from previous existing disease or disease which developed during pregnancy 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 in relation to eclampsia and discuss them, confirming that they are avoidable. For instance:*

- *A woman has an elevated blood pressure on her first visit to the antenatal clinic at 24 weeks. She has to walk a long distance in order to get to the clinic. This long walk could have been avoided if home visits were carried out to provide antenatal care. She may also have had earlier antenatal care, and it would then have been possible to distinguish between essential hypertension and pregnancy-induced hypertension.*

*Ask students for other examples.*

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

- Eclampsia can be a cause of death. However, with early detection and appropriate management of pre-eclampsia, it may be avoided
- The cause of pre-eclampsia is still not fully understood and therefore it is not possible to prevent the onset of the disease.

Education of women, families and the community about the disease and the importance of early and regular antenatal care, may promote early detection and treatment of the disease. All women should be checked for pre-eclampsia at each antenatal visit.

## GROUP WORK

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

## Feedback

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

*Bring the students' attention to community and health service risk factors which make the danger of dying from eclampsia greater (see checklist for eclampsia on the following page).*

*Discuss with students the role of the midwife in community education. Pregnant women, their families, TBAs, and community leaders have to be educated about the importance of antenatal care, including monitoring blood pressure and testing urine, and about the danger signals of severe pre-eclampsia and eclampsia.*

*Stress also the importance of access to health facilities and transportation in preventing deaths from eclampsia.*

*Discuss traditional beliefs about convulsions and other complications during pregnancy, and the influence of traditional healers in the community. If there is distrust of health care personnel, the family of an eclamptic woman may prefer to contact a traditional healer. This will only delay referral to a health facility capable of treating eclampsia.*

*Help students realize that once a woman with eclampsia reaches a health facility she will die unless that facility has health staff properly trained in the management of eclampsia, and the necessary drugs are available. Discuss strategies to improve maternal care, such as meetings to compile an inventory of supplies and drugs needed to prevent or treat eclampsia or other complications, and a list of essential skills and tasks required by health staff.*

*Ask if there are any questions, and summarize the session.*

## CHECKLIST FOR ECLAMPSIA ✓

*After the group work take feedback. Use this checklist as a guide to the risk factors that should be mentioned.*

Pre-eclampsia and therefore the risk of eclampsia is more common in:

- primigravidae (especially young teenagers and women over 35 years)
- obese women
- women with essential or renal hypertension
- multiple pregnancy
- women with
  - diabetes
  - hydatidiform mole
  - polyhydramnios
  - hydrops fetalis.

The following risk factors make the danger of dying from eclampsia greater.

### **Community risk factors**

These include:

- lack of awareness about symptoms of severe pre-eclampsia and eclampsia and the importance of early and regular antenatal care
- transportation problems
- low socioeconomic status (this is because teenage pregnancy is more common among the poor)
- financial hardship and inability to pay for transport and medical care
- community distrust of health care personnel.

### **Health service risk factors**

These include:

- failure to monitor blood pressure and urine during antenatal care
- failure to counsel women and families about dangerous symptoms of severe pre-eclampsia and the importance of regular antenatal care
- delay in referral of women with symptoms and signs of severe pre-eclampsia or eclampsia
- lack of a clear-cut management strategy/clinical protocols for dealing with pre-eclampsia and eclampsia
- inadequately trained staff to treat women with severe eclampsia or eclampsia
- lack of proper equipment and drugs to treat eclampsia.

## INSTRUCTIONS FOR GROUP WORK

(Please read all the instructions carefully before you begin)

1. Define eclampsia.
2. List the risk factors for eclampsia (these are factors which make the chance of eclampsia more likely or more dangerous).
3. Mark the risk factors which are avoidable or can be anticipated.
4. State the steps which must be taken to prevent these avoidable factors, or to reduce the risk.

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

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

Appoint a group leader and a person to report back.

**Example:**

Risk factors	Avoidable?	Steps to avoid occurrence
Failure to monitor blood pressure and urine for protein during pregnancy.	Yes	Check blood pressure at every antenatal visit and urine at first visit and if diastolic blood pressure 90mmHg or more; discuss the importance of antenatal care with community leaders, older women, families, and in schools.



<b>PREVENTING ECLAMPSIA</b>		
<b>Risk factors</b>	<b>Avoidable?</b>	<b>Steps to avoid occurrence</b>



# 3

## IDENTIFYING THE PROBLEM

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## SESSION 3

### IDENTIFYING THE PROBLEM

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#### Aims

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

#### Objectives

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

- List the steps involved in providing effective management.
- Recognize pre-eclampsia and eclampsia.
- Describe the clinical picture of a woman with eclampsia.
- Describe the clinical picture of a woman with other conditions which must be differentiated from eclampsia.
- Demonstrate how to make a diagnosis and a differential diagnosis for eclampsia.

#### Plan

Modified lecture (½ hour).

Clinical teaching (1 hour per small group of students).

Group work, feedback, discussion (2 hours).

#### Resources

Learning puzzle: Why is she having a fit?

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

## INTRODUCTION

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*Introduce this session by explaining that there are **six** steps to giving effective management.*

*The six steps are:*

- 1. Identify the problem.*
- 2. Decide on the aim of management.*
- 3. Select the best management.*
- 4. Provide management, determining priorities.*
- 5. Evaluate the outcome.*
- 6. Provide further management if necessary. This may include referral.*

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

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

*Ask students to form small 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 observation*
- uses all the senses (sight, hearing, smell, touch)*
- asks questions*
- takes all circumstances into account.*

*Relate this to discussion about diagnostic skills.*

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

*The following guidelines may help.*

*Students must use all 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 them all into consideration. Students must learn to do the same.*

## **RECOGNIZING PRE-ECLAMPSIA AND ECLAMPSIA**

*The length of this part of the session may vary according to the clinical experience of the students. It may be necessary to:*

- *review and update skills with post-basic staff*
- *teach new skills to inexperienced students.*

*All students must be able to:*

- *take and record blood pressure correctly*
- *test urine for protein.*

1. *Divide the students into small groups.*
2. *Take them into the ward, or use an opportunity during a visit to a clinic or home.*
3. *Select one patient (antenatal/in early labour/newly delivered) per student. After obtaining permission from the nurse/midwife responsible for care, the woman herself and her relatives (if appropriate), students should read the woman's history recorded in the case notes, talk to her in order to update details in her records and obtain the woman's perspective on her condition and then carry out a full clinical examination.*

### **Recognizing pre-eclampsia**

*Students must be able to identify signs of pre-eclampsia during clinical examination. Signs include:*

- *raised blood pressure*
- *proteinuria.*

*Make sure students know what level of blood pressure is abnormal (diastolic blood pressure 90mmHg or more). They should also understand that the diastolic blood pressure is a more accurate indicator of hypertension than systolic blood pressure which is affected more by the woman's emotional state. A diastolic blood pressure of between 90–110 mmHg is indicative of mild pre-eclampsia, whereas when it is 110 mmHg or more, the condition is severe. The students should also teach the women they are examining how to obtain a clean-catch, midstream specimen of urine which the students can then test for protein.*

## **Recognizing severe pre-eclampsia**

*Students should ask the mother questions, listen carefully to her replies, examine her, and identify any symptoms and signs of severe pre-eclampsia.*

*One or more of these signs should alert the midwife to the possibility of the woman having an eclamptic fit. Immediate treatment would be required to try and avert the fit.*

*If blood tests for renal function and coagulation complications have been carried out, students should check the laboratory reports. Haemolysis, elevated liver proteins, and low platelet count are indicative of the HELLP syndrome. This reflects the seriousness of the disease and how it adversely affects many systems of the body.*

*After students have demonstrated their skills at the bedside, discuss the findings. If different groups have examined different women at the same time, it is good to compare results.*

## **Questions for discussion**

*Which of the women examined are at risk of eclampsia? Why are they at risk?*

## **DIFFERENTIAL DIAGNOSIS**

*Any woman with a pregnancy of 20 or more weeks gestation and hypertension who has a fit, should be treated for eclampsia. If there is no hypertension, the woman is treated for eclampsia until proved otherwise. There are a number of other conditions which cause convulsions and these are to be considered next in this session.*

*If students have studied the Managing puerperal sepsis module, they will be familiar with the learning puzzle used in that module. If much of the material in this session so far is new to the students, the rest of the session may be completed on a different day. This will give time for the many new facts to be assimilated.*

*The clinical teaching may either precede or follow the learning puzzle, according to the teacher's wishes.*

*It is important to help students to understand how to identify the different causes of fits in order to give effective management. They must learn the art of diagnosis and differential diagnosis when a woman in their care has a fit.*

**Learning puzzle:  
“Why is she having a fit?”**

*This exercise is intended to help students identify other conditions which may cause fits and which may have to be distinguished from eclampsia. Students will learn to describe the clinical picture of these other conditions, outline the details which may be noted when taking a history, and list the tests and investigations which may be used to confirm diagnosis.*

*It can be helpful to think of a diagnosis in terms of building up a picture.*

*To identify the problem we must ask what is causing the fits.*

**The clinical picture**

*In order to help students practise putting together pieces of information which will help them make a diagnosis, divide them into groups to work on the puzzles.*

*Give each group clinical picture (A) plus two other pictures. Clinical picture (A) is eclampsia. The other pictures are:*

*(B) epilepsy*

*(C) cerebral malaria*

*(D) meningitis*

*(E) tetanus*

*(F) puerperal sepsis (septicaemia).*

*The three puzzles should be cut into pieces along the lines indicated and the three sets should be mixed together. The students will not know the diagnosis before they work on the puzzle.*

*Provide the students with the Instructions for Group Work.*

*Checklists are also provided at the end of the session. These include history, tests and investigations for each clinical picture. Use these checklists to guide the discussion when taking feedback.*

*During the group work, check that students are able to correctly put the pictures together to discover the diagnosis.*

## Feedback

*After the group work, ask each group to report on:*

- *the conditions they have diagnosed*
- *the facts they would expect to obtain on taking a history of the condition studied*
- *the tests/investigations which would help confirm diagnosis in the condition studied.*

*During feedback, take the opportunity to teach about the various conditions as appropriate. Arrange for clinical teaching in a medical ward, if necessary, when patients are admitted with any of these conditions. Ask a senior nurse or doctor to present case studies.*

## Class exercise

*Use the following class exercise to check students' understanding.*

1. *Give each group of students a piece of paper with the name of one of the clinical conditions A–F written on it. Make sure that eclampsia is included, but only once.*
2. *Ask each group in turn to present to the rest of the class the history, symptoms and signs of a woman with the condition indicated on their paper.*

*Encourage students to write on the blackboard, flipchart or use an overhead projector. However, they may choose to use drama to present a typical picture of the condition.*

3. *Insist that the class wait until all the facts are presented and/or the drama is complete before they state the diagnosis.*
4. *When each group has presented its case, summarize the main findings and ask if there are any questions.*
5. *Emphasize that when the clinical picture is not clear, a range of tests must be used to make a differential diagnosis.*

*On completion ask again if there are any questions. Summarize this part of the session, and finally summarize the whole session by linking theory to practice.*

## INSTRUCTIONS FOR GROUP WORK

### The Clinical Picture

1. You have been given many small pieces of card. Place them all on the table so that the black dot(s) on each piece faces upwards.
2. Separate the cards from each other so that you can easily read the symptoms and signs which are written on each one.
3. When the cards are fitted together correctly, they will form three complete clinical pictures. Each clinical picture has a drawing of a woman in the centre. Clinical symptoms and signs are written around the drawing. These may be experienced by a woman who has a fit.
4. Choose the cards which you think best fit together to describe the symptoms and signs of a particular condition which may be accompanied by a fit. Place the cards together to make a complete clinical picture.
5. When you have completed your three clinical pictures, read again the symptoms and signs and decide on the most likely diagnosis for the woman in each picture.
6. Write down your diagnosis for each clinical picture. One is marked A, and you have two others, B, C, D, E or F. Check your diagnosis by carefully turning the picture over, piece by piece, and reading the diagnosis written on the other side. The diagnosis can be seen only when all the correct cards are put together in their right order.
7. For each of the three clinical pictures, discuss and write down:
  - the typical facts you may obtain on taking a history from this woman
  - wherever appropriate, the tests or investigations which would help to confirm the diagnosis.

# CHECKLIST ✓

## A. Eclampsia

### History

Pre-eclampsia and therefore the risk of eclampsia is more common in:

- primigravidae (especially young teenagers and women over 35 years)
- obese women
- women with essential or renal hypertension
- multiple pregnancy
- women with
  - diabetes
  - hydatidiform mole
  - polyhydramnios
  - hydrops fetalis.

### Symptoms and signs

- convulsions
- diastolic blood pressure 90 mmHg or more after 20 weeks gestation
- proteinuria 2+ or more.

There may also be:

- coma
- other symptoms and signs of severe pre-eclampsia:
  - hyperreflexia
  - headache (increasing frequency, unrelieved by regular analgesics)
  - clouding of vision
  - oliguria (passing less than 400 ml urine in 24 hours)
  - upper abdominal pain (epigastric pain or pain in right upper quadrant)
  - pulmonary oedema.

### Tests/investigations to confirm diagnosis

Blood pressure is usually raised in cases of eclampsia. The urine will contain protein. Other tests can be carried out to diagnose or exclude various conditions. For example, a clean-catch, midstream specimen of urine may not only be tested for protein, but can also be sent to the laboratory for culture to check for infection.

Where available, blood tests may show impaired renal and liver function and coagulation defects in women with eclampsia. The blood tests which can be undertaken are:

- blood film to exclude malaria
- liver enzymes and function tests which will be elevated in eclampsia indicating liver damage

- platelet count which is often low in pre-eclampsia/eclampsia
- coagulation studies to detect coagulation failure (bedside clotting test)
- renal function tests (plasma electrolytes, blood urea, creatinine and uric acid) which are elevated in eclampsia indicating kidney damage. Creatinine clearance and serum proteins may be decreased.

Coagulation failure will place the woman at high risk of postpartum haemorrhage.

## CHECKLIST ✓

### B. Epilepsy

#### History

There is a history of epilepsy before pregnancy. In adulthood the onset of epilepsy is usually secondary to specific pathology (i.e. another condition). The condition may worsen, improve, or be unaffected by the pregnancy.

The fits described are likely to be grand mal. The woman may or may not be under medical care and may or may not be treated with anticonvulsants.

Warning of an impending fit takes different forms in different people. The woman can often describe how she usually feels before a fit.

Sometimes epileptic fits are less severe in adult life than in childhood.

In severe cases, there may be mental deterioration after some years.

#### Symptoms and signs

- convulsions
- past history of convulsions
- normal blood pressure.

#### Tests/investigations to confirm diagnosis

Other causes of fits must be ruled out.

Urine may show temporary proteinuria after a fit, but otherwise testing shows no abnormality.

Blood urea is normal.

Blood sugar may be low.

Where it is possible to carry out an ECG (electro-encephalogram), this may show typical abnormalities.

A brain scan may reveal the cause of the fits, e.g. it could be a tumour.

Referral to a high level health facility may be necessary for confirmation of diagnosis and treatment.

## CHECKLIST ✓

### C. Cerebral malaria

#### History

The area in which the woman is living will usually be known as a “malaria area” where the condition is endemic. Other similar cases may have been observed in an area which is endemic to cerebral malaria.

The woman will not usually have taken antimalarial prophylaxis. She may be taking medication that is ineffective against cerebral malaria which is particularly virulent.

There is a history of high fever, rigors, headache, vomiting, lethargy and convulsions.

Pregnant women with severe malaria are particularly prone to hypoglycaemia, pulmonary oedema, anaemia and coma. Cerebral malaria is often rapidly fatal.

Students should be familiar with the symptoms and signs of cerebral malaria and the type of malaria which is prevalent in their area.

If a woman living in a malarial area has fever, headaches or convulsions and malaria cannot be excluded, it is essential to treat the woman for both malaria and eclampsia.

#### Symptoms and signs

- fever
- chills/rigors
- headache
- muscle/joint pain
- coma
- anaemia.

There may also be:

- convulsions
- jaundice.

#### Tests/investigations to confirm diagnosis

Send blood for:

- haemoglobin estimation (to detect anaemia associated with malaria)
- white cell count (elevated in infections)
- malarial parasites.

In cerebral malaria, more than 5 per cent of circulating red cells will be parasited.

#### Important

When malaria is suspected, management with the appropriate antimalarial drug and simple antipyretics should be started immediately without waiting for laboratory results.

## CHECKLIST ✓

### D. Meningitis

#### History

Pneumococcal meningitis can be associated with fits. Coma may precede convulsions, but hypertension is not a common feature. In most cases of meningitis the onset is sudden, though in tubercular meningitis the onset is gradual.

Meningococcal meningitis occurs in epidemics. Therefore there may be a history of other members of the family or community with the illness.

Streptococcal and staphylococcal meningitis are often secondary to other infections. In this case there may be a history or evidence of ear infection (otitis media, mastoiditis) or sinusitis.

#### Symptoms and signs

- fever
- headache
- stiff neck
- photophobia.

There may also be:

- convulsions
- confusion
- drowsiness
- coma.

#### Tests/investigations to confirm diagnosis

The clinical symptoms and signs usually make diagnosis obvious, though it must be distinguished from subarachnoid haemorrhage. The doctor may confirm diagnosis by lumbar puncture. This will show:

- the cerebro-spinal fluid (CSF) is under increased pressure
- the fluid looks cloudy in coccal forms of meningitis but is clear in viral meningitis
- the causal organism is usually found under bacteriological examination and the cell count is increased
- protein is increased, sugar and chlorides decreased.

There are two signs which occur chiefly in cases of meningitis. Emphasize to students that it is much more important to be able to recognize meningitis and refer the woman to a doctor for appropriate management, than to remember the names of the tests.

***Brudzinski's neck sign:***

When the neck is passively flexed (i.e. by the examiner) so that the chin is on the chest, the patient spontaneously flexes her legs.

***Kernig's sign:***

When the patient is lying in the recumbent position, the thigh is flexed as far as possible on the abdomen and an attempt is made to extend the knee joint. Normally the leg can easily be extended, but in meningitis the attempt to extend the knee is resisted. This movement stretches the sacral nerve roots and by extension the meninges, and because the meninges are inflamed, there is pain.

## CHECKLIST ✓

### E. Tetanus

#### History

*Clostridium tetani* may enter the uterine cavity on unclean instruments or hands, particularly during unsafe abortions or unclean deliveries

A woman is considered protected from tetanus when she has received 2 doses of tetanus toxoid at least 4 weeks apart, and with an interval of at least 4 weeks between the last vaccine dose and pregnancy termination (delivery or abortion). Women who have received a vaccination series (5 injections) more than 10 years before the present pregnancy, should be given a booster.

#### Symptoms and signs

- trismus (difficulty opening mouth and chewing).

There may also be:

- spasms of face, neck, and trunk
- arched back
- board-like abdomen
- spontaneous violent spasms.

#### Tests/investigations to confirm diagnosis

Culture of infected tissue.

# CHECKLIST ✓

## F. Puerperal sepsis (septicaemia)

### History

The following are common risk factors:

- poor standards of hygiene
- poor aseptic technique
- manipulations high in the birth canal
- presence of dead tissue in the birth canal (due to prolonged retention of dead fetus, retained fragments of placenta or membranes, shedding of dead tissue from vaginal wall following obstructed labour)
- insertion of unclean hand, instrument or packing into the birth canal (traditional practices should also be examined)
- pre-existing anaemia and malnutrition
- prolonged labour
- prolonged rupture of membranes
- frequent vaginal examinations
- caesarean section and other operative deliveries
- unrepaired vaginal or cervical lacerations
- pre-existing sexually transmitted diseases
- postpartum haemorrhage
- no, or inadequate immunization with tetanus toxoid
- diabetes.

### Symptoms and signs

- fever, temperature 38°C or more
- chills and general malaise
- lower abdominal pain
- tender uterus
- subinvolution
- purulent, foul-smelling lochia.

There may also be:

- light vaginal bleeding
- shock.

### Tests/investigations to confirm diagnosis

- midstream specimen of urine
- wound swab, e.g. perineal or abdominal
- blood culture, in the presence of chills or evidence of severe infection.

### Important

Start broad spectrum antibiotics without delay, while awaiting laboratory results (see Session 5). Septicaemia can develop rapidly and has a high mortality rate.

Why is she having a fit?

### CLINICAL PICTURE (A)

- May have headache, visual disturbance, epigastric pain

- Well-defined stages of fit - but no characteristic warning with which patient is familiar

- Convulsions

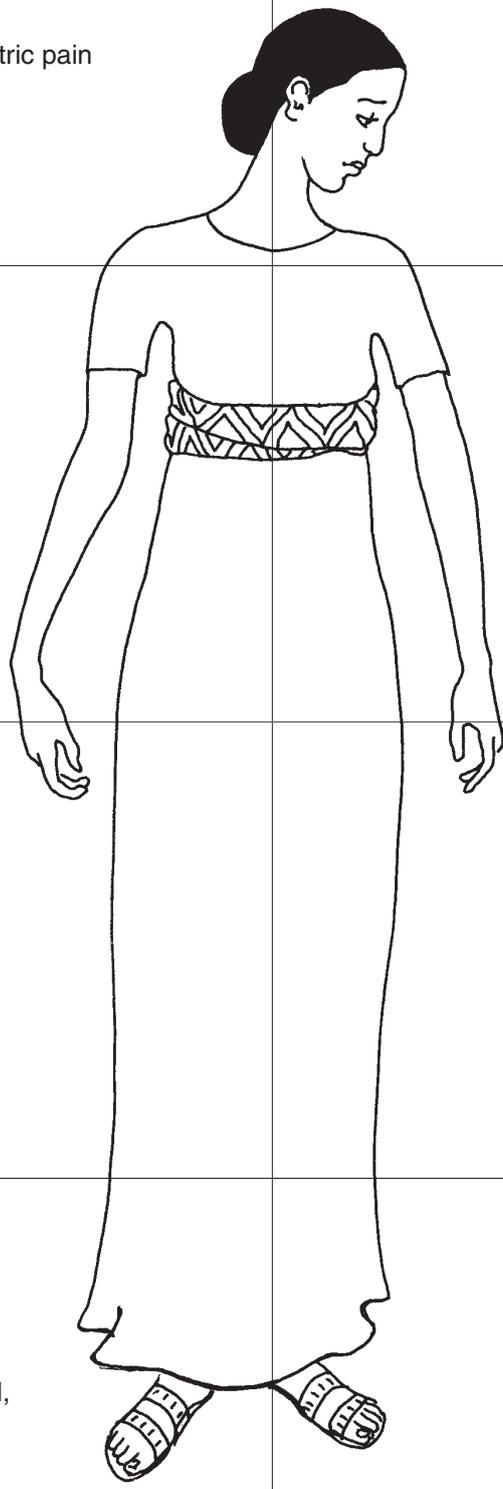
- Diastolic blood 90 mm Hg or more after 20 weeks gestation

- Proteinuria 2+ or more

- May be unconscious

- May pass less than 400 ml, in 24 hours

- May have pulmonary oedema



# ECLAMPSIA

Why is she having a fit?

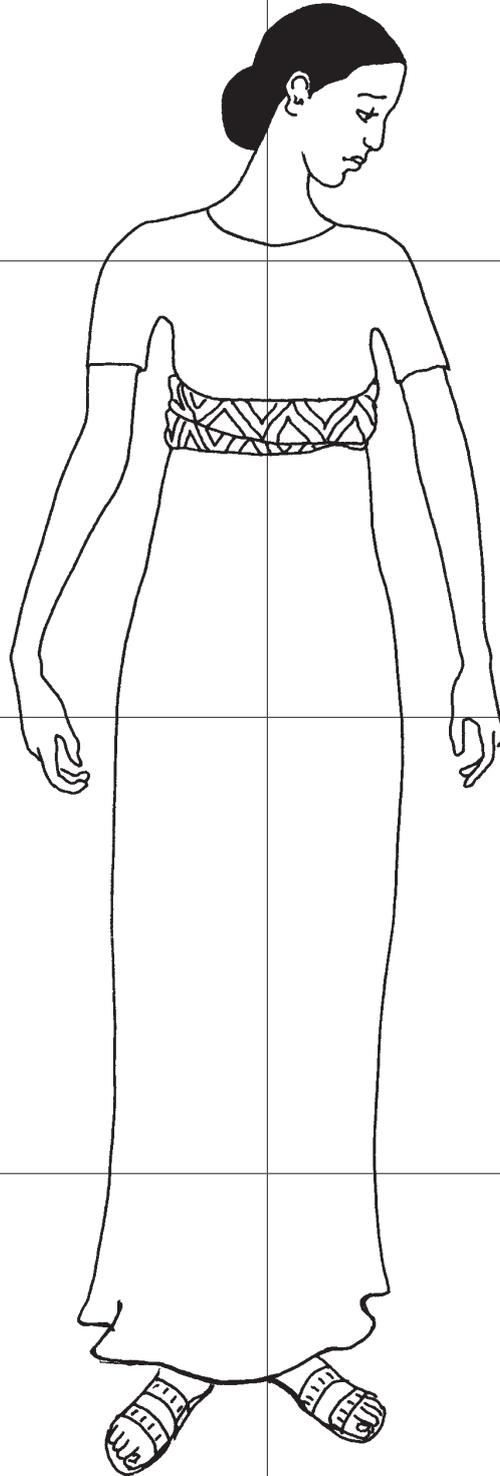
### CLINICAL PICTURE (B)

- Convulsions

- Normal blood pressure

- Falls unconscious often with a cry

- May be characteristic warning before convulsion



WELFELSPY

Why is she having a fit?

### CLINICAL PICTURE (C)

- Fever
- Chills/rigors
- Headache

- Anaemia may be present

- Muscle/joint pain

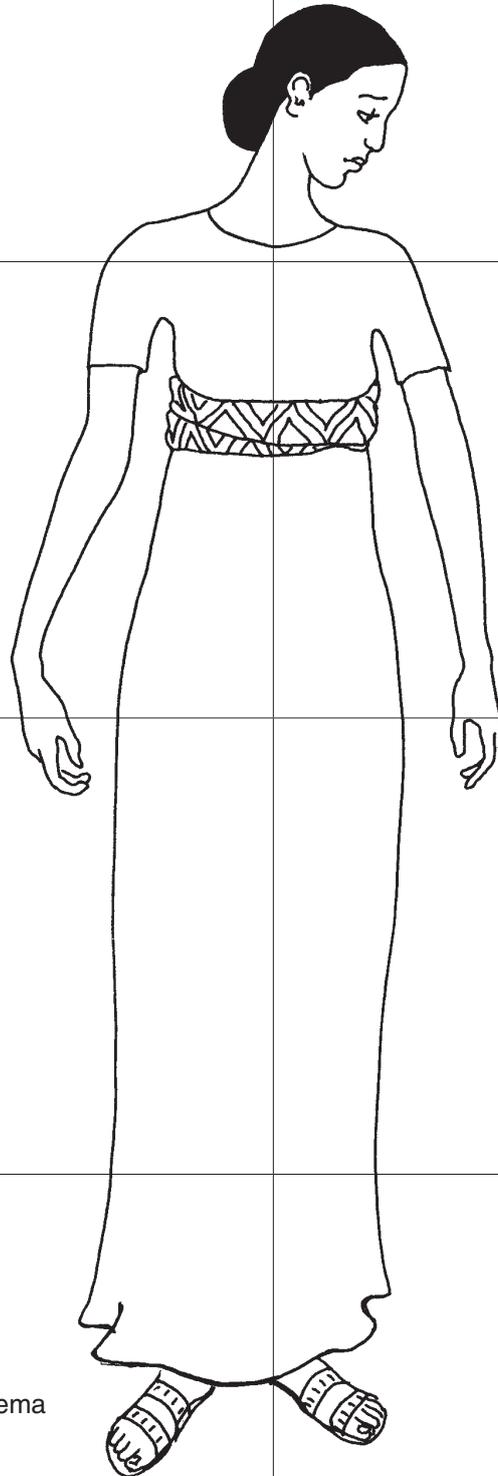
- May have convulsions

- Coma

- May have jaundice

- May have pulmonary oedema

- May pass less than 400 ml, in 24 hours



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Why is she having a fit?

### CLINICAL PICTURE (D)

- Fever
- Headache

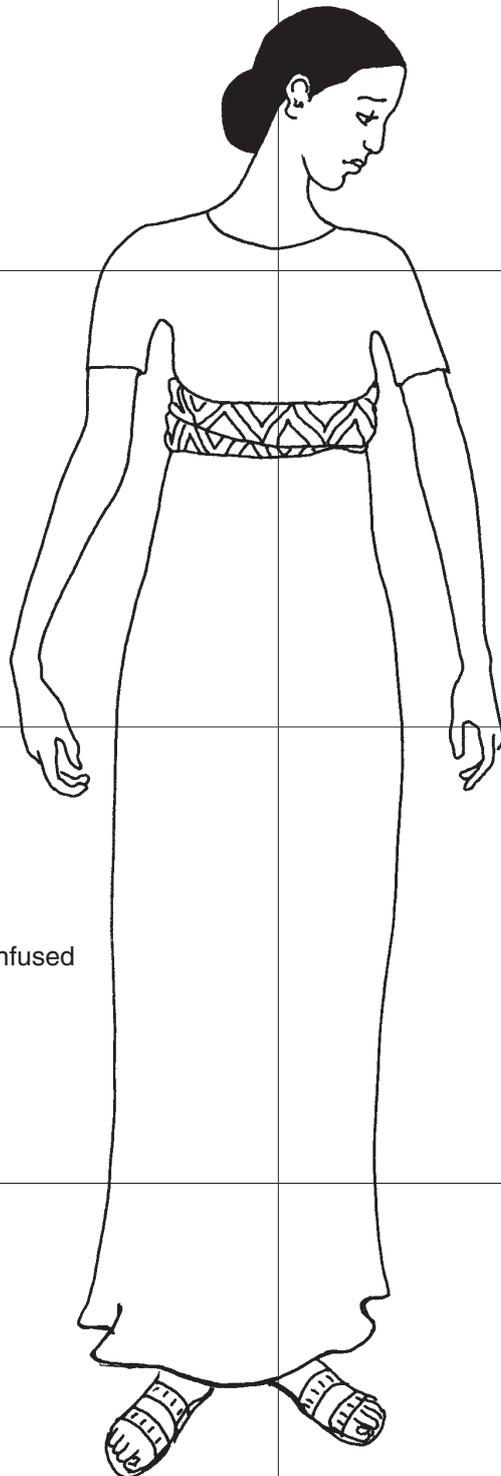
- Stiffness of the neck

- May have convulsions

- Photophobia

- May be drowsy and/or confused

- May be in a coma



# MENINGITIS

Why is she having a fit?

### CLINICAL PICTURE (E)

- Trismus (difficulty opening mouth and chewing)

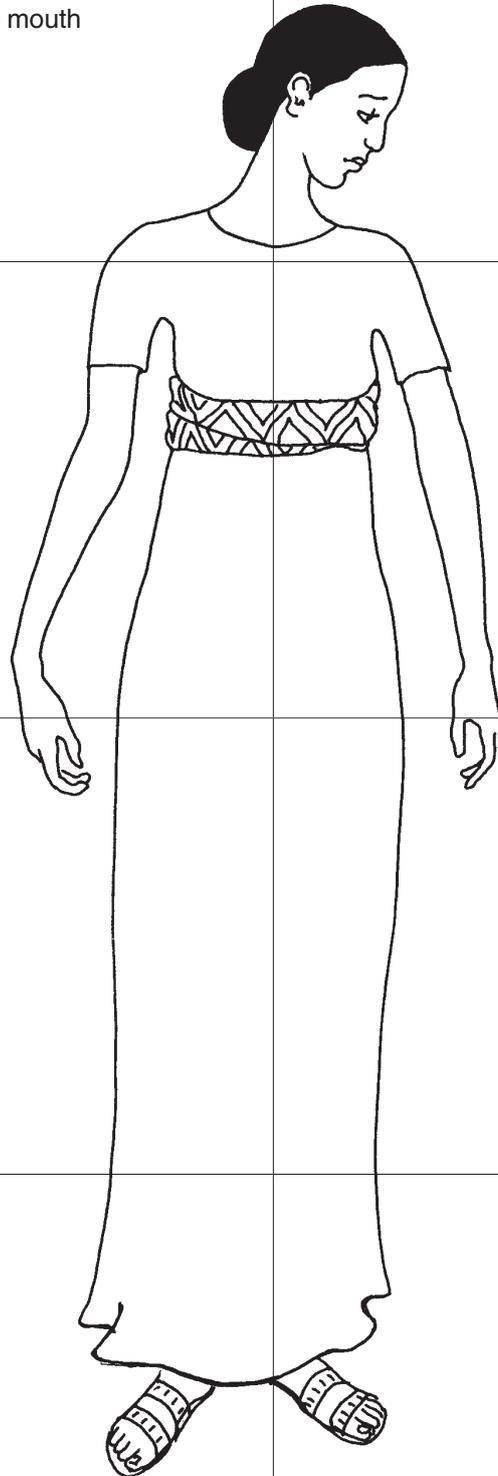
- Spasms of face, neck

- Arched back

- Spasms of trunk

- Board-like abdomen

- Spontaneous violent spasms



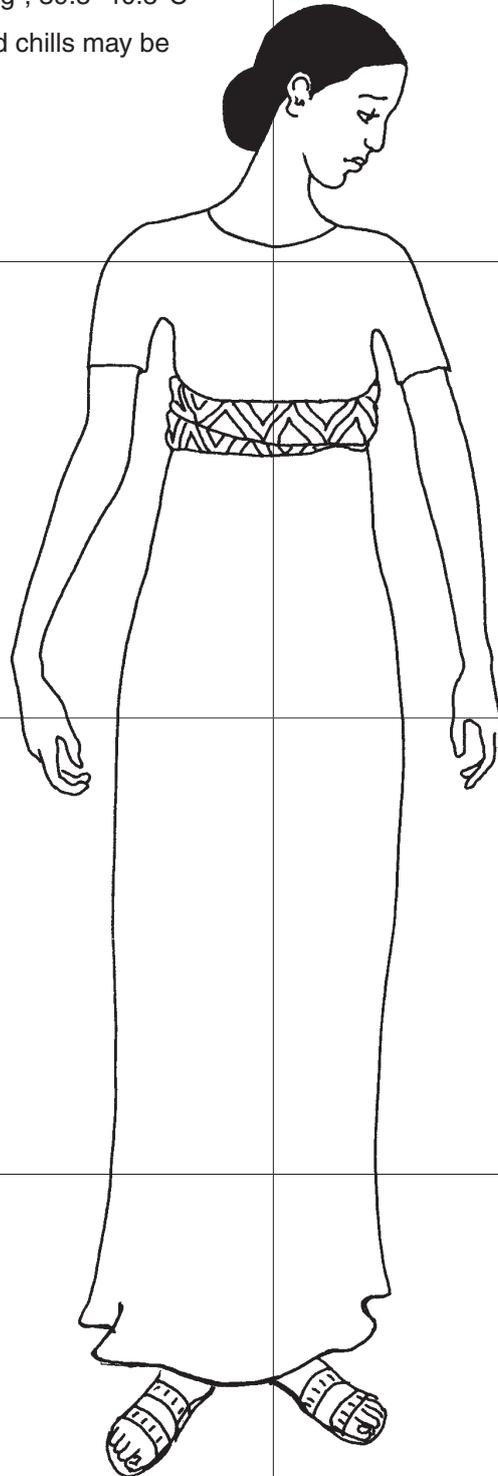
# TETANUS

Why is she having a fit?

### CLINICAL PICTURE (F)

- Fever: temperature “spiking”, 39.5–40.5°C
- At the beginning: fever and chills may be the only sign

- Fast pulse (120 bpm or more)



- Jaundice may develop
- May have abdominal pain

- Heart and lung involvement:
  - pericarditis
  - endocarditis
  - pleurisy
  - pneumonia

- Woman very ill
- Delirium

- In severe infections: joints may become painful and tender

- Coma and fits may occur

# SEPTICAEMIA

# 4

## MANAGING ECLAMPSIA

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## SESSION 4

# MANAGING ECLAMPSIA

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### Aims

- To enable students to understand the management necessary in cases of eclampsia.
- To enable students to initiate management, referring the woman as appropriate.

### Objectives

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

- Explain the principles of management for eclampsia.
- Describe the management of pregnancy-induced hypertension and mild pre-eclampsia.
- Describe the management of severe pre-eclampsia and eclampsia, including the use of anticonvulsive and antihypertensive drugs.
- Outline the problems which may occur after delivery in a woman who has suffered eclamptic fits and describe the management.
- Explain the infection prevention practices applicable to managing eclampsia.

### Plan

Modified lecture.

Discussion.

Total time (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

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

*In this session the problem has already been identified. The woman is suffering from eclampsia. The aim of the management is to save life and prevent further damage. In order to do this, it is essential to select the best management.*

*This session concentrates on steps 4–6.*

### **Principles of management**

*The principles of treating eclampsia are:*

- *speed*
- *skills*
- *priorities.*

### **Speed**

*Students should clearly understand that when a woman has an eclamptic fit (as with any other fit), speed is essential and will influence the outcome, e.g. whether the woman will live or die.*

*Remind students that if the brain is deprived of oxygen, the woman may suffer permanent brain damage.*

*Ask students:*

- *how long can the brain suffer lack of oxygen before it will become permanently damaged? (They should remember that this is only four minutes. They should also know that if the woman is anaemic, she will withstand lack of oxygen less well)*
- *why is a severely anaemic woman at greater risk of damage caused by lack of oxygen (hypoxia)?*

*They should understand that:*

- *the red blood cells carry oxygen around the body*
- *in anaemia there are fewer red cells to carry the oxygen.*

### **Skills**

*This session should be closely linked to the following session on clinical skills. Women's lives and health depend on the clinical skills of midwives.*

### **Priorities**

*Tell students that the priorities for the midwife in managing an eclamptic fit are:*

- *call for medical help*
- *stay with the woman and protect her from injury*

- *position the woman on her left side to reduce the risk of aspiration of secretions, vomit and blood*
- *as soon as possible clear airway and/or give oxygen.*

*Immediately after the fit:*

- *give available emergency drugs to control fits and hypertension*
- *set up intravenous infusion (IVI)*
- *monitor the blood pressure, pulse, respiration, level of consciousness*
- *pass a urinary catheter to monitor urinary output and test for protein.*

*These are priorities. This means they must be done first or 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.*

*Explain to students that admission formalities and more routine parts of midwifery care can be carried out later. Wasting time now means the woman could die. **Remember delay means death.***

*Students must understand that they should identify what must be done in order to save life, and undertake other routine procedures later.*

*Keep at hand any protocol or standing order you may have in your unit, regarding the management of eclampsia. Check this with your medical officer before the session to see whether it needs to be updated.*

*The information students receive in this session is needed before they go into the clinical area in the next session.*

## **MANAGEMENT OF PREGNANCY-INDUCED HYPERTENSION AND MILD PRE-ECLAMPSIA**

In order to detect early signs of pregnancy-induced hypertension and pre-eclampsia, regular antenatal visits are necessary, especially in the third trimester of pregnancy.

At each antenatal visit, the woman's blood pressure must be measured and her urine should be checked for protein if diastolic blood pressure is more than 90mmHg. Pregnant women should be encouraged to come for antenatal care early in their pregnancy so that a baseline value for their blood pressure can be obtained. If there is a rise in blood pressure, the woman should be closely monitored at frequent intervals. If proteinuria develops, she should be admitted to a health facility capable of coping with a woman who may develop eclampsia.

### **Pregnancy-induced hypertension**

The diastolic blood pressure is 90–110 mmHg and there is no proteinuria. The woman is usually managed as an outpatient and followed up weekly at home or at a local clinic.

Management on an outpatient basis at each visit:

- monitor blood pressure, urine (for proteinuria) and fetal condition (growth, movement, heart rate) weekly
- check if the woman has severe headache, visual disturbances or abdominal pain
- counsel the woman and her family about the danger signals of severe pre-eclampsia, ensuring that they know the importance of obtaining immediate medical help if any of the signs develop.

If the blood pressure decreases to normal levels and there are no other complications, the condition has stabilized and the woman should be allowed to proceed with normal labour and childbirth.

If the blood pressure rises, however, and/or proteinuria develops, or there is significant fetal growth restriction (signs of poor fetal growth) or fetal compromise (abnormal fetal heart rate), treat as for pre-eclampsia (see below).

## Mild pre-eclampsia

In mild pre-eclampsia the diastolic blood pressure is between 90–110 mmHg and there is up to 2+ of protein in the urine. Refer the woman to hospital.

### **If gestation is less than 37 weeks:**

If signs remain unchanged or normalize, follow up twice weekly as an outpatient:

- monitor the blood pressure, urine (for proteinuria), reflexes and fetal condition (growth, movement, fetal heart)
- counsel the woman and her family about danger signals of severe pre-eclampsia or eclampsia
- encourage additional periods of rest
- encourage the woman to eat a normal diet (there is no evidence that salt restriction is helpful)
- do not give diuretics, anticonvulsants, antihypertensives, sedatives or tranquillizers.

If management as an outpatient is not possible, admit the woman to hospital:

- provide a normal diet
- monitor the blood pressure, urine (for proteinuria), reflexes and fetal condition (growth, movement, fetal heart)
- do not give anticonvulsants, antihypertensives, sedatives or tranquillizers
- do not give diuretics (they are harmful and are only indicated for use in pre-eclampsia with pulmonary oedema or congestive heart failure).

If **diastolic blood pressure decreases to normal** levels and the woman's **condition remains stable**, send her home:

- advise her to rest and watch for danger signals for severe pre-eclampsia or eclampsia
- see the woman twice a week to monitor blood pressure, urine (for proteinuria) and fetal condition (growth, movement, heart rate) and to assess for symptoms and signs of severe pre-eclampsia
- if diastolic blood pressure increases again, readmit.

If the woman's **signs remain unchanged**, keep her in hospital and continue the same management and monitor fetal growth by symphysis-fundal height:

- if there are **signs of growth restriction**, consider an early delivery; if not continue hospitalization until term.

If **urinary protein level increases**, manage as severe pre-eclampsia (see below).

**If gestation is more than 37 weeks:**

If there are **signs of fetal compromise**, assess the cervix and expedite delivery.

If the **cervix is favourable**, (soft, thin, partly dilated), rupture membranes with an amniotic hook or a Kocher clamp and induce labour using oxytocin or prostaglandins.

If the **cervix is unfavourable** (thick, firm and closed), ripen the cervix using prostaglandins or a Foley catheter or deliver the woman by caesarean section.

## MANAGEMENT OF SEVERE PRE-ECLAMPSIA AND ECLAMPSIA

*Remind students of the main causes of maternal death in eclampsia (see table in Session 1).*

*Remind students that after giving the immediate emergency management it is important to evaluate the outcome and give further management if necessary. This will include referral if the woman is not already in a higher level health facility.*

*When managing a woman with eclampsia, students should bear in mind that the woman may instead be suffering from cerebral malaria, meningitis, or septicaemia (see Session 3).*

Eclamptic fits can begin before, during or within 48 hours of birth. The management is the same in each case. In severe pre-eclampsia, delivery should take place within 24 hours of the onset of the symptoms; in eclampsia delivery should take place earlier, within 12 hours of the onset of convulsions.

The management of eclampsia involves six stages:

1. Making sure the airways are clear and the woman can breathe.
2. Controlling the fits.
3. Controlling the blood pressure.
4. General care and monitoring, including controlling fluid balance.
5. Delivering the baby.
6. Monitoring carefully to prevent further fits and identify complications.

**Management of severe pre-eclampsia includes steps 2–6 above, except that instead of controlling the fits, the aim is to prevent the onset of fits.**

### **1. Making sure the woman can breathe**

This is achieved in four steps:

- Place the woman on her left side to reduce the risk of aspiration of secretions, vomit and blood
- Give oxygen (if available) and continue for five minutes after each fit, or longer if cyanosis persists
- After a convulsion, aspirate the mouth and throat as necessary to clear the airway
- Stay with the woman and ensure that her airway is clear.

### **2. Controlling fits**

Fits are controlled by giving the woman anticonvulsant drugs. The drug of choice for both the prevention and treatment of eclampsia is magnesium sulphate. If magnesium sulphate is not available, diazepam may be given, but there is a greater risk of neonatal depression because diazepam crosses the placenta freely. A single dose of diazepam is unlikely to cause much neonatal depression but, if treatment continues with this drug, the risk of neonatal depression increases and the effect may last for several days.

### **Magnesium sulphate**

#### **Loading dose:**

Give 4g of 20% magnesium sulphate IV slowly over 5 minutes. Magnesium sulphate should not be given as a bolus.

Follow immediately with 10g of 50% magnesium sulphate solution, 5g in each buttock as deep IM injection, with 1 ml of 2% lignocaine in the same syringe. Good aseptic technique is essential when giving IM magnesium sulphate. The woman may have a feeling of warmth during the injection, but this is normal.

If convulsions recur after 15 minutes, give 2g magnesium sulphate (50% solution) IV over 5 minutes.

**Maintenance dose:**

Give 5 g magnesium sulphate (50% solution) together with 1 ml lignocaine 2% in the same syringe every 4 hours into alternate buttocks.

Continue the treatment with magnesium sulphate for 24 hours after delivery or the last convulsion, whichever occurs last.

**Observations which must be made before giving repeat doses of magnesium sulphate:**

- respiratory rate
- patellar reflexes (knee jerk)
- urinary output.

**Complications:**

Repeat doses of magnesium sulphate must be withheld or delayed if:

- the respiratory rate is less than 16 per minute
- patellar reflexes are absent
- urinary output is less than 30 ml per hour over preceding 4 hours.

**Antidote:**

In cases of respiratory arrest:

- give calcium gluconate 1 g (10 ml of 10% solution) IV slowly until respirations satisfactory
- assist ventilation using mask and bag, anaesthetic apparatus or intubation.

*Advantages of magnesium sulphate:*

Magnesium sulphate has been shown in large, multi-centre studies to be more effective than diazepam or phenytoin in preventing or reducing the number of eclamptic fits.

*Disadvantages of magnesium sulphate:*

Magnesium sulphate can cause respiratory depression and arrest.

**Diazepam**

Use only if magnesium sulphate is not available.

**Loading dose:**

Give diazepam 10 mg IV slowly over 2 minutes.  
If convulsions recur, repeat the loading dose.

**Maintenance dose:**

Give diazepam 40 mg in 500 ml IV fluid (Ringer's lactate or normal saline) titrated to keep the woman sedated but able to be roused.

**Complications:**

Maternal depression may occur when the dose exceeds 30 mg in 1 hour. If this occurs:

- Assist ventilation using bag and mask, anaesthetic apparatus or intubation
- **Do not** give more than 100 mg of diazepam in 24 hours.

**Rectal administration of diazepam:**

Give diazepam rectally only when IV access is not possible.

**Loading dose:**

Give 20 mg in a 10 ml syringe (or use a urinary catheter).

Remove the needle, lubricate the barrel and insert the syringe into the rectum to half its length.

Discharge the contents of the syringe and leave the syringe in place, holding the buttocks together for 10 minutes to prevent expulsion of the drug.

If convulsions are not controlled within 10 minutes, administer an additional 10 mg per hour or more, depending on the size of the woman and her clinical response to the drug. Be prepared to assist ventilation.

*Advantages of diazepam:*

Diazepam may be more readily available than magnesium sulphate.

*Disadvantages of diazepam:*

Diazepam can cross the placenta and cause neonatal respiratory depression, difficulties with feeding and in maintaining body temperature.

### 3. Controlling blood pressure\*

**Antihypertensive drugs**

Antihypertensive drugs should be given if the diastolic blood pressure is 110 mmHg or more. The aim is to keep the diastolic blood pressure between 90–100 mmHg to prevent cerebral haemorrhage. Hydralazine is the drug of choice.

**Hydralazine**

Give hydralazine 5 mg IV slowly every 5 minutes until blood pressure is lowered. Repeat hourly as needed or give hydralazine 12.5 mg IM every 2 hours as needed.

If hydralazine is not available, give another antihypertensive drug, e.g. labetalol 10 mg IV. The dose can be doubled to 20 mg, 40 mg and 80 mg, with a 10 minute interval between each increased dose, until a satisfactory response is achieved, i.e. the blood pressure falls

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\* A smooth and sustained reduction in blood pressure over a three-hour period is preferred to a sudden drop.

below 110 mmHg.

*Advantages of hydralazine:*

Hydralazine will reduce the blood pressure quickly when hypertension is severe. It does not cause semiconsciousness and associated problems.

*Disadvantages of hydralazine:*

In the mother hydralazine may cause:

- fast pulse
- nausea and vomiting
- headache
- muscle tremors.

There may also be fetal distress; because of the sudden fall in blood pressure the circulation of blood through the uterus and placenta will be reduced.

#### 4. General care and monitoring

Any stimulus may precipitate a fit, so external stimuli such as noise, bright lights and handling the woman are reduced to a minimum. The woman is nursed in a quiet, single room and must never be left alone, because she could fit at any time and inhale secretions or vomit and/or sustain serious injuries if there is no one in the room to gently restrain her. Anaesthetic instruments, suction apparatus and oxygen equipment must be ready for use by the bedside.

**Only essential care should be given.** This includes:

- turning the woman two-hourly to avoid hypostatic pneumonia
- mouth care, (no oral fluids are given)
- insert a urinary catheter and monitor the urinary output.

**Observations:**

- restlessness or twitching which may herald the onset of another fit
- colour is observed for cyanosis which indicates the need for oxygen
- temperature four-hourly. Hyperpyrexia may occur
- pulse and respirations are recorded hourly, or more often
- blood pressure is recorded at least hourly
- fetal heart is checked hourly
- signs of labour
- fluid balance is recorded accurately.

An indwelling catheter will be inserted and the urinary output is measured hourly and recorded. All necessary fluid is given intravenously, but fluid intake should be restricted because of the risk of overloading the circulation if renal function is impaired by the disease. Renal failure is suspected if the urinary output is less than 30 ml per hour.

Maintenance of proper fluid balance is essential to prevent water intoxication, dehydration, hyponatraemia and pulmonary oedema.

**Diuretics should not be used unless there is evidence of pulmonary oedema.** To diagnose pulmonary oedema, the lung bases are auscultated for rales. Fluids should then be withheld.

**Clotting status** should be assessed with a bedside clotting test. Failure of a clot to form within seven minutes, or a soft clot that breaks down easily, suggests coagulopathy (clotting failure).

## 5. Delivering the baby

Delivery should take place as soon as the woman's condition has stabilized, regardless of gestational age. **In severe pre-eclampsia, delivery should take place within 24 hours of the onset of symptoms. In cases of eclampsia, delivery should occur within 12 hours of the onset of convulsions.**

The medical practitioner will decide on the method of delivery, taking into account the period of gestation and the state of the cervix.

### Assess the cervix

A vaginal examination will be made to assess the state of the cervix.

- If the **cervix is favourable**, (soft, thin, partly dilated), rupture the membranes and induce labour using oxytocin or prostaglandins. Vaginal delivery should be possible
- If the **cervix is unfavourable** (thick, firm, closed), and the fetus is alive, deliver by caesarean section.

### Indications for caesarean section

- Unfavourable cervix
- If there are fetal heart abnormalities, (less than 100, or more than 180 beats per minute)
- If vaginal delivery is not anticipated within 12 hours for eclampsia or 24 hours for severe pre-eclampsia.

Caesarean section should be carried out under general anaesthetic. **Local anaesthesia or ketamine should not be used in women with pre-eclampsia or eclampsia.**

**It is important to ensure that coagulopathy has been excluded before performing a caesarean section.**

### Contraindications for caesarean section

- Unsafe anaesthesia
- Fetus too premature for survival
- Intrauterine fetal death.

## 6. Care after delivery

It is important to realise that fits can occur for the first time after delivery, within the first 48 hours. Fits can also recur after delivery. Therefore the woman must be very carefully observed.

### Points to be noted in providing care

1. Careful observations should be continued, as described above, for at least 48 hours after delivery.
2. Anticonvulsive therapy should be maintained for 24 hours after delivery or the last convulsion, whichever occurs last.
3. Antihypertensive therapy is continued until the diastolic blood pressure decreases to less than 110 mmHg.
4. Continue to care for the woman in a quiet, single room and do not leave her alone.
5. Monitor urinary output very carefully. The woman tends to retain fluid. This is because the kidneys are slow to excrete the extra circulating fluid after delivery. This can cause a rise in blood pressure. Be careful not to give too much fluid intravenously during this period.
6. If after 48 hours there are no fits, the urinary output is good and the diastolic blood pressure is below 110 mmHg, the woman can be transferred to the main ward to recover. Continue four-hourly blood pressure checks for a few days.
7. Arrange for follow up six weeks after delivery.

### Problems and complications

#### Continued fits

If the woman continues to have fits, check that:

- the diagnosis of eclampsia is correct (this means excluding other causes of fits)
- the blood pressure is adequately controlled.

Inform the medical practitioner of the woman's condition.

#### Oliguria

If urinary output is less than 500 ml in 24 hours:

- limit the amount of fluid intake to 500 ml per 24 hours + an amount equal to the amount of urine passed.

If there is no improvement within 48 hours, referral to tertiary level care will be necessary.

#### Blood pressure remains high

Antihypertensive therapy is continued if the diastolic blood pressure remains above 110 mmHg. If the blood pressure remains high, the woman should be referred to a physician who will decide on the long-term management.

**Coagulation failure**

The doctor will consider referral to a haematologist. This may require referral for tertiary level care.

**Persistent coma**

If coma persists for more than 24 hours after a convulsion, referral to tertiary level care will be required.

**Completing the session**

Summarize and ask the students if there are any questions. Remind them of the need for good clinical skills to be able to recognize signs early, and take prompt action. Also remind them of the need to care for the family, who will be extremely distressed to see the woman have a fit; the need for gentleness, so as not to harm the woman if she is unconscious, or stimulate further fits; the need to respect the woman's dignity at all times; the need for strict attention to cleanliness and infection prevention (if infection prevention has not been covered recently, finish the session using the information on the following pages).

## INFECTION PREVENTION INFORMATION

*Infection prevention procedures are critical to the management of any complication in pregnancy and childbirth. Ask students to list the reasons why infection prevention practices are important. Write down their responses on a blackboard or flip chart, which should include the following:*

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

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

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

*Remind students that Universal Precautions are based on the assumption that all blood is potentially infectious, regardless of whether it is from a patient or health care worker. The Precautions aim to reduce, to an absolute minimum, the accidental exposure of patients and health care workers to potentially infectious blood.*

*Continue by reviewing the following infection prevention practices with the class. Depending on the needs and abilities of students, you may wish to demonstrate some of these practices.*

### **Handwashing**

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

Hands should always be washed at the following times:

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

**Before** putting on gloves

**After** handling used (soiled) instruments

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

**After** taking off gloves

**Between** contact with different patients.

### **Glove use**

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

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

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

### **Apron, gown and goggle use**

Plastic or rubber aprons should be worn for protection during procedures where splashing of blood or other body fluids is anticipated. During surgical procedures, where there is a high likelihood of splashing of blood, a fluid-repellent gown or a sterile cloth gown with a plastic apron underneath should be worn.

### **Decontamination of instruments**

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

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

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

- *Instruments and gloves should be rinsed after decontamination*
- *Examination tables and surfaces that may have been contaminated should be wiped clean with a chlorine solution*

- *Suction tubing used with electric aspiration pumps should be flushed with water immediately after use to remove blood and organic material.*

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

### **Cleaning**

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

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

It is important to wash all surfaces of instruments. Small brushes or cloths can be used to scrub items such as specula, forceps and needle holders. However, these should be cleaned after use and regularly replaced as they can be a source of infection transmission. All surfaces of instruments should be cleaned, paying special attention to crevices and joints where blood or tissue can collect.

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

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

### **Sterilization and high-level disinfection**

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

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

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

Boiling is the 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 so it is important to change the solution if it becomes cloudy. Even if the solution does not become cloudy, alcohol solutions should be changed weekly or daily if used heavily; iodophors should be changed daily.

### **Storage of instruments**

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

# 5

## LEARNING CLINICAL SKILLS

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## SESSION 5

# LEARNING CLINICAL SKILLS

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### Aims

- To enable students to gain competence and confidence in using clinical skills which are essential for treating a woman with eclampsia.

### Objectives

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

- Identify risk factors for eclampsia from history, records, and full clinical examination.
- Demonstrate the ability to take blood samples for analysis and discuss the reasons why these may be required in cases of eclampsia.
- Demonstrate the ability to make the appropriate observations on a woman with eclampsia or severe pre-eclampsia, understand the significance of the findings and take appropriate action.
- Demonstrate the ability to provide appropriate care for a woman during and after an eclamptic fit.
- Demonstrate the ability to set up and monitor an intravenous infusion, stating the reasons for doing so, the precautions to be taken and the records to be kept.\*
- Explain the prescription, ordering, storage, administration and side-effects of drugs used for the management of eclampsia, and demonstrate the ability to administer the necessary drugs correctly.\*
- Demonstrate the ability to insert a self-retaining catheter and monitor urinary outputs.
- Explain the risk of thromboembolic complications when a pregnant or newly delivered woman is confined to bed and demonstrate how the risk can be minimized.\*
- Demonstrate the ability to maintain accurate records.

### Plan

Modified lecture (2 hours).

Clinical teaching, discussion (½ hour–1 hour per small group of students, as well as a realistic period of time for assessment of competence in each skill).

### Resources

*Detecting pre-eclampsia: a practical guide.* Geneva, World Health Organization, 1992 (WHO/MCH/MSM/92.3).

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

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\* These objectives may already have been achieved by students who have completed the postpartum haemorrhage module, prolonged obstructed labour module or the puerperal sepsis module.

## INTRODUCTION

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*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 midwives or obstetricians. Whilst learning these skills, students should be provided with consistent 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 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 checklists could then be used for each student being assessed.*

*Remind students that the infection prevention practices described with respect to managing eclampsia (Session 4) apply to the skills in this session.*

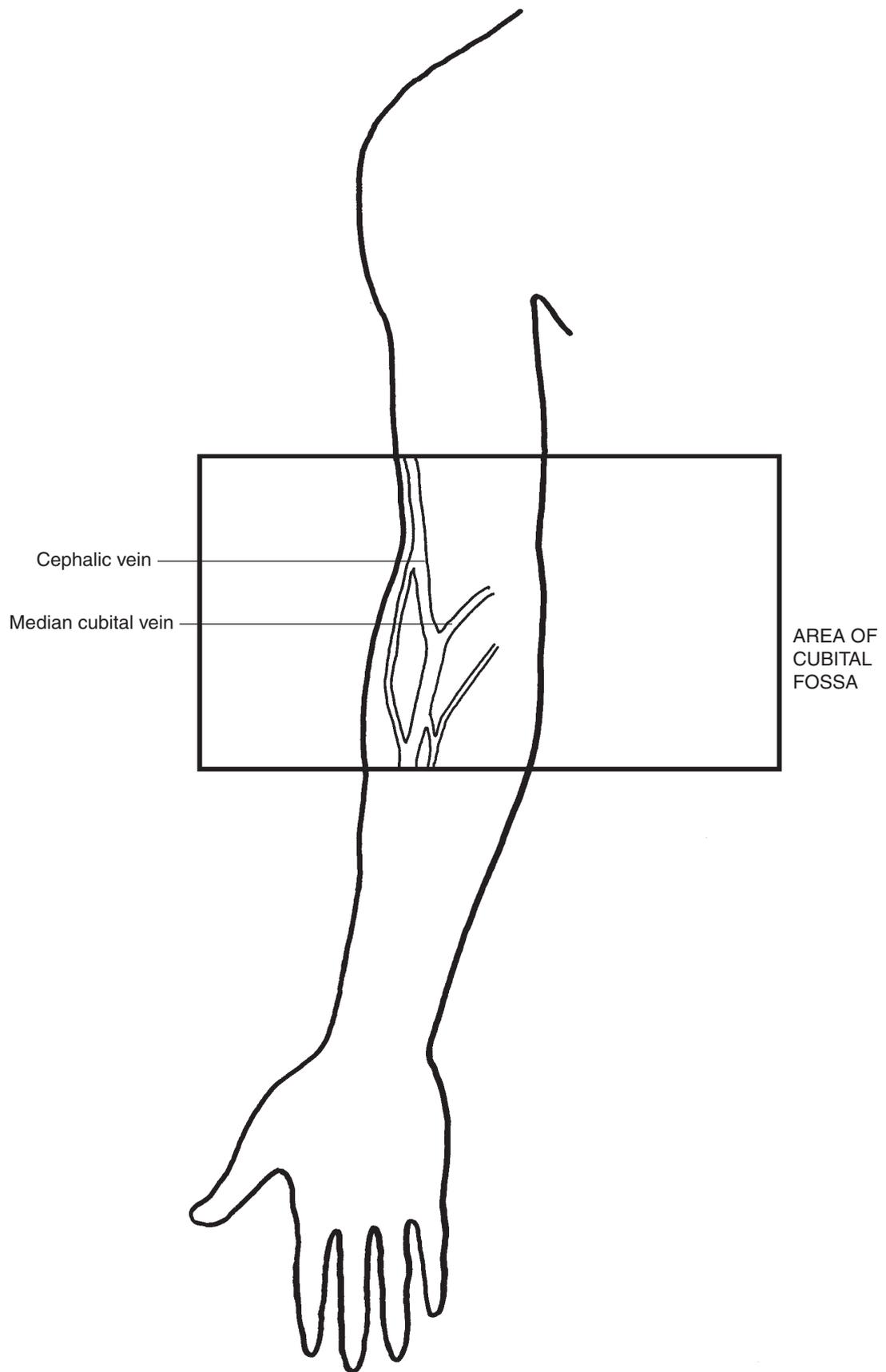
### **SKILL: IDENTIFY RISK FACTORS FOR ECLAMPSIA; DIAGNOSE PRE-ECLAMPSIA AND ECLAMPSIA**

*This skill has been taught in Session 3.*

#### **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 listed in Checklist A, Session 2:*
  - *from the written records?*
  - *from her/his own history taking?*
  - *from clinical examination?*
  
2. *Is the student able to diagnose pre-eclampsia and eclampsia:*
  - *from the written records?*
  - *from her/his own history taking?*
  - *from clinical examination?*



**Figure 5.1** Important veins of the cubital fossa (right arm)

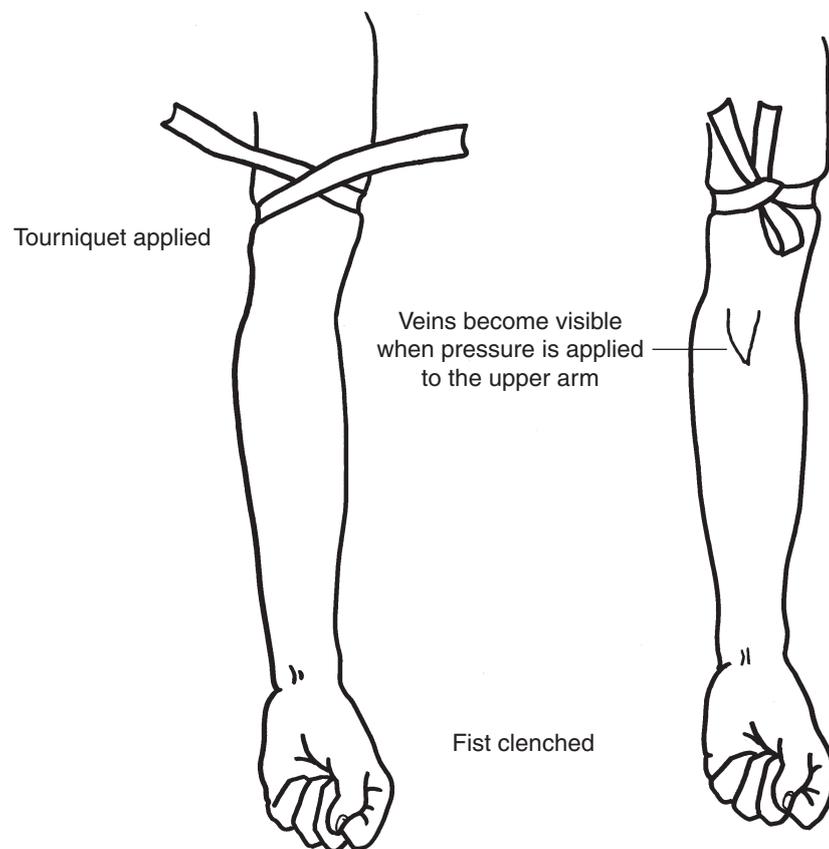
## SKILL: TAKING BLOOD SAMPLES FOR ANALYSIS

### 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 5.1).*

*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 5.2).*

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



**Figure 5.2** Applying a tourniquet to find a vein

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

*The blood tests covered in the teaching session should include haemoglobin, grouping and cross-matching.*

*Students should realize that women with pre-eclampsia or eclampsia are at increased risk of postpartum haemorrhage as the condition is associated with complicated coagulopathy. It is therefore wise to take blood haemoglobin for grouping and cross-matching.*

*Other biochemical tests that may be carried out are as follows:*

*Coagulation studies:*

- *platelet count*
- *coagulation time.*

*A bedside clotting test can be carried out by taking 2 ml of blood and putting it into a clean, plain glass test tube. The test tube is held in a closed fist to keep it warm. After 4 minutes tip the tube slowly to see if a clot is forming. Then tip it again every minute until the blood clots and the tube can be turned upside down. Failure of a clot to form after 7 minutes or a soft clot that breaks down easily suggests coagulopathy (coagulation failure).*

*Assessment of renal function:*

- *plasma electrolytes*
- *blood urea*
- *creatinine and uric acid.*

*Assessment of liver function:*

- *liver enzymes*
- *liver function tests.*

*It may be helpful to ask medical and/or laboratory staff to explain the tests which are done in the local laboratory.*

## **Teaching content**

Teaching should cover the following points:

1. Understanding the reasons for specific blood tests.
2. Preparation of all equipment, including:
  - syringes, needles and correct test tubes for each specimen of blood which should be clearly labelled with the woman's name, number, ward, investigation required, date and time of collection of blood
  - swabs for cleaning the puncture site and elastoplast for covering it when the blood has been taken
  - correct laboratory request forms accurately completed
  - tourniquet or assistant to compress the upper part of the arm.

3. Comfortable position of the woman with arm extended and supported.
4. Explain to the woman what you are doing, and why.
5. In applying a tourniquet, stress:
  - placing of tourniquet at mid-biceps level well above the elbow joint (as in **Figure 5.2**)
  - correct pressure to compress blood vessels and restrict circulation without causing excessive pressure and pinching the skin.
6. Correct site for venepuncture.
7. Sterile technique: cleaning the site with antiseptic solution, use of sterile needle.
8. Precautions against injuries and infectious diseases (e.g. HIV, hepatitis) e.g. handwashing, use of gloves, avoidance of needlestick injuries, correct disposal of needles.
9. Blood specimens should be sent promptly to the laboratory after collection.

### 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 in obtaining blood specimens correct?*
3. *Does the student protect the woman, him/herself and any assistant(s) from contamination with blood and possible infection?*
4. *Does the student select appropriate test-tubes to transport the specimens to the laboratory, and send them without delay with the correct and completed 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 safely dispose of used syringes and needles?*

## SKILL: MIDWIFERY OBSERVATIONS

### Teaching method

*Students can practise taking each other's blood pressure, temperature, pulse and respiration, which makes it easy to check for accuracy. They can then practise the skills in the clinical area. Urine testing for protein may also be practised in a classroom situation before taking the students to the clinical areas. A small amount of the white of an egg can be added to a number of specimens of urine so that they will test positive for protein.*

### Teaching content

When providing care for women with pre-eclampsia and eclampsia, students should understand the importance of accurately recording the blood pressure and testing the urine for protein.

### Measuring blood pressure

Important points to remember are:

Remove all tight clothes from around the arm. Tight clothes may partially block the artery and give a false low reading.

Wrap the cuff firmly around the upper arm. The cuff must be at least 2–3 cm (1 inch) above the elbow and should encircle at least three–fourths of the circumference of the arm, otherwise a false high reading will be obtained.

A wider cuff should be used when the diameter of the upper arm is more than 30 cm.

Make sure that the woman is as relaxed and comfortable as possible, in a sitting position with arm supported or lying tilted to the left side. Lying on the back is not a good position because the weight of the gravid uterus exerts pressure on the inferior vena cava, thereby causing a drop in blood pressure.

Do not kink or twist the tube on the cuff. Make sure that the stethoscope fits into your ears firmly and snugly. If a mercury blood pressure machine is used, it must be in the vertical position, and your eyes must be approximately at the same level as the top of the mercury column or the reading will not be accurate.

Systolic blood pressure is taken at the point at which the arterial sound appears.

Diastolic blood pressure is taken at the point at which the arterial sound disappears.

### Detecting proteinuria

Proteinuria is defined as the presence of 300 mg or more of protein per litre in a clean catch, midstream specimen of urine. Usually proteinuria follows a rise in blood pressure, but occasionally it is the first sign of the disease.

Vaginal secretions and discharges are common in pregnancy and, if mixed with urine, give a positive test for protein. To avoid this, it is important that:

- The vulva is cleaned with water
- The labia minor is spread
- While urine is being passed, the middle part of the stream is caught in a clean container.

*Dipstick method:*

- The end of the stick is dipped into the urine and excess shaken off by tapping the stick on the side of the container
- The result is then read by comparison with the colour chart on the label at the time indicated on the dipstick container.

*Boiling method:*

- Boil the top half of the urine in a test tube
- Compare the top half of the urine with the unboiled bottom half (the boiled part may become cloudy)
- Add 1–2 drops of 2–3% acetic acid. Do this even if the urine has not become cloudy
- If, after adding the acetic acid, the boiled part of the urine remains cloudy, protein is present in the urine
- If the boiled urine was not cloudy to begin with, but becomes cloudy when acetic acid is added, this is another indication that protein is present
- If cloudy urine becomes clear when acetic acid is added, protein is not present.

## **Detecting oedema**

Oedema is not a reliable sign of hypertensive disorders of pregnancy.

## **Assessing competence**

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

1. *Can the student accurately explain the reasons for making each of the observations and for recording the findings?*
2. *Can the student take temperature, pulse and respiration correctly?*
3. *Can the student take blood pressure and correctly interpret the findings?*
4. *Can the student correctly test urine for protein, and understand the significance of proteinuria in pregnancy?*
5. *Does the student give the woman correct and clear instructions for the collection of a clean-catch, midstream specimen of urine for testing?*

6. *Can the student state possible reasons for proteinuria?*
7. *Can the student record observations correctly on a chart (including fluid balance charts)?*
8. *Does the student know the range of normal for:*
  - *temperature*
  - *pulse*
  - *respiration*
  - *blood pressure*
  - *normal urinary output?*
9. *Can the student correlate all the findings of her/his observations, make an accurate judgement of the woman's condition and take any necessary appropriate and timely action?*
10. *Can the student explain the findings of her/his observations to the mother and answer her questions?*
11. *Does the student inform a doctor or take steps to transfer the woman for medical advice/management when there is a risk of eclampsia?*
12. *Can the student explain why it is necessary to control the fits and the blood pressure before moving the patient?*

## **SKILL: CARE AND OBSERVATION DURING AND AFTER A FIT**

### **Teaching method**

*This subject has been introduced in the classroom in Session 4. The teacher should make sure that students can apply the knowledge in practice. They should do this in their own clinical area.*

### **Teaching content**

Students should be able to prepare a room for caring for a woman with eclampsia or severe pre-eclampsia. The room should be quiet and the midwife must work and speak quietly. Cotton wool plugs in the woman's ears may help to exclude noise. There must be enough light in the room for observation of changes in the woman's condition.\* The eclamptic woman is not disturbed by ordinary light nearly so much as by noise. All the equipment needed must be in the room and ready for use: oxygen and face mask, suction apparatus, anaesthetic tray, intravenous pack, self-retaining catheter and bag for urine, the necessary drugs, syringes and needles, emergency supplies for delivery and resuscitation of the baby, basin for vomit, sphygmomanometer, clinical thermometer and charts.

Students should be able to give emergency care **during a fit**.

\* There should be enough light to see whether the woman is cyanosed.

- The woman should never be left alone
- The woman should be placed on her left side to reduce the risk of aspiration of secretions, vomit and blood during a fit
- The woman should be protected from injury during a fit, but not forcibly restrained
- After a fit, the mouth and throat should be aspirated
- Give oxygen 4–6 L per minute after a fit for 5–10 minutes, longer if still cyanosed
- Anticonvulsive drugs should be given as soon as possible, as described in Session 4.

Students should be able to care for a woman after a fit. Refer to “Making sure the woman can breathe” (Session 4). The student must remember that no fluid should be given by mouth because of the danger of inhalation into the lungs.

Students should be able to make and record observations of the woman and know their significance.

- Blood pressure should be taken hourly. A rise in blood pressure denotes a worsening of the woman’s condition. A fall in blood pressure indicates the woman is improving and this often means that the fetus has died. If the fall in blood pressure is accompanied by cyanosis and cold extremities, this may indicate heart failure
- The pulse, respirations and the temperature should be checked hourly. The temperature may rise to 38.8°C after a succession of fits or if respiratory infection is present. Slow respirations (below 12) may be due to cerebral haemorrhage; rapid respirations associated with a rising temperature and pulse may indicate lung infection
- The colour of the woman may be bluish or dusky due to cyanosis. This indicates asphyxia or heart failure. A yellowish colour could mean liver damage
- The level of consciousness of the woman should be noted
- The time and length of a fit should be recorded. Any signs of twitching or restlessness which may indicate that a fit is about to occur should be identified and more anticonvulsives given, if appropriate
- If the woman has not delivered, the fetal heart rate should be taken every hour, and signs of labour, such as contractions, cervical dilatation or any loss of fluid from the vagina should be noted. The student must realize that a comatosed or sedated woman can go into advanced labour and that these signs must be noted by the midwife.

Students should be able to refer to a higher level health facility, when needed. If the midwife is working in the community or health centre, she should know when to refer a pre-eclamptic or eclamptic woman. Before referral, however, it is important to try and stabilize the woman’s condition by giving anticonvulsants, antihypertensives if available and indicated, establishing an intravenous infusion and

to insert a urinary catheter. A midwife or other competent health care worker should accompany the woman during referral, to monitor and manage her condition, as necessary. All the necessary drugs and equipment which may be needed during the journey should be carried with them.

## 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 importance of:*

- *having a quiet room?\**
- *having equipment ready for use?*
- *having a nurse/midwife in constant attendance?*

2. *Can the student:*

- *place a woman in the left lateral position?*
- *prepare a suitable room?*
- *prepare equipment?*

*(Equipment should include use of suction and use of oxygen. All apparatus should be in good working order and ready for use).*

3. *Can the student identify the drugs which may be prescribed for a woman with eclampsia? Does she/he know:*

- *the correct doses?*
- *the action and side effects?*
- *the route for administration?*

4. *Can the student demonstrate the actions she/he would take if a woman has an eclamptic fit?*

5. *Can the student demonstrate the observations necessary, interpret the significance of her/his findings, take appropriate action and indicate the records which must be kept? Observations must include temperature, pulse and respiration, blood pressure as well as details of fits, such as:*

- *time of fit*
- *length of fit*
- *colour (noting any cyanosis)*
- *level of consciousness*
- *fetal heart rate*
- *signs of labour.*

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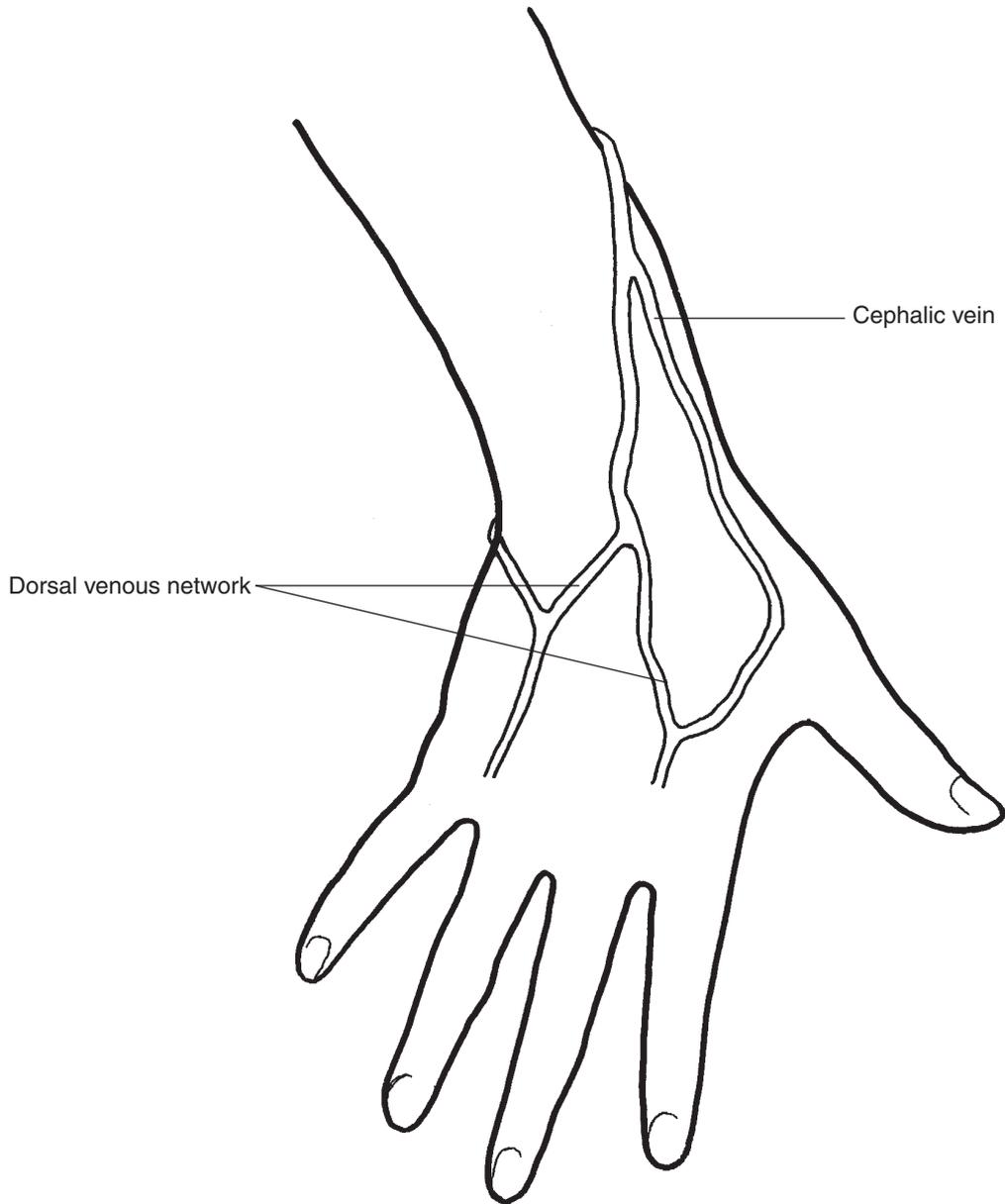
\* There should be enough light to see whether the woman is cyanosed.

6. Can the student clearly state indications for calling a skilled medical practitioner or for transfer of the woman to a higher level health facility?

**SKILL: SET UP AND MONITOR INTRAVENOUS INFUSION**

**Teaching method**

Students should be familiar with the anatomical location of the veins of the forearm which are used for IVI. Avoid using veins near a joint. The forearm or back of the hand are best (**Figure 5.1**, and **Figure 5.3**).



**Figure 5.3** Important veins of the forearm and back of the hand

*Encourage students to trace the course of the veins on their own arms. This is made easier if pressure is applied to the upper arm to constrict the circulation while the arm is extended (as in **Figure 5.2**).*

*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 advisable to help students learn this skill first in a clinical situation which is not extremely urgent.*

## Teaching content

Teaching should cover the following points:

1. Identifying the need for IVI: when body fluid is lost because of bleeding, infection, dehydration or shock, to administer drugs quickly (as in the case of eclampsia).
2. Preparation of all equipment, including:
  - sterile intravenous tubing
  - selection of a large (No. 18) needle or cannula
  - selection of appropriate fluid
  - running IVI fluid through the tubing to make sure there is no air in the tubing
  - sticky tape, already cut into strips
  - drip stand or appropriate wall fixture (e.g. a nail into the wall will suffice)
  - rubber tourniquet
  - armboard 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. Clean technique: wash your hands with soap and water, clean the site of infusion with clean swabs (use gloves to protect yourself against injuries or transmissible infectious diseases, e.g. HIV, hepatitis).
6. If a midwife does not succeed in putting up an IVI after two or, at the most, three attempts, she/he 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. Use of fluid balance charts, monitoring blood loss, pulse, blood pressure, and urinary output.
9. Complications of intravenous infusions:

**local problems:**

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

**generalized problems:**

- septicaemia (infection of the blood. This can be prevented by using sterile needles, tubing and intravenous fluids and ensuring a good aseptic technique
- circulatory overload; giving too much intravenous fluid too fast can cause heart failure and the lungs may fill up with fluid. This is a particular problem in women with eclampsia when there is renal damage and urinary output is diminished. 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 circulating fluid.

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

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

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

**Table 1: IV Fluid Rates**

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

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

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

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

## 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 according to priorities?*
3. *Does the student protect the woman, him/herself 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 the signs that indicate improvement and deterioration?*
6. *Does the student explain the procedure to the woman and/or her relatives?*
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: ADMINISTERING NECESSARY DRUGS

### Teaching method

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

- *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

The student must understand the reasons for the administration of different drugs to control eclampsia. These are:

- to control the fits
- to control the blood pressure.

Refer to Session 4 of this module.

Make sure that students are familiar with the drugs that are available for use in the areas where they work.

### 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 for the treatment of severe pre-eclampsia and eclampsia 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 as a matter of urgency.

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 each dose is 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 patient.

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 drugs.

1. Midwives must be skilled in the administration of IV injections.
2. The drug 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 closely 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 anticonvulsants and antihypertensive drugs for use?*
2. *Does the student know the correct doses of all the drugs which she/he needs to use – whether IV, IM or oral?*
3. *Does the student know the side-effects of the drugs given for eclampsia, make appropriate observations to detect them and, where necessary, take appropriate action?*
4. *Can the student demonstrate her/his understanding of the importance of:*
  - *noting the expiry date of drugs and not using them beyond that date?*
  - *proper storage of drugs?*
  - *adequate stocks of drugs?*

5. *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 patient?*
6. *Does the student administer the drug carefully, accurately and safely?*
7. *Does the student note all drugs given, accurately and fully in the woman's records.*

## **SKILL: INSERT A SELF-RETAINING CATHETER AND MONITOR OUTPUT**

### **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 care of an eclamptic woman 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**

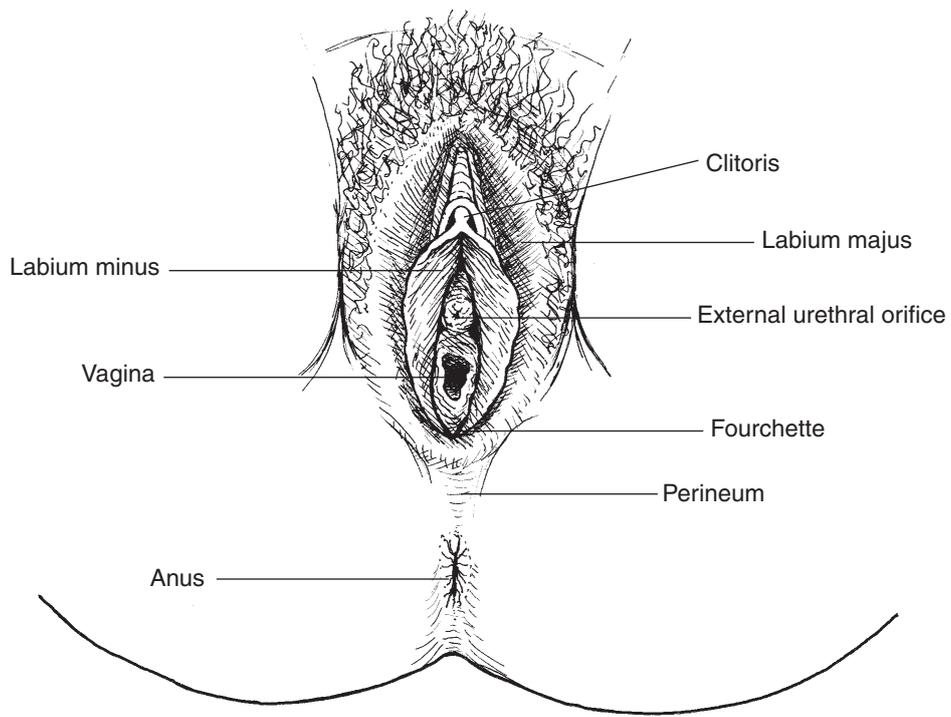
*If you feel the students need to be re-familiarized with the main landmarks of the female external genital organs, use **Figure 5.4**.*

#### **Procedure**

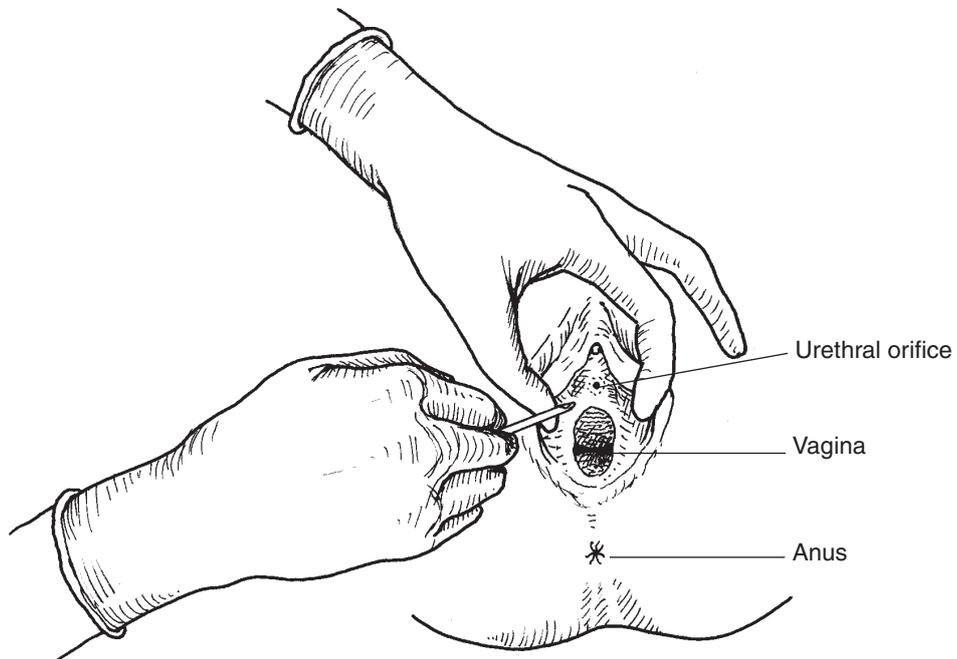
Clean the genital area with clean water. Wash and scrub hands thoroughly and put on sterile gloves. Separate the labia with the fingers of the left hand and gently insert the catheter into the urethral orifice using the right hand (**Figure 5.5**). If difficulty is encountered while introducing the catheter, the sterile gloved forefinger of the left hand should be inserted into the vagina and placed along its anterior wall. The tip of the catheter can then be felt, and if it is directed parallel with the finger in the vagina, the catheter will enter the bladder without injury to the urethra. If the catheter is obstructed by the fetal head, upward pressure on the head by the finger in the vagina will assist passage of the catheter.

Emphasize the need for:

- aseptic technique to avoid infection
- accuracy and skill in the procedure
- gentle handling to avoid injury to the urethra
- sensitive approach
- accuracy in monitoring the urine output in relation to the management of eclampsia.



**Figure 5.4:** Female external genital organs



**Figure 5.5:** Urinary catheterization separating the labia and introducing the catheter into the urethral orifice

## Complications

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

## Indications for catheterization

Urinary catheterization should only be done when absolutely necessary because of the associated risk of infection, and 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, the woman is unable to void on her own, or accurate measurement of urinary output is required, as in cases of eclampsia.

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

Students may have practised this skill in previous modules. It is important here to emphasize that:

- a self-retaining catheter must be used
- a continuous drainage system should be attached
- the urine should be measured every four hours
- intake and output must be recorded
- each specimen of urine must be tested for protein.

## 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 explain why a self-retaining catheter must be used in caring for a woman with eclampsia?*
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 measure the urinary output, record fluid intake and output correctly, test the urine for protein and explain the significance of her/his findings?

## SKILL: PREVENTING THROMBOEMBOLIC DISORDER

### Teaching method

*If possible most of this teaching should be done at the bedside. Discuss the relevant physiological changes during pregnancy and the puerperium. These include the increased clotting tendency of the blood and the increased venous stasis. This is increased in women with eclampsia who are immobile until the condition improves.*

### Teaching content

*Students may be familiar with thromboembolic disorder from their general nursing, but they need to recognize the added risks to the woman who has recently delivered and has to rest in bed because she is eclamptic.*

*Students should be familiar with definitions and risk factors.*

### Definitions

- **Thrombosis:** a blood clot in a blood vessel
- **Embolus:** a foreign body (usually a clot of blood or amniotic fluid) which moves and blocks a blood vessel
- **Embolism:** the sudden blocking of a blood vessel by an embolus
- **Pulmonary embolism:** the pulmonary circulation (i.e. the circulation to the lungs) is blocked by an embolus.

### Risk factors

These include:

- age over 35 years
- high parity
- obesity
- caesarean section
- trauma to legs (consider use of lithotomy poles)
- lying in bed
- dehydration
- smoking
- history of oestrogen intake (e.g. oral contraceptives).

### Symptoms and signs

Superficial thrombophlebitis: superficial veins of legs look red, feel hard and are tender. The woman may have fever.

Deep vein thrombosis: there is pain and swelling of the leg, and the pain is increased on walking. There is a risk of pulmonary embolism.

Pulmonary embolism is a very serious problem which can lead to maternal death. Everything possible must be done to prevent this complication.

The woman will be at increased risk of emboli when she is ill, because of her need to rest in bed.

## Prevention

Prevention of thromboembolic disorder is by active movement and passive movement.

Active movement is when the woman moves herself.

Passive movement is when the woman is moved by the midwife or nurse because she is unable to move herself.

The use of elastic support stockings may also help to reduce the incidence of thromboembolic disorders, especially for women confined to bed.

It is the responsibility of the midwifery personnel to encourage active movement and provide passive movement. During the acute phase of illness, passive movement should involve changing the position of the woman at regular intervals. As her condition improves, passive movement of the limbs should be carried out at regular intervals.

## 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 risks of thromboembolic disorder to a postnatal mother with eclampsia?*
- 2. Does the student understand the increased risk when the woman is ill and confined to bed?*
- 3. Does the student understand her/his responsibility in preventing thromboembolic disorder?*
- 4. Does the student encourage the woman to move around in bed and to get up as soon as possible?*
- 5. Where necessary, does the student frequently carry out passive exercises of the limbs, and does she/he do this very gently?*
- 6. Can the student describe the symptoms and signs of deep vein thrombosis, and superficial thrombophlebitis?*
- 7. Can the student carry out an examination of the woman in order to detect risk factors?*
- 8. Can the student carry out an examination of the woman in order to detect early signs of superficial and deep vein thrombosis?*
- 9. Can the student explain the dangers of pulmonary embolism?*

10. Does the student understand that preventing deep vein thrombosis can help to prevent pulmonary embolism?

## **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 make the other person feel threatened.*

### **Teaching content**

*The students may already be familiar with the principles of maintaining records from earlier in their programme, or during their initial pre-service programme (if this is part of a post-basic training programme). They need to recognize the special requirements of record keeping in midwifery and the special needs of the woman who has recently delivered.*

*Remind students about the importance of record keeping. Stress that it must be:*

- *clear*
- *legible*
- *accurate.*

*and must include:*

- *dates*
- *times*
- *signatures.*

*Discuss the importance of balance in record keeping. A midwife should write:*

- *enough to give a clear account of the woman's condition/the event*
- *not too much that it takes up valuable time when the midwife needs to care for the woman.*

***This is very important.***

## **Purposes of record keeping**

*Ask the students to form discussion groups and consider the question “What is the purpose 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 English or into another language with which they are familiar).*

## **Assessing competence**

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

- 1. Does the student understand the principles and purpose of record keeping?*
- 2. Are the student’s own records easy to understand and use? Are they clear, legible and the right length?*
- 3. Can the student explain the legal/statutory requirements which refer to record keeping by midwives?*



# 6

## CASE STUDIES

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## SESSION 6

### CASE STUDIES

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#### Aims

- To enable students to reflect on practice and realize the important link between process and outcome in respect of managing pre-eclampsia or eclampsia.
- To enable students to learn from their experience and to make practical recommendations which will improve the outcome when managing pre-eclampsia or eclampsia.

#### Objectives

On completion of Session 6, 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 the important points of practice in the prevention and management of eclampsia.
- Discuss how other women may also benefit from aspects of care which contributed to a safe outcome or lessons learned from a poor outcome.
- Describe how improved maternity care can influence the outcome of the management of eclampsia and pre-eclampsia, giving examples from experience.
- Explain the importance of reflecting on practice in order to evaluate and improve care.

#### Plan

Case studies.

Discussion.

Group work.

Total time: 3 hours.

Optional tutorial (1 hour per student or small group of students).

#### Resources

Instructions for Students: guidelines for case study.

Instructions for Group Work.

## INTRODUCTION

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*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 this session, and should include clinical teaching.*

*Divide the students into small groups: each group will prepare and present one case study. Give the students the Guidelines for Case Study, provided at the end of the session. To obtain the needed information students should use case records which the teacher has selected from the clinical area.*

*Three case studies for presentation by students have been suggested for this session. However, the teacher may decide to use only two as part of a shorter session, and repeat the session later using the third case study.*

*If possible, it would be appropriate to use at least one case study where the outcome was good, and another where it was not so good and compare the reasons why this was so. Include cases of both pre-eclampsia and eclampsia.*

*Ensure the students have sufficient time to prepare the case study they are presenting.*

## OUTLINE OF THE SESSION

1. *Introduction to the session. Remind the 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 make pregnancy safer*

*Introduce the students who will present case studies.*

2. *Presentation of case study 1.*

3. *Opportunity for question and answer about case study 1.*

4. *Presentation of case study 2.*

5. *Opportunity for question and answer about case study 2.*

6. *Presentation of case study 3.*

7. *Opportunity for question and answer about case study 3.*
8. *Summary of case presentations. Here it is very important:*
  - *to relate process and 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 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 to set an example to your students. Make it a positive discussion from which everyone can benefit.*

11. *The review of a case of a woman who has suffered from eclampsia or pre-eclampsia will have raised questions on the quality of care provided. These need to be discussed further. Divide the students into groups. 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 group work the class should have a list of points about good practice. Emphasize that these are important in saving lives and therefore in making pregnancy safer. Discuss how good practices can be further developed/encouraged and how poor practices 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 be taken?*
- *WHEN will it be evaluated?*

## HOW TO END THIS MODULE

*Ask each student to write down one thing they have learned from this module which has already changed their practice. It may be something small, but small things can be important.*

*Emphasize that every midwife who continues to learn and can apply that learning to practice, helps to make pregnancy safer.*

*Finally, ask each student to write down one thing about their practice which they intend to change in order to further make pregnancy safer.*

*Students may wish to share some of the changes they have already made and those they intend to make. Invite them to do so, but do not try to force them.*

*Post-test questions can be applied, if felt appropriate.*

## INSTRUCTIONS FOR GROUP WORK

Discuss either Section A or B (your teacher will advise you on which section to choose), plus Section C.

### Case studies on the management of eclampsia

#### 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 safer the management of eclampsia and other hypertensive disorders of pregnancy in your practice area.

Appoint a person to report back.

## INSTRUCTIONS FOR STUDENTS – guidelines for case study

Your case study must concern some aspect of the management of pre-eclampsia or eclampsia, and should include the following:

**Case number:**

(This will enable the case record to be traced if needed but will protect the confidentiality of the woman).

Age:	
Parity:	
Date of the first day of the last menstrual period (LMP):	
Estimated date of delivery (EDD):	
Social background:	
Past obstetric history:	
Relevant medical and surgical history:	
History and course of present pregnancy, labour and 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 condition of the woman after delivery.	This is the outcome
2. What risk factors for eclampsia were present (e.g. primigravida, twin pregnancy, pre-eclampsia or other risk)?	This is the process
3. How were pregnancy, labour and postnatal care 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? Factors may have been overlooked which, in another woman, would have resulted in maternal death. In cases of death, ask Was this avoidable?	This demonstrates what can be learned through experience



## GLOSSARY

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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.

<b>Abscess</b>	A localized collection of pus in any part of the body due to infection.
<b>AIDS</b>	Acquired immune deficiency syndrome.
<b>Amnion</b>	The innermost of the membranes enveloping the baby in the uterus and which produces and contains the amniotic fluid.
<b>Amniotic fluid</b>	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.
<b>Amniotic fluid embolism</b>	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.
<b>Amniotomy</b>	Surgical rupture of the fetal membranes to induce labour.
<b>Anaemia</b>	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
<b>Analgesic</b>	A drug given to relieve pain.
<b>Aneurysm</b>	A sac formed by the dilatation of the wall of an artery.
<b>Anoxia</b>	A state of being deprived of oxygen.
<b>Antepartum</b>	Before delivery.
<b>Antepartum haemorrhage</b>	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.
<b>Anterior</b>	Situated in front or directed towards the front.
<b>Antero posterior</b>	From front to back.
<b>Antibiotic</b>	Drugs derived from living micro-organisms which destroy or inhibit the growth of pathogenic bacteria. They are given to treat infection.
<b>Antibody</b>	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.

<b>Anticonvulsant drug</b>	A drug which controls convulsions.
<b>Antihypertensive</b>	A drug given to reduce high blood pressure.
<b>Antipyretic</b>	A drug given to reduce fever.
<b>Antiseptic</b>	A substance that prevents infection by killing certain bacteria on skin or body tissues. Antiseptics include surgical spirits, chlorhexidine and iodine.
<b>Anuria</b>	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.
<b>Apex</b>	The top or highest point.
<b>Apnoea</b>	Absence of breathing.
<b>Aseptic technique or asepsis</b>	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.
<b>Asphyxia</b>	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.
<b>Asymmetrical</b>	Unequal size or shape of two normally similar structures. The pelvis may be asymmetrical if distorted by disease, injury or congenital malformation.
<b>Atonic</b>	Lack of muscle tone.
<b>Atonic postpartum bleeding</b>	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.
<b>Augment</b>	To increase: in augmented labour, oxytocin may be used to increase the effectiveness of contractions if progress is slow.
<b>Avoidable factors</b>	Factors causing or contributing to maternal death where there is departure from generally accepted standards of care.
<b>Axilla</b>	The armpit.
<b>B</b>	
<b>Bacteria</b>	Microscopic, unicellular organisms which, if pathogenic, can cause disease. They reproduce extremely quickly, thus can rapidly multiply in the body.
<b>Bacteriuria</b>	Presence of bacteria in the urine.

<b>Bandl's ring</b>	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.
<b>Bartholin's glands</b>	Two small mucous-producing glands, one on each side of the vaginal orifice.
<b>Bimanual compression of uterus</b>	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.
<b>Bolus</b>	A dose of a pharmaceutical preparation which is given all at once.
<b>Broad ligament</b>	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.
<b>C</b>	
<b>Capsular decidua</b>	The part of the decidua which lies over the developing embryo during the first 12 weeks of pregnancy.
<b>Caput succedaneum</b>	Swelling of the fetal scalp due to pressure from the cervix. The swelling may be exaggerated in obstructed labour.
<b>Cavity</b>	A hollow place or space in the body.
<b>Cephalic presentation</b>	The head (i.e. cephal) lies in the lower pole of the uterus.
<b>Cephalopelvic disproportion</b>	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.
<b>Cerebral haemorrhage</b>	Bleeding in the brain due to a ruptured blood vessel.
<b>Cerebrospinal fluid</b>	The liquid contained inside the brain and around the spinal cord.
<b>Cervical os</b>	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.
<b>Chorioamnionitis</b>	Infection of the membranes that envelop the fetus in the uterus.
<b>Chorion</b>	The outermost of the two membranes which envelope the fetus in the uterus.
<b>Chronic</b>	Prolonged or permanent.

<b>Circulatory overload</b>	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.
<b>Coagulation</b>	Formation of a blood clot.
<b>Coagulation failure</b>	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.
<b>Coccyx</b>	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.
<b>Coma</b>	A state of unconsciousness from which the person cannot be aroused. The person is said to be in a coma or comatose.
<b>Contraction</b> (of pelvis)	Reduction in size.
<b>Cortical necrosis</b>	Death of the outer part of the substance of an organ (e.g. the kidney).
<b>Crepitations</b>	Dry, crackling sound.
<b>Cross-matching</b> (of blood)	A test of the compatibility of donor and recipient blood performed before transfusion.
<b>Crowning</b>	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.
<b>Cubital fossa</b>	The depression in the part of the arm which is in front of the elbow.
<b>Cyanosis</b>	A bluish discolouration of skin and mucous membranes due to lack of tissue oxygenation.
<b>Cystitis</b>	Infection of the urinary bladder.
<b>D</b>	
<b>Decidua</b>	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.

<b>Deep vein thrombosis</b>	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.
<b>Deficiency</b>	A lack of.
<b>Deflexed (head)</b>	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.
<b>Deformity</b>	Distortion of any part of the body. Malformation.
<b>Dehydration</b>	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.
<b>Delirium</b>	Disordered state of mind with incoherent speech, hallucinations and excitement. Commonly occurs with high fever.
<b>Diameter</b>	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.
<b>Differential diagnosis</b>	Deciding which of two or more conditions may be the cause of symptoms and signs noted.
<b>Direct obstetric death</b>	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.
<b>Disseminated intravascular coagulation</b>	Disturbance of the coagulation system triggered by certain conditions (e.g. septic or haemorrhagic shock, eclampsia) and characterized by generalized bleeding. (See coagulation failure).
<b>Distended</b>	Stretched.
<b>Distortion</b>	The state of being twisted out of normal shape.
<b>Diuresis</b>	Passing increased amounts of urine.
<b>Diuretic</b>	A drug that is given to increase the production of urine.
<b>Dorsal position</b>	Lying on the back.
<b>Drowsy</b>	Half asleep, dozing.
<b>Dysentery</b>	Infection in the intestines due to bacteria or parasites, causing pain in the abdomen and frequent stools containing blood, pus or mucous.

## E

<b>Eclampsia</b>	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.
<b>Empathy</b>	Intellectual and emotional awareness and understanding of another person's thoughts, feelings and behaviour, even those that are distressing and disturbing.
<b>Endocarditis</b>	Inflammation of the membrane lining the cavities of the heart.
<b>Endometritis</b>	Infection of the endometrium (inner lining of the uterus).
<b>Endometrium</b>	The innermost layer of the uterus.
<b>Engorged breasts</b>	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.
<b>Epigastric</b>	The upper middle region of the abdomen.
<b>Episiotomy</b>	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.
<b>Essential hypertension</b>	High blood pressure occurring without discoverable cause.
<b>Expansile</b>	Capable of stretching.
<b>Extend the knee</b>	To straighten the leg.
<b>Extension (head)</b>	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.
<b>External</b>	Situated on the outside.
<b>F</b>	
<b>False labour</b>	Painful uterine contractions which are not accompanied by cervical effacement and dilatation. Contractions often irregular and cease spontaneously after a few hours.
<b>Fatal</b>	Ending in death.
<b>Fetal sac</b>	The bag of membranes which envelop the baby in the uterus.
<b>Feto-maternal transfusion</b>	Passage of fetal blood into the blood circulation of the mother, through the placenta.
<b>Fibroids</b>	A benign tumour of the myometrium (muscle of the uterus).

<b>Fistula</b>	An abnormal passage or communication between two organs, 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.
<b>Flexed</b>	Bent forward.
<b>Flexible</b>	Pliant, i.e. bends easily.
<b>Flexion (head)</b>	Head is bent forward.
<b>Fluctuating</b>	Giving the sensation of wavelike motion on palpation, due to a liquid content (e.g. pus in an abscess).
<b>Foaming</b>	Collection of small bubbles formed in liquid by agitation; froth. Foaming at the mouth: occurs during a fit due to saliva and mucus bubbles.
<b>Fontanelle</b>	A membranous space on the baby's head where two or more sutures meet. Often called the 'soft spots.' The <b>anterior fontanelle</b> is the diamond-shaped membranous space on the front part of the head at the meeting of four suture lines. The <b>posterior fontanelle</b> is the small triangular membranous space on the back part of the head at the meeting of three suture lines.
<b>Fundus</b>	The rounded upper part of the uterus, above the insertion of the fallopian tubes.
<b>G</b>	
<b>Genital mutilation</b>	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.
<b>Genital tract</b>	The pathway formed by the genital organs including the uterine tubes, uterus, cervix, vagina, vulva.
<b>"Gishiri" cut</b>	A traditional practice among the Hausa people of Nigeria whereby the vagina is cut to facilitate delivery when labour is obstructed.
<b>Glycosuria</b>	The presence of glucose (sugar) in the urine.
<b>Grand mal epilepsy</b>	A major epileptic fit followed by loss of consciousness.
<b>Grand multiparity</b>	A woman who has borne five or more children.
<b>Groin</b>	The junctional region between the abdomen and the thigh.
<b>Grouping (of blood)</b>	Determining blood type (A, B, O, AB).
<b>H</b>	
<b>Haematemesis</b>	The vomiting of blood.

<b>Haematocrit</b>	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.
<b>Haematoma</b>	A localized collection of blood in an organ or tissue due to blood leaking from a blood vessel.
<b>Haemoglobin</b>	The substance in red blood cells which carries oxygen from the lungs to the tissues.
<b>Haemoglobinopathies</b>	Disorders of the blood caused by abnormal forms of haemoglobin (e.g. sickle cell anaemia, thalassaemia). Severe anaemia occurs in these conditions.
<b>Haemolytic anaemia</b>	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.
<b>Haemorrhage</b>	Excessive bleeding from a torn or severed blood vessel. It may occur externally or within the body.
<b>Hemiplegia</b>	Paralysis of one side of the body.
<b>HIV</b>	Human immune deficiency virus.
<b>Hollow</b> (of the sacrum)	The concave anterior surface of the sacrum.
<b>Humerus</b>	The bone that extends from the shoulder to the elbow.
<b>Hydatidiform mole</b>	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.
<b>Hydration</b>	The absorption of or combination with water.
<b>Hydrocephalus</b>	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.
<b>Hyperemesis gravidarum</b>	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.
<b>Hypertension</b>	High blood pressure.
<b>Hypertonic</b>	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.
<b>Hyponatraemia</b>	Insufficient sodium (salt) in the blood.

<b>Hypovolaemia</b>	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).
<b>Hypoxia</b>	A diminished oxygen supply to the tissues.
<b>I</b>	
<b>Idiopathic</b>	With no known cause.
<b>Idiopathic thrombocytopenia purpura</b>	Condition of unknown cause characterized by a decrease in the number of blood platelets resulting in inability of the blood to coagulate properly.
<b>Imminent</b>	Soon to happen.
<b>Incision</b>	A surgical cut.
<b>Indirect obstetric death</b>	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.
<b>Induced labour</b>	A labour that is started artificially by the use of oxytocic drugs and/or by rupturing the membranes.
<b>Infarct</b>	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.
<b>Infertility</b>	Difficulty or inability to conceive.
<b>Infiltration</b> (of local anaesthetic)	Method of injecting a local anaesthetic into the tissues. Infiltration of the perineum is carried out before an episiotomy is made.
<b>Internal</b>	On the inside.
<b>Intrapartum</b>	Occurring during childbirth.
<b>Intraperitoneal</b>	Within the peritoneal cavity.
<b>Intrauterine death</b>	Death of the fetus in the uterus.
<b>Intrauterine growth retardation (IUGR)</b>	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.
<b>Involution of the uterus</b>	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.
<b>Ischial spines</b>	The two small protuberances of the pelvis that project into the pelvic cavity and can be felt laterally upon vaginal examination.
<b>Isthmus</b>	The narrow connection between the body of the uterus and the cervix.

## K

<b>Ketoacidosis</b>	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.
<b>Ketonuria</b>	The presence of ketone bodies in the urine.
<b>Kyphosis</b>	Abnormally increased convexity in the curvature of the thoracic spine as viewed from the side.

## L

<b>Laparotomy</b>	Incision through the uterine wall to enter the peritoneal cavity.
<b>Lateral</b>	To the side.
<b>Leukopenia</b>	An abnormal decrease in the number of white blood cells which are the cells in the blood which fight infection.
<b>Liquor</b>	Another word for amniotic fluid.
<b>Lithotomy poles</b>	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.
<b>Lithotomy position</b>	The woman lies down on her back with legs wide apart and supported by the slings which hang on the lithotomy poles.
<b>Lochia</b>	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.
<b>Loin</b>	The part of the back between the thorax and the pelvis.
<b>Lumbar puncture</b>	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

<b>Malar bones</b>	The cheek bones.
<b>Malnutrition</b>	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.
<b>Marginal</b>	Borderline.
<b>Mastitis</b>	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.
<b>Mastoiditis</b>	Infection of the bone behind the ear. This can be a complication of otitis media (middle ear infection).
<b>Meconium</b>	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.
<b>Median</b>	Situated in the midline of a body or structure.
<b>Median cubital vein</b>	The vein situated in the midline of the cubital fossa.
<b>Medical audit</b>	Official examination of medical records.
<b>Meningitis</b>	Infection of the membranes enveloping the brain.
<b>Mental retardation</b>	Delayed mental development.
<b>Mento vertical diameter</b>	The distance between the chin and the vertex (highest point) of the head.
<b>Mid-biceps</b>	Halfway down the biceps (the muscle on the inside of the upper arm).
<b>Monoplegia</b>	Paralysis of one limb (arm or leg).
<b>Moulding</b> (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 malpresentations, or occurs too quickly, there is a danger of intracranial haemorrhage.
<b>Multipara</b>	A woman who has borne more than one viable child.
<b>Multiple pregnancy</b>	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.

<b>Oxygen</b>	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.
<b>Oxytocic</b>	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.
<b>P</b>	
<b>Parametritis</b>	Infection of the parametrium.
<b>Parametrium</b>	Connective tissue around the lower part of the uterus. It fills in the spaces between the uterus and related organs.
<b>Parity</b>	The number of viable children a woman has borne.
<b>Partograph</b>	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.
<b>Patella</b>	The bone situated at the front of the knee, forming the kneecap.
<b>Pathogenic</b>	An agent or microorganism which causes disease, e.g. pathogenic bacteria.
<b>Pelvic brim</b> (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.
<b>Pelvic inflammatory disease (PID)</b>	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.
<b>Pelvic outlet</b>	The diamond-shaped bony outlet of the pelvis through which the fetus passes at birth.
<b>Pericarditis</b>	Inflammation of the sac (pericardium) which surrounds the heart.
<b>Perimetrium</b>	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.
<b>Perinatal</b>	Around the time of birth.
<b>Perineum</b>	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.

<b>Peritoneal cavity</b>	The space containing the internal organs of the abdomen.
<b>Peritoneum</b>	Membrane covering the internal organs of the abdomen and lining the abdominal and pelvic cavity.
<b>Peritoneum, parietal</b>	Peritoneum lining the abdominal and pelvic cavity.
<b>Peritoneum, visceral</b>	Peritoneum that covers the abdominal organs, holding them into position.
<b>Peritonitis</b>	Infection of the peritoneum.
<b>Persistent occiput posterior</b>	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.
<b>Photophobia</b>	When light hurts the eyes.
<b>Physical disability</b>	A physical defect which may limit the individual's capacity to participate fully in normal life.
<b>Pivot</b>	To turn or swivel on a central point.
<b>Placenta praevia</b>	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.
<b>Placental abruption</b>	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.
<b>Pleurisy</b>	Infection of the membrane covering the lungs and lining the walls of the chest.
<b>Polyhydramnios</b>	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.
<b>Polyuria</b>	Excessive urination.

<b>Posterior</b>	Situated at the back of, or in the back part of, a structure.
<b>Postpartum</b>	After labour.
<b>Postpartum haemorrhage</b>	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.
<b>Potency</b>	The power of a medicinal agent to produce its desired effect.
<b>Pouch of Douglas</b>	The pocket like space between the rectum and the uterus.
<b>Pre-eclampsia</b>	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.
<b>Pre-term baby</b>	A baby who is born before the 37th completed week of pregnancy.
<b>Precipitate labour</b>	Labour which progresses unusually quickly.
<b>Primary postpartum haemorrhage</b>	Excessive bleeding from the genital tract in the first 24 hours after delivery. The amount of blood is 500 ml or more.
<b>Primigravida</b>	A woman pregnant for the first time.
<b>Primipara</b>	A woman who has borne one viable child.
<b>Prolonged labour</b>	Labour which exceeds 12 hours.
<b>Prolonged rupture of membranes</b>	Ruptured membranes for more than 18 hours, regardless of whether labour has started or not.
<b>Prophylactic</b>	An agent which is used to try and prevent disease.
<b>Prophylactic antibiotic treatment</b>	Giving antibiotics to prevent infection.
<b>Proteinuria</b>	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.
<b>Pubic arch</b>	The curved bowl-like bony structure which lies at the front of the pelvis.
<b>Puerperal sepsis</b>	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.
<b>Puerperium</b>	The 42-day period following delivery of the baby. Another word meaning the same is "postpartum period".

<b>Pulmonary embolism</b>	The blood circulation in the lungs is blocked by an embolus (blood clot).
<b>Pulmonary oedema</b>	Accumulation of fluid in the lungs.
<b>Purpura</b>	Small haemorrhage in the skin.
<b>Pyelonephritis</b>	Infection of the kidneys due to bacteria that have come up from the bladder after entering through the urethra.

## R

<b>Rales</b>	A rattling sound heard when listening to lungs that are diseased.
<b>Recumbent position</b>	Lying down.
<b>Resistant bacteria</b>	Bacteria which are not killed by a drug that usually kills that kind of bacteria.
<b>Resuscitation</b>	Bringing back to life or consciousness a person who is apparently dead.
<b>Retained placenta</b>	Describes the situation when the placenta has not been delivered within 30 minutes after the birth of the baby.
<b>Retracted</b>	Drawn back.
<b>Retroplacental</b>	Behind or underneath the placenta.
<b>Reversal</b>	A turn or change in the opposite direction.
<b>Rhesus factor</b>	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”.
<b>Rickets</b>	Softening of bones due to vitamin D deficiency during childhood.
<b>Risk factor</b>	Factors which make a condition more likely to happen or more dangerous.
<b>Rotation</b> (of fetal head)	The movement of the fetal head as it descends through the birth canal.
<b>Rupture</b>	Tearing or bursting of a structure, e.g. rupture of uterus following obstructed labour.
<b>Ruptured uterus</b>	Tearing or bursting of the uterus due to obstructed labour.

## S

<b>Sacral promontory</b>	The part of the first sacral vertebra which projects into the pelvic inlet.
<b>Sacrum</b>	The lowest part of the spine. It is formed by five sacral vertebrae.

<b>Sagittal suture</b>	The membranous line between fetal skull bones (parietal bones) running from the posterior fontanelle to the anterior fontanelle.
<b>Sanitation</b>	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.
<b>Scoliosis</b>	A lateral deviation in the normally straight vertical line of the spine.
<b>Secondary postpartum haemorrhage</b>	Includes all cases of PPH occurring between 24 hours after delivery of the baby and 6 weeks postpartum.
<b>Segment</b>	A section or a part of something.
<b>Self-retaining catheter</b>	A catheter that is left <i>in situ</i> in the bladder.
<b>Semiprone position</b>	Lying down on the left side.
<b>Semi-recumbent position</b>	Lying down with head and shoulders raised up.
<b>Septic shock</b>	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.
<b>Septicaemia</b>	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.
<b>Shock</b>	A life-threatening condition characterized by failure of the circulatory system to maintain normal blood flow to vital organs (e.g. kidneys, heart brain).  <i>Haemorrhagic shock</i> is shock due to low blood volume resulting from excessive blood loss.  <i>Septic shock</i> is shock due to overwhelming infection and results from the action of the pathogenic bacteria on the vascular system.
<b>Sinciput</b>	The brow, or forehead.
<b>Sinusitis</b>	Infection in the sinuses (air cavities in the cranial bones on either side of the nose and above the eyes).
<b>Sitz bath</b>	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.
<b>Smear</b>	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.
<b>Sodium lactate</b>	A solution of sodium lactate, sodium chloride, potassium chloride and calcium chloride which can be given via an intravenous infusion.
<b>Sonar</b>	A term for ultrasound in medical diagnosis.
<b>Spasms</b>	Sudden, strong, involuntary muscular contractions.

<b>Specific gravity</b>	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.
<b>Specimen</b>	A sample or part of a thing taken to determine the character of the whole e.g. specimen of urine.
<b>Splint</b>	A strip of rigid material such as wood, used to keep in place a movable body part.
<b>Sputum</b>	Matter ejected from the lungs, bronchi and trachea, through the mouth.
<b>Stasis (of urine)</b>	Standing still, not flowing properly.
<b>Stat</b>	A medical abbreviation meaning “at once”.
<b>Statistics</b>	A collection of numerical facts.
<b>Status</b>	Social position, relative importance of a person.
<b>Stenosis (of vagina)</b>	Narrowing of the vagina which is usually due to scarring caused by genital mutilation or unrepaired lacerations.
<b>Stillbirth</b>	A baby that is delivered dead (after the 22nd week of pregnancy).
<b>Stillborn</b>	A baby that is delivered dead.
<b>Stunted growth</b>	When a person is short, often because of insufficient food intake during childhood.
<b>Subarachnoid haemorrhage</b>	Bleeding within the membranes enveloping the brain due to a ruptured blood vessel.
<b>Subinvolution (uterus)</b>	The uterus is not reducing in size normally, (i.e. is slow to involute) during the early postpartum period.
<b>Suboccipitobregmatic diameter (of head)</b>	The distance from beneath the occiput to the anterior fontanelle.
<b>Symphysiotomy</b>	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.
<b>Symphysis pubis</b>	The cartilaginous area where the two pubic bones join at the front of the pelvis.
<b>T</b>	
<b>Talipes</b>	Clubfoot. A congenital abnormality when the foot has developed at an abnormal angle to the leg.
<b>Tenderness</b>	Painful when palpated.

<b>Term baby</b>	Baby born between 37 and 42 completed weeks of pregnancy.
<b>Testicles/testes</b>	The two glands in the scrotum which produce spermatozoa and male sex hormones.
<b>Tetanus</b>	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.
<b>Thorax</b>	The chest.
<b>Thrombophlebitis</b>	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.
<b>Thrombosis</b>	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.
<b>Tocolytic agent</b>	An agent that stops uterine contractions, e.g. ritodrine hydrochloride, salbutamol.
<b>Traditional birth attendant (TBA)</b>	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.
<b>Transient</b>	Temporary, not lasting a long time.
<b>Trauma</b>	Injury.
<b>Traumatic bleeding</b>	In obstetrics, occurs as a result of injury to the genital tract.
<b>Tumour</b>	A new growth of tissue which could be benign (harmless) or cancerous.
<b>Twitch</b>	Sudden, small, involuntary contractions.
<b>U</b>	
<b>Ultrasound</b>	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.

<b>Umbilical cord</b>	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.
<b>Uraemia</b>	An excess of urea in the blood. It is one of the signs of chronic kidney failure.
<b>Utero vesical pouch</b>	The pocket-like space between the uterus and the bladder.
<b>Uterus inversion</b>	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

<b>Vacuum extraction</b>	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.
<b>Vaginal fornix</b>	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.
<b>Varicose veins</b>	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.
<b>Venepuncture</b>	The puncture of a vein to get a blood sample or to set up an intravenous infusion.
<b>Vertex</b>	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.
<b>Virus</b>	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.
<b>Vitamins</b>	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

<b>Waddling gait</b>	Walking with an exaggerated elevation of the hips (rather like a duck walks).
<b>Water intoxication</b>	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

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*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 on 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 eclampsia, 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 is pre-eclampsia?*

A A condition specific to pregnancy, arising after the 20th week of gestation, characterized by hypertension and proteinuria.

Q2 *What is eclampsia?*

A A condition peculiar to pregnant or newly delivered women, characterized by convulsions which are followed by coma.

Q3 *What are the most common causes of death in eclampsia?*

A Inhalation of vomit or other secretions, pulmonary oedema, pneumonia, kidney failure, intracerebral haemorrhage, and failure of more than one organ.

Q4 *What are the effects of eclampsia on the fetus?*

A It causes placental dysfunction which may lead to intrauterine growth restriction, hypoxia and intrauterine death.

Q5 *What are three common risk factors for eclampsia?*

A Any three of the following: primigravidae, obesity, essential hypertension, multiple pregnancy, polyhydramnios, diabetes, hydatiform mole.

Q6 *What are three signs of impending eclampsia?*

A Any three of the following: a sharp rise in blood pressure, decreased urinary output, increased proteinuria, severe headache, drowsiness or confusion, visual disturbances, nausea and vomiting, epigastric pain.

Q7 *What are the four stages of an eclamptic fit?*

A Premonitory stage, tonic stage, clonic stage, coma.

Q8 *What are the six steps in the management of eclampsia?*

A Make sure the woman can breathe, control fits, control blood pressure, general management, including control of fluid balance, deliver the baby, monitor carefully to prevent further fits and identify complications.

Q9 *What are two drugs used to control eclamptic fits?*

A Magnesium sulphate and diazepam.

Q10 *What observations must the midwife carry out following an eclamptic fit?*

A Blood pressure, temperature, pulse respiration, colour (i.e. presence of cyanosis), level of consciousness, presence of restlessness and/or twitching, and if the woman has not delivered, fetal heart, contractions, vaginal loss and cervical dilatation.