Guidelines for Pregnancy Care and Management of Common Obstetric Complications by Medical Officers
Guidelines for Pregnancy Care and Management of Common Obstetric Complications by Medical Officers
India through its National Population Policy 2000 and National Health Policy 2002 has set a goal to bring down the Maternal Mortality Ratio to 100/100,000 live births by the year 2010 from its current level of above 400 in most of the States. The National Health Mission launched by the Hon'ble Prime Minister on 12th April 2005 reiterates this commitment.

It has been amply proven globally and more recently by our neighbouring countries that it is possible to accelerate the decline of Maternal Mortality by putting up into place skilled birth attendants (Midwives); operationalizing referral services and by strengthening institutions for handling obstetric emergencies.

In case, India wants to achieve the stated goals of Maternal Mortality i.e. less than 100 by 2010, steps will have to be initiated to accelerate the decline of MMR which has remained virtually stagnant at 400 plus since 1998. Under the Reproductive and Child Health programme, Phase II (RCH Phase II), therefore, a conscious decision has been taken to strengthen infrastructure, promote referral cases even by involving private sector and evidence based institutional best practices.

To achieve the key results on skilled attendance at birth, it is imperative to train and empower MOs/ANMs/LHVs as skilled birth attendants. In this regard, GOI has taken certain policy decisions which empower ANMs and LHVs to carry out certain emergency interventions after proper training and they have also been permitted to use drugs in specific emergency situations to reduce MMR.

Under the RCH Phase-II, the Government of India envisages that fifty percent of the PHCs and all the CHCs in all the districts would be made operational as 24-hour delivery centres, in a phased manner, by the year 2010. These centres would be responsible for providing Basic Emergency Obstetric Care and Essential Newborn Care and Basic Newborn Resuscitation services round the clock. Almost all the States have laid emphasis on Basic Emergency Obstetric Care and Skilled Attendance at Birth in the Project Implementation Plans (PIP) for RCH Phase II.

As such, the Medical Officers, who are in-charge of these health facilities, would, therefore, have to be equipped enough to be able to handle the common obstetric emergencies and provide the required care such as the skills and knowledge required for the administration of parenteral oxytocics, antibiotics and anti-convulsant drugs, manual removal of the placenta and the conduction of assisted vaginal deliveries.

The Maternal Health Division, Department of Health and Family Welfare has prepared these evidence based guidelines for pregnancy care and management of common obstetric complications that will enable the Medical Officers to perform their role, as anticipated under the Reproductive and Child Health programme, Phase II, in the Management of Common Obstetric Complications. I congratulate the Division and the other organisations, professional bodies and experts who have given whole hearted assistance for the development of these guidelines. I am sure that these guidelines, when implemented in word and spirit, will go a long way in reducing the enormous burden of maternal mortality in our country.

(Prasanna Hota)
Secretary (Health & Family Welfare)
24.06.2005
ACKNOWLEDGEMENTS

The Government of India is committed to achieve a reduction in maternal mortality to less than 100 per 100,000 live births by 2010. To achieve this goal, we will have to accelerate the implementation of interventions for reduction in mortality. The experience of countries like Sri Lanka, Thailand and Malaysia, has shown that this can be done through interventions and strategies such as Skilled Attendance at Birth, promoting institutional deliveries and operationalizing Emergency Obstetric Care at referral hospitals. These interventions are now part of Government of India’s Reproductive and Child Health Programme - Phase II being implemented in the country. The Government of India envisages that fifty percent of the Primary Health Centres and all the Community Health Centres should be operationalised as 24-hour delivery centres by the year 2010. These centres will also be responsible for providing pre-referral emergency care for women who develop complications during delivery. The “Guidelines for Pregnancy Care and Management of Common Obstetric Complications by Medical Officers” will help Medical Officers to provide services to women in labour and obstetric emergencies thereby reducing maternal mortality.

It would not have been possible to bring out these guidelines without the active interest and encouragement provided by Shri. P.K. Hota, the Secretary Health and Family Welfare, and I wish to convey my heart-felt gratitude to him for the same. I am also thankful to Ms. S. Jalaja, Additional Secretary, MoHFW and Mr. S.S. Brar, Joint Secretary, RCH for their support.

The guidelines have been designed with inputs form various professional bodies such as Federation of Obstetric and Gynaecological Societies of India (FOGSI), UN organizations, such as the WHO, UNFPA and UNICEF, Non governmental Organisations and other experts in the fields of Obstetrics and Gynaecology, Public Health and other specialties like Anaesthesiology and Pathology. I thank them all.

The assistance and active involvement of the White Ribbon Alliance of India has been very helpful and I would like to thank Dr. Bulbul Sood, Co-chair WRAI and Dr. Aparajita Gogoi, National Coordinator, WRAI, and Senior Advisor, CEDPA, for the same. We would also like to acknowledge the John D and Catherine T MacArthur Foundation for supporting CEDPA and the WRAI in this initiative.

A series of meetings were held over a period of nearly a year in order to finalize the guidelines and bring them out in the current form. It is not feasible to mention each and every name in this short acknowledgement, therefore, a ‘List of Contributors’ has been appended at the end of this document. I which to take this opportunity to thank each of the persons mentioned in the list for their help and contribution in bringing out the document.

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Government of India
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<th>Definition</th>
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<tbody>
<tr>
<td>@</td>
<td>at the rate of</td>
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<tr>
<td>%</td>
<td>per cent</td>
</tr>
<tr>
<td>ANC</td>
<td>Antenatal care</td>
</tr>
<tr>
<td>ANM</td>
<td>Auxiliary nurse-midwife</td>
</tr>
<tr>
<td>APH</td>
<td>Antepartum haemorrhage</td>
</tr>
<tr>
<td>ASHA</td>
<td>Accredited social health activist</td>
</tr>
<tr>
<td>AST</td>
<td>After sensitivity testing</td>
</tr>
<tr>
<td>AWW</td>
<td>Anganwadi worker</td>
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<tr>
<td>BCC</td>
<td>Behaviour change communication</td>
</tr>
<tr>
<td>BP</td>
<td>Blood pressure</td>
</tr>
<tr>
<td>CCT</td>
<td>Controlled cord traction</td>
</tr>
<tr>
<td>CHC(s)</td>
<td>Community health centre(s)</td>
</tr>
<tr>
<td>CPD</td>
<td>Cephalopelvic disproportion</td>
</tr>
<tr>
<td>DIC</td>
<td>Disseminated intravascular coagulopathy</td>
</tr>
<tr>
<td>e.g.</td>
<td>for example</td>
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<tr>
<td>EDD</td>
<td>Expected date of delivery</td>
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<tr>
<td>etc.</td>
<td>et cetera</td>
</tr>
<tr>
<td>FHR</td>
<td>Foetal heart rate</td>
</tr>
<tr>
<td>FHS</td>
<td>Foetal heart sound</td>
</tr>
<tr>
<td>FRU</td>
<td>First referral unit</td>
</tr>
<tr>
<td>GoI</td>
<td>Government of India</td>
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<tr>
<td>h/o</td>
<td>History of</td>
</tr>
<tr>
<td>Hb</td>
<td>Haemoglobin</td>
</tr>
<tr>
<td>HBV</td>
<td>Hepatitis B virus</td>
</tr>
<tr>
<td>Hg</td>
<td>Mercury</td>
</tr>
<tr>
<td>HIV</td>
<td>Human immunodeficiency virus</td>
</tr>
<tr>
<td>HLD</td>
<td>High-level disinfection</td>
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<tr>
<td>i.e.</td>
<td>that is</td>
</tr>
<tr>
<td>IFA</td>
<td>Iron-folic acid</td>
</tr>
<tr>
<td>IM</td>
<td>Intramuscular</td>
</tr>
<tr>
<td>Inj.</td>
<td>Injection</td>
</tr>
<tr>
<td>IUD</td>
<td>Intrauterine death</td>
</tr>
<tr>
<td>IUGR</td>
<td>Intrauterine growth retardation</td>
</tr>
<tr>
<td>IV</td>
<td>Intravenous</td>
</tr>
<tr>
<td>IVF</td>
<td>In vitro fertilization</td>
</tr>
<tr>
<td>LBW</td>
<td>Low birth weight</td>
</tr>
<tr>
<td>LHV</td>
<td>Lady health visitor</td>
</tr>
<tr>
<td>LMP</td>
<td>Last menstrual period</td>
</tr>
<tr>
<td>MMR</td>
<td>Maternal mortality ratio</td>
</tr>
<tr>
<td>MO</td>
<td>Medical officer</td>
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<tr>
<td>MoHFW</td>
<td>Ministry of Health and Family Welfare</td>
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<tr>
<td>MRP</td>
<td>Manual removal of placenta</td>
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<tr>
<td>MTP</td>
<td>Medical termination of pregnancy</td>
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<tr>
<td>MVA</td>
<td>Manual vacuum aspiration</td>
</tr>
<tr>
<td>N/A</td>
<td>not applicable</td>
</tr>
<tr>
<td>Acronym</td>
<td>Full Form</td>
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<tr>
<td>NAMP</td>
<td>National Anti-Malaria Programme</td>
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<tr>
<td>NFHS</td>
<td>National Family Health Survey</td>
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<tr>
<td>NSAID</td>
<td>Non-steroidal anti-inflammatory drug</td>
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<tr>
<td>NGO(s)</td>
<td>Non-governmental organization(s)</td>
</tr>
<tr>
<td>ORS</td>
<td>Oral rehydration solution</td>
</tr>
<tr>
<td>P/S</td>
<td>per speculum</td>
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<tr>
<td>P/V</td>
<td>per vaginum</td>
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<tr>
<td>PHC(s)</td>
<td>Primary health centre(s)</td>
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<tr>
<td>PIH</td>
<td>Pregnancy-induced hypertension</td>
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<tr>
<td>PNC</td>
<td>Postnatal care</td>
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<tr>
<td>PPH</td>
<td>Postpartum haemorrhage</td>
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<tr>
<td>PROM</td>
<td>Premature or prelabour rupture of membranes</td>
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<tr>
<td>RGI</td>
<td>Registrar General of India</td>
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<tr>
<td>R/L</td>
<td>Ringer lactate</td>
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<tr>
<td>RR</td>
<td>Respiratory rate</td>
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<td>RTI</td>
<td>Reproductive tract infection</td>
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<tr>
<td>SBA</td>
<td>Skilled birth attendant</td>
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<tr>
<td>SRS</td>
<td>Sample Registration Survey</td>
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<tr>
<td>STI</td>
<td>Sexually transmitted infection</td>
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<td>Tab.</td>
<td>Tablet</td>
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<tr>
<td>TBA</td>
<td>Traditional birth attendant</td>
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<tr>
<td>TT</td>
<td>Tetanus toxoid</td>
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<tr>
<td>UTI</td>
<td>Urinary tract infection</td>
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<tr>
<td>vs.</td>
<td>versus</td>
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<tr>
<td>WHO</td>
<td>World Health Organization</td>
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<tr>
<td>°C</td>
<td>degree Celsius</td>
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<tr>
<td>mcg</td>
<td>microgram</td>
</tr>
<tr>
<td>cc</td>
<td>cubic centimetre</td>
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<td>cm</td>
<td>centimetre</td>
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<td>dl</td>
<td>decilitre</td>
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<td>g</td>
<td>gram</td>
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<td>IU</td>
<td>International units</td>
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<tr>
<td>kcal</td>
<td>kilocalories</td>
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<td>kg</td>
<td>kilogram</td>
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<td>units</td>
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India’s share of 16% of the world’s population is substantially lower than its share of over 20% of the total maternal deaths in the world. The absolute number of women losing their lives annually during childbirth is even more daunting. The maternal mortality ratio (MMR) estimated at 407 per 100,000 live-births (Sample Registration Survey [SRS], Registrar General of India [RGI] 1998) is incredibly high when compared to other countries in Asia, i.e. 60 in China, 37 in Iran and 30 in Sri Lanka. In some states, the MMR is considerably higher than the national average.

Maternal deaths usually result from major complications during pregnancy, childbirth or during the postpartum period, such as haemorrhage, sepsis, hypertension and obstructed labour, as well as a consequence of unsafe abortion. Indirect causes such as anaemia, tuberculosis, malaria and hepatitis are also responsible for deaths during pregnancy. In addition, millions of women survive such complications but suffer acute or chronic ill health or life-threatening disabilities.

Most maternal deaths are preventable because although obstetric complications can neither be reliably predicted nor prevented, they can certainly be managed effectively, without necessarily resorting to sophisticated and expensive technologies/drugs. On the one hand, health education programmes are needed to raise awareness about danger signs during pregnancy and childbirth, on the other, a societal response for effective communication and transport arrangement for women experiencing complications can cut down delays tremendously and save several lives. The quality and timeliness of response in managing obstetric complications at identified community health centres (CHCs)/primary health centres (PHCs) are extremely crucial for reducing the number of maternal deaths. Even if a woman develops obstetric complications, her chances of survival are excellent if she receives adequate and appropriate care in time. The interventions described in this Manual are devised on this premise.

The present document is intended to serve as a reference material for medical officers (MOs) for managing obstetric complications at facilities offering emergency management of common obstetric complications. This reference manual, based on the guidelines for Pregnancy Care and Management of Common Obstetric Complications, as envisaged under the Reproductive and Child Health RCH-II Programme, will also be useful during the training of doctors.

It is important that service providers recognize and acknowledge the various constraints women face in seeking health care. Delays in recognition of complications, in taking a decision to seek care (the decision-making power is usually within the domain of the men of the family) and delays in accessing reliable transportation means in the villages, especially during the night, are some of these constraints. These guidelines will serve their objectives only if the other delays influenced by socioeconomic factors, including gender-related issues, are also addressed by corresponding behaviour change communication (BCC) interventions.
Why these guidelines?

The stagnant maternal mortality ratio (MMR) in India over the past few decades is a serious concern. The National Population Policy 2000 has acknowledged the need to undertake effective programmatic interventions to reduce the MMR to less than 100 by the year 2010. Presently, there is a dearth of simplified evidence-based service delivery guidelines to facilitate service providers and programme managers to design technically sound and effective interventions. The need for these guidelines stems from the realization that the lack of such material is a major constraint in the delivery of quality care during pregnancy, skilled attendance at birth and the management of common obstetric complications.

Who is the target audience?

The target audience for these guidelines are medical officers (MOs) working at primary and community health centres (PHCs/CHCs), and their supervisors. Under the RCH-II Programme, 50% of the PHCs and all the CHCs will receive additional inputs to enable them to provide services as 24-hour functioning Reproductive and Child Health Centres. Service providers from non-governmental organizations (NGOs) and private/trust hospitals may also find these guidelines useful. Information given in this manual may also be helpful for private practitioners/service providers.

These guidelines will also be useful for policy-makers and programme managers at different levels of care in the health system, who are engaged in reducing the MMR.

How to use these guidelines?

There are three modules in this set of guidelines. Module 1 deals with the management of a woman with a normal pregnancy, labour and postpartum period. Module 2 deals with the management of common obstetric complications. The clinical steps in these two modules are primarily based on sound clinical assessment with limited reliance on laboratory investigations, especially in peripheral settings. It is also crucial that service providers respect women's rights and be sensitive and responsive to their needs. Information about counselling of women accessing services for obstetric complications is included in Module 3, which also provides information on prevention of infection.

Although this is not intended to be a training manual, this material can also be used for organizing training programmes.
Obstetrics is primarily a preventive science. More than 95% of women have a normal pregnancy and childbirth. For these women, health care is needed to ensure that the normal physiological process remains thus. Minor but significant interventions are required to improve the condition of the woman and to regulate the physiological process. For example, iron-folic acid supplementation is needed to correct the physiological haemodilution that occurs during pregnancy; an episiotomy may be required to assist a vaginal delivery; or contraceptive advice needs to be given to a couple to help them delay (or prevent) the next pregnancy, thus giving the woman much-needed time to recover from the stress associated with pregnancy and childbirth. Health practitioners also need to watch out for any complication that may arise and manage it as early as possible before it becomes life-threatening.

This module has four chapters. The first three deal with the whole process chronologically, from pregnancy through childbirth to the postpartum period. As newborn care is a natural extension of maternal care and forms an integral part of "Reproductive and Child Health", a fourth chapter on newborn care, including resuscitation of the newborn, has also been included.

This module will give you information on evidence-based guidelines in managing a woman with a normal pregnancy, and what complications to watch out for during that period. The management of those complications, should they occur, is given in Module 2. It is envisaged that medical officers working at primary health centres will find these guidelines useful in their day-to-day work related to the management of normal pregnancies.
Effective antenatal care (ANC) can improve the health of the mother and give her a chance to deliver a healthy baby. Regular monitoring during pregnancy can help detect complications at an early stage before they become life-threatening emergencies. However, one must realize that even with the most effective screening tools currently available, one cannot predict which woman will develop pregnancy-related complications. Hence, every pregnant woman needs special care. As the medical officer (MO) in charge, you must remember the following:

- Recognize that "Every pregnancy is at risk".
- Ensure that ANC is used as an opportunity to detect and treat existing problems.
- Make sure that services are available to manage obstetric emergencies.
- Prepare pregnant women and their families for the eventuality of an emergency.

The important components of ANC are discussed below.

**Early registration**

**Timing of the first visit/registration**

The first visit or registration of a pregnant woman for ANC should take place as soon as the pregnancy is suspected. Every married woman in the reproductive age group should be encouraged to visit her health provider or inform you if she believes herself to be pregnant.

Ideally, the first visit should take place in the first trimester, before or at the 12th week of pregnancy. However, even if the woman comes late in her pregnancy for registration, she should be registered, and care given to her according to the gestational age.

During regular monthly meetings, emphasize to the auxiliary nurse-midwives (ANMs) and other health workers to inform the pregnant woman and her family members about the timings of the ANC clinic organized at the primary health centres (PHCs)/community health centres (CHCs). Explain the importance of seeking timely ANC, during their outreach visits.

**Importance of early registration**

Early registration is required to:

- Assess the health status of the mother and obtain baseline information on blood pressure (BP), weight, haemoglobin, etc.
- Screen for complications early and manage them appropriately by referral as and when required.
- Help the woman recall the date of her last menstrual period (LMP).
- Give the woman the first dose of tetanus toxoid injection (Inj. TT) well in time (after 12 weeks of pregnancy).
- Help the woman access facilities for an early and safe abortion if she does not want to continue with the pregnancy. Be alert to the possibility that the abortion might be an attempt at female foeticide. (Refer to the Government of India [GoI] Guidelines for the Medical Termination of Pregnancy [MTP].)
- Build a good rapport with the pregnant woman. Allow plenty of time to counsel the woman and her family.
- Start the woman on a regular dose of iron folic acid during the first trimester (see later in this chapter under "Iron-folic acid (IFA) supplementation").
**Record-keeping**

Complete the antenatal card for every woman registered/examined by you. Hand over the card to the woman. Instruct her to bring the card with her for all subsequent check-ups/visits, and carry it along with her at the time of delivery.

Record this information in the PHC/CHC antenatal register.

**Antenatal check-up**

**Number and timing of visits**

Ensure that every pregnant woman makes at least 4 visits for ANC, including the first visit/registration and any home visits by the ANM/lady health visitor (LHV). These are sufficient and, for pregnancies without complications, studies have shown that additional visits do not improve the maternal or perinatal outcome.

The first visit is recommended as soon as the pregnancy is suspected. This is meant for registration of the pregnancy and the first antenatal check-up. The second visit should be scheduled between the 4th and 6th month (around 26 weeks). The third one should be planned in the 8th month (around 32 weeks), and the fourth one in the 9th month (36-40 weeks).

**Preparing for the ANC clinic**

Before beginning each ANC clinic, ensure that all the required instruments/equipment, e.g. stethoscope, sphygmomanometer, weighing scale, inch tape, are available and in working condition.

Greet every pregnant woman in a friendly manner at each visit.

Listen to the woman's problems and concerns and offer advice or refer to a CHC or a first referral unit (FRU), as appropriate. Remember, every woman needs social support during pregnancy.

Confirm that pregnancy is wanted. If not, and the woman wishes to go in for an abortion, offer her manual vacuum aspiration (MVA)/MTP services if they are available at your PHC/CHC, or refer her to the nearest CHC/FRU where safe abortion services are available. (You are advised to follow the GoI guidelines for the Medical Termination of Pregnancy.) This is important, especially during the first visit when MTP is still feasible.

Conduct the antenatal examination in a room/enclosure that allows privacy for conducting an abdominal palpation.

Record all findings accurately on the antenatal card, and in the antenatal register.

**History-taking**

During the antenatal visits, take a detailed history of the woman (i) to diagnose the pregnancy (first visit only, if required); (ii) to identify any complications during previous pregnancies which may have a bearing on the present one; and (iii) to identify any medical or obstetric condition(s) that may complicate the present pregnancy (first and subsequent visits).

While taking the history, ask the following questions:

**Date of the last menstrual period**

Remember that the LMP refers to the FIRST day of the woman's last menstrual period. Ensure that the woman, while telling you her LMP, is NOT referring to the date of the first MISSED PERIOD. This mistake
will lead to a miscalculation of the gestational age and expected date of delivery (EDD) by 4 weeks.

If the woman is unable to remember the exact date, encourage her to remember some major event/festival, etc. which she might link with her LMP. A calendar with the Indian system of months, dates and local festivals might come in handy. If the exact date of the LMP is not known, and it is still early pregnancy, the gestational age can be calculated from the size of the uterus on vaginal examination done during the first trimester. However, if the woman comes to you late in the pregnancy, assess the fundal height to estimate the gestational age (see Annexure 2a: “Measuring the fundal height”). You may also ask for the date when the foetal movements were first felt. This is known as “quickening” and is felt at around 20 weeks of gestation.

If the woman has undergone a test to confirm the pregnancy, ask her the approximate date when it was done, and also after how many days of amenorrhoea. This will assist you in estimating her LMP.

The LMP is used to calculate the gestational age at the time of check-up and the EDD. In cases with uncertain LMP, calculate the EDD based on the above estimates. Make a special note on the records of these cases that the LMP, and therefore the EDD, are approximated.

The following formula for calculation of the EDD is based on the assumption that the menstrual cycle of the woman was regular before conception and it was a 28-30 days' cycle. If the period of the menstrual cycle is more than 30 days, add the additional number of days in the cycle (beyond 28 days) to the EDD calculated below.

$$\text{EDD} = \text{LMP} + 9 \text{ months} + 7 \text{ days} (+ \text{ additional days, if any})$$

**Age of the woman**

This is required as women below 16 years of age or above 40 years have greater chances of having pregnancy-related complications.

**Order of the pregnancy**

Primigravídas and those who have had 4 or more pregnancies are at a higher risk of developing complications during pregnancy and labour.

**Birth interval**

Research shows that women who have spaced their children less than 36 months apart have greater chances of delivering a premature and low birth-weight (LBW) baby, with consequently increased risk of infant mortality.

An interval of less than 2 years from the previous pregnancy or 3 months from the previous abortion increases the chances of the mother developing anaemia.

**Symptoms during the present pregnancy**

You must ask for symptoms that might be causing the woman some discomfort, and also for symptoms which indicate that a complication may arise. Ask the woman for the following symptoms in the present pregnancy:

**Symptoms that indicate discomfort**

- nausea and vomiting
- heartburn
- constipation
- increased frequency of micturition
**Box 1. Symptoms which indicate that a complication may arise**

- Fever
- Vaginal discharge
- Palpitations, easy fatiguability and breathlessness at rest
- Generalized swelling of the body; puffiness of the face
- Vaginal bleeding
- Decreased or absent foetal movements
- Leaking of watery fluid per vaginum (P/V)
- Decreased urinary output

[See also Table 1, later in this chapter for the presumptive diagnosis and management of these symptoms and signs.]

**Previous pregnancies**

It is essential to ask a woman about her previous obstetric history, especially if she had suffered from any complications. This is important as some complications may recur during the present pregnancy.

Ask the woman about:
- the total number of previous pregnancies (including the present one, "gravida") and deliveries ("parity")
- abortion(s)
- premature birth(s)
- stillbirth(s) or neonatal loss
- hypertensive disorders of pregnancy (if not known, ask for a history of convulsions in previous pregnancies)
- prolonged labour
- obstructed labour
- malpresentation, such as breech delivery
- antepartum haemorrhage (APH)
- postpartum haemorrhage (PPH)
- assisted delivery (forceps or vacuum extraction)
- delivery by caesarean section
- birth weight of the previous baby
- any surgery on the reproductive tract (e.g. myomectomy, removal of the septum, cone biopsy, cervical cerclage, uterine perforation following an MTP, etc.)
- isoimmunization (Rh -ve) in the previous pregnancy (history of [h/o] any costly injection given within 72 hours of the previous delivery)
Ask especially for notes on the previous pregnancy, if available.

**Box 2. Conditions under which a pregnant woman must be referred to an FRU**

- Previous stillbirth or neonatal loss
- History of three or more consecutive spontaneous abortions
- Birth weight of the previous baby >4500 g
- Hospital admission for hypertension or pre-eclampsia/eclampsia in the previous pregnancy
- H/o surgery on the reproductive tract
- isoimmunization (Rh -ve) in the previous pregnancy

**History of any systemic illness(es)**
Rule out any personal history of systemic illnesses such as
- hypertension
- diabetes
- heart disease
- tuberculosis
- renal disease
- epilepsy
- asthma
- rashes
- jaundice

**Family history of systemic illness**
If the woman does not have any of the above-mentioned systemic illnesses, ask for a family history of hypertension, diabetes and tuberculosis. If present, such a history predisposes the woman to developing the same herself during pregnancy (e.g. hypertensive disorders of pregnancy, gestational diabetes, etc.). As pregnancy is a physiologically stressful period in a woman's life, it can unmask the underlying tendency to develop these disorders.

Also ask for a family history of thalassaemia, or whether anybody in her family has received blood transfusions. You must also ask for a family history of delivery of twins and/or the delivery of an infant with congenital malformation, as the presence of such a history in the family increases the chances of the woman giving birth to a child with the same defect.

**History of drug intake or allergies**
It is important to find out whether the woman is allergic to any drug, or if she is taking any drug that might be harmful to the foetus. Find out whether she had undergone any treatment or taken drugs for infertility. If yes, then the woman has a higher chance of having twins and other multiple pregnancies.
History of intake of habit-forming or harmful substances

Ask the woman if she takes tobacco (chewing or smoking) and/or alcohol. If yes, she needs to be counselled to discontinue them during pregnancy, as they harm the developing foetus. Even after the delivery, the woman should be advised to continue to abstain from taking alcohol and tobacco as their use may lead to other complications such as addiction and/or cancer.

Physical examination

This activity will be nearly the same during all the visits. Initial readings may be taken as a baseline and compared with the later readings.

General examination

Weight: A pregnant woman's weight should be taken at each visit. The weight taken during the first visit/registration should be treated as the baseline weight.

Normally, a woman should gain 9-11 kg during her pregnancy. After the first trimester, a pregnant woman gains around 2 kg every month or 0.5 kg per week. To calculate the expected weight gain since her previous visit, multiply the number of weeks elapsed since the previous visit by 0.5 kg. This should be compared with the actual weight gained.

If the diet is inadequate, with less than the required amount of calories, the woman might gain only 5-6 kg during her pregnancy. Suspect an inadequate dietary intake if the woman gains less than 2 kg per month. Put her on food supplementation. Take the help of the ANM or refer the woman to the anganwadi worker (AWW) of her village for food supplementation, especially for those categories of women who need it the most [see later in this chapter under Counselling for "Diet and rest"]; A low weight gain usually points towards intrauterine growth retardation (IUGR) and results in an LBW baby.

Excessive weight gain (more than 3 kg in a month) should arouse the suspicion of pre-eclampsia/twins (multiple pregnancy). Check the woman's BP, and test her urine to check if she has proteinuria.

To calculate the weight gain since her previous visit, multiply the number of weeks elapsed since the previous visit by 0.5 kg. This should be compared with the actual weight gained.

Blood pressure: Measure the BP of pregnant women at every visit to rule out hypertensive disorders of pregnancy [see Annexure 1: "Measuring the blood pressure"].

If the BP is high (more than 140/90 mmHg; or diastolic more than 90 mmHg), check the BP again after 1 hour. If it is still high, test the woman's urine for the presence of albumin, as the combination of a high BP and proteinuria is sufficient to categorize the woman as having pre-eclampsia. These women need to be managed as per the guidelines [see Module 2, Chapter 2: "Hypertensive disorders of pregnancy"].

If the diastolic BP of the woman is above 110 mmHg, it is a danger sign pointing towards severe eclampsia. Refer the woman to the CHC/FRU immediately after giving her a dose of Nifedipine.

A woman with pregnancy-induced hypertension (PIH)/pre-eclampsia requires hospitalization for daily/alternate day monitoring of BP, the level of protein in the urine and foetal condition.
Pallor: Pull down the lower eyelid and look at the lower palpebral conjunctiva, and also the nails, palms, tongue and oral mucosa of the woman for the presence of pallor. If present, it is an indication that the woman is anaemic. Investigate her haemoglobin (Hb) level [see later in this chapter under Investigation for "Haemoglobin estimation"].

Respiratory rate (RR): It is important to check the RR, especially if the woman complains of breathlessness. If the RR is more than 30 breaths/minute and pallor is present [see above in this chapter under Examination for "Pallor"], it indicates that she has severe anaemia. Manage her as per the guidelines [see Module 2, Chapter 5: "Anaemia during pregnancy and in the postpartum period"].

If the RR of the woman is >30 breaths/minute, and she has other associated medical problems, refer her to the specialist at the FRU for further investigation and management of any systemic illness, if present.

Generalized oedema: The presence of generalized oedema or puffiness of the face should arouse the suspicion of pre-eclampsia.

Breast examination
Observe the size and shape of the nipples for the presence of inverted or flat nipples. Try and pull out the nipples to see if they are protractile (i.e. can be pulled out easily). Flat nipples that are protractile do not interfere with breastfeeding. However, truly inverted nipples might create a problem in carrying out successful breastfeeding.

If the nipples are inverted, advise the woman to roll her nipples between the thumb and the index finger, pulling at the nipples simultaneously.

Another technique for correcting inverted nipples includes the use of a 10 cc or 20 cc disposable plastic syringe. Cut the barrel of the syringe from the end where the needle is attached. Take out the plunger and put it in from the opposite end, which is the cut end of the syringe. Push the piston forward fully, and place the open end of the barrel so that it encircles the nipple and areola. Ask the woman to pull back the plunger and create negative pressure. The nipple will be sucked into the barrel and thus be pulled out in the process.

Using a syringe for correcting an inverted nipple

- Crusting and soreness of the nipples must be looked for. If present, the woman must be advised regarding breast hygiene. If the nipples do not heal, look for infection or any other cause and treat accordingly.
The breasts must be palpated for any lumps or tenderness. If present, refer the woman to the surgical specialist at the FRU.

**Vaginal examination**
- Vaginal examination is required, especially during the first visit, to confirm the pregnancy.
- This is also used to measure the gestational age, by estimating the size of the uterus during the first trimester of pregnancy, before the uterus becomes an abdominal organ.
- A per speculum (P/S) examination may be done during the first and last antenatal visit, especially if the woman complains of discharge P/V. This would help in defining whether it is a vaginal or a cervical discharge, and the type of discharge, thus assisting you in making a diagnosis of reproductive tract infection (RTI), and managing the case accordingly.

**Abdominal examination**
Examine the abdomen to monitor the progress of the pregnancy and foetal growth, and to check the foetal lie and presentation.

**Fundal height:** The fundal height indicates the progress of the pregnancy and foetal growth. The uterus becomes an abdominal organ after 12 weeks of gestation. The gestational age (in weeks) can be estimated from the fundal height (in cm) after 12 weeks of gestation [see Annexure 2a: "Measuring the fundal height"].

If the height of the uterus is more than that indicated by the period of amenorrhoea, the possible reasons could be:
- wrong date of LMP
- full bladder
- multiple pregnancy
- polyhydramnios
- hydatidiform mole
- pregnancy with a pelvic tumour.

If the height of the uterus is less than that indicated by the period of amenorrhoea, the possible reasons could be:
- wrong date of LMP
- intrauterine growth retardation (IUGR)
- missed abortion
- intrauterine death (IUD)
- hydatidiform mole
- transverse lie.

**Foetal lie:** Palpate for the foetal lie and assess whether it is longitudinal, transverse or oblique. Remember, if a malpresentation is diagnosed before 36 weeks, no active management or intervention is recommended at that point of time [see Annexure 2b: "Determining the foetal lie and presentation"].
You must be able to recognize a transverse lie. Missing it can be disastrous because there is no mechanism by which a woman with a transverse lie can deliver vaginally. This woman would need a caesarean section, and hence should be referred to an FRU where emergency obstetric care services are available, including the facility for a caesarean section. Failure to do a timely caesarean section in such a woman can lead to obstructed labour, rupture of the uterus, and death of the woman.

**Foetal presentation**: Check the foetal presentation, especially in the case of a longitudinal lie, to see whether the presenting part is the vertex (normal), or any other part of the cephalic end (face, brow), or the breech [see Annexure 2b: "Determining the foetal lie and presentation"].

**Foetal heart rate (FHR)**: If the FHR is between 120 and 160 beats per minute, it is normal. Both foetal bradycardia (FHR <120 beats/minute) and foetal tachycardia (FHR more than 160 beats per minute) indicate foetal distress [see Annexure 2c: "Auscultating for the foetal heart sound (FHS)"].

Remember that the FHS is not heard before the 24th week of pregnancy; hence the FHS needs to be checked from the second visit only.

**Multiple pregnancy**: This must be suspected if the following are present on examination:
- an unexpectedly large uterus for the estimated gestational age
- feeling multiple foetal parts on abdominal palpation
- polyhydramnios, as it is often associated with multiple pregnancy

If a multiple pregnancy is suspected, refer the woman to an FRU’s Obstetrics and Gynaecology specialist for confirmation and, if confirmed, arrange for delivery in the FRU.

**Assessment of the pelvis**

Examination of the pelvis is required to assess if it is adequate for delivering the baby vaginally. This should be done during the last ANC visit (at about 36 weeks of gestation) to rule out any cephalopelvic disproportion (CPD) [see Annexure 3: "Assessing the pelvis for any cephalopelvic disproportion"].

Remember, it is not advisable to give a pregnant woman any medication during the first three months of

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Signs/investigations</th>
<th>Most probable diagnosis</th>
<th>Action(s) to be taken</th>
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</thead>
</table>
| • Vomiting during the first trimester | | • May be physiological (morning sickness) | • Advise the woman to eat small frequent meals; avoid greasy food, eat lots of green vegetables and drink plenty of fluids.
• If vomiting is excessive in the morning, ask her to eat dry foods such as biscuits or toast after waking up in the morning. |
<table>
<thead>
<tr>
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<th>Signs/investigations</th>
<th>Most probable diagnosis</th>
<th>Action(s) to be taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excessive vomiting, especially after the first trimester; inability to retain anything taken orally</td>
<td>The woman may be dehydrated</td>
<td>Hyperemesis gravidarum</td>
<td>Admit her for a few days at the PHC and manage as given under the management of &quot;Hyperemesis gravidarum.&quot; [see Module 2, Chapter 6b]</td>
</tr>
</tbody>
</table>
| Palpitations, easy fatiguability, breathlessness at rest | Conjunctival and/or palmar pallor present | Severe anaemia | Start the woman on a double dose of IFA tablets.  
Give her albendazole (second trimester onwards only).  
Monitor the Hb level after one month.  
Advise her for delivery at the FRU. [see Module 2, Chapter 5] |
| Puffiness of the face, generalized body oedema | BP >140/90 mmHg  
Proteinuria absent  
BP >140/90 mmHg  
Proteinuria present | Hypertensive disorder of pregnancy  
Pre-eclampsia | If the BP is <160/110 mmHg, advise home management with rest and regular follow up.  
If the BP is >160/110 mmHg, start on Nifedipine.  
Start the woman on antihypertensive medication.  
Refer to an FRU for further management.  
Advise her on the danger signs of imminent eclampsia and eclampsia and refer to an FRU. [see Module 2, Chapter 2] |
| Heartburn and nausea | Reflux | Hypertensive disorder of pregnancy | Advise the woman to avoid spicy and rich foods.  
Ask her to take cold milk during attacks.  
If severe, antacids may be prescribed. |
<table>
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</tr>
</thead>
<tbody>
<tr>
<td>• Increased frequency of urination up to 10-12 weeks of pregnancy</td>
<td>• Tenderness may be present at the sides of the abdomen and back. The body temperature may be raised</td>
<td>• May be physiological due to pressure of the gravid uterus on the urinary bladder</td>
<td>• Reassure her that it will be relieved on its own</td>
</tr>
<tr>
<td>• Increased frequency of urination after 12 weeks, or persistent symptoms, or burning on urination</td>
<td>• Urinary tract infection</td>
<td></td>
<td>• Manage as given under the management of “UTI” [see Module 2, Chapter 6a]</td>
</tr>
<tr>
<td>• Constipation</td>
<td>• Physiological</td>
<td></td>
<td>• Advise the woman to take more fluids, leafy vegetables and a fibre-rich diet.</td>
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<tr>
<td></td>
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<td></td>
<td>• If not relieved, prescribe Isabgol, 2 tablespoonfuls to be taken at bedtime, with water or with milk.</td>
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<td></td>
<td></td>
<td></td>
<td>• Do NOT prescribe strong laxatives as they may initiate uterine contractions.</td>
</tr>
<tr>
<td>• Bleeding P/V, before 20 weeks of gestation</td>
<td>• Check the pulse and BP to assess for shock</td>
<td>• Threatened abortion/spontaneous abortion/hydadiform momole/ectopic pregnancy</td>
<td>• Carry out an MVA to evacuate the retained products of conception. [see Module 2, Chapter 1a]</td>
</tr>
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<td></td>
<td>• Ask for history of violence</td>
<td>• Spontaneous abortion due to violence</td>
<td>• Ask the ANM to put the woman in touch with local support groups.</td>
</tr>
<tr>
<td>• Bleeding P/V, after 20 weeks of gestation</td>
<td>• Check the pulse and BP to assess for shock</td>
<td>• Antepartum haemorrhage</td>
<td>• Do NOT carry out a vaginal examination</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Refer to an FRU. [see Module 2, Chapter 1b]</td>
</tr>
<tr>
<td>• Fever</td>
<td>• The body temperature is raised</td>
<td>• Site of infection somewhere, including possible sepsis</td>
<td>• Try to ascertain the cause of fever. Start the woman on antibiotics.</td>
</tr>
<tr>
<td></td>
<td>• Blood peripheral smear is positive for malarial parasite</td>
<td>• Malaria</td>
<td>• Manage according to the NAMP guidelines for malaria in pregnancy. Treat the malarial fever.</td>
</tr>
<tr>
<td>Symptoms</td>
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<td>Most probable diagnosis</td>
<td>Action(s) to be taken</td>
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<tr>
<td>• Decreased or absent foetal movements (NOTE: Foetal movements are felt only after about 4 months of gestation)</td>
<td>• FHS heard, and within the normal range of 120-160 beats/minute</td>
<td>• Baby is normal</td>
<td>• Reassure the woman.</td>
</tr>
<tr>
<td></td>
<td>• FHS heard, but the rate is &lt;120 beats/minute, or &gt;160 beats/minute</td>
<td>• Foetal distress</td>
<td>• Re-check the FHS after 15 minutes.</td>
</tr>
<tr>
<td></td>
<td>• FHS not heard</td>
<td>• Intrauterine foetal death</td>
<td>• If the FHS is still out of the normal range, manage as given under the management of &quot;foetal distress.&quot; [see Module 2, Chapter 7b]</td>
</tr>
<tr>
<td>• Vaginal discharge, with or without abdominal pain</td>
<td>• RTI/STI</td>
<td>• Inform the woman and her family that the baby might not be well.</td>
<td></td>
</tr>
<tr>
<td>• Leaking of watery fluids P/V</td>
<td>• Wet pads/cloths</td>
<td>• If labour pains are present, conduct the delivery in the usual manner.</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• If there are no labour pains, refer to an FRU for induction of labour to terminate the pregnancy.</td>
</tr>
</tbody>
</table>

pregnancy (first trimester), unless absolutely essential. Even then it must be ensured that the drugs given are proven to be safe when taken during pregnancy, and do not have teratogenic effects on the foetus [see Annexure 6: "Prescribing drugs during pregnancy"].

**Laboratory investigations**

The following laboratory investigations are recommended at the primary health care provider level to be carried out as a part of ANC.
Haemoglobin estimation
[See Annexure 4: "Estimating the level of haemoglobin"]
Estimation of the level of Hb is essential for the following:

* To check for the presence of anaemia and, if present, to what degree.
* For the further management of prevention and/or treatment of anaemia, in so far as the administration of IFA tablets is concerned [see later in this chapter, under "Iron-folic acid supplementation"]. If the anaemia is severe, the woman may need injectable iron preparations or referral to undergo a blood transfusion.
* For the diagnosis of PPH in an anaemic woman in whom a smaller amount of blood loss is taken as PPH.

Estimate the level of Hb in pregnant women at the initial antenatal visit and again at 28 weeks. The initial Hb level will serve as a baseline to compare with the later results at 28-30 weeks. An Hb level below 11 g/dl at any time in pregnancy is considered to be anaemia; an Hb level of 7-11 g/dl as moderate anaemia, and less than 7 g/dl as severe anaemia.

If the woman is found to be anaemic, start her on the therapeutic dose of IFA [see later in this chapter under "IFA supplementation"]. Estimate the level of Hb again after one month. If there is no rise in the Hb level, refer the woman to a higher facility. Manage as given in the chapter on Management of anaemia [see Module 2, Chapter 5: "Anaemia during pregnancy and in the postpartum period"].

Blood grouping
Knowing the blood group (ABO and Rh) can be of great help in cases of haemorrhage, when precious time could be saved and blood transfusion started as soon as possible, when required.

Getting the blood group tested is especially important before conducting an MTP.

Testing the urine for the presence of albumin
This is a test used in the definition of pre-eclampsia, which (along with eclampsia) is an important cause of maternal mortality [see Annexure 5a: "Testing the urine for the presence of protein"].

Testing the urine for the presence of sugar
This test is required to rule out the presence of gestational diabetes. Though not a sensitive method, it is specific and useful as a cheap screening test [see Annexure 5b: "Testing the urine for the presence of sugar"].

Testing the urine for bacteriuria
This is important, especially in women complaining of burning micturition. You are advised to carry out this test if the facilities for the same exist in your PHC laboratory [see Annexure 5c: "Testing the urine for bacteriuria"].

Interventions
Iron-folic acid supplementation
Stress the need for increased requirements of iron during pregnancy and the dangers of anaemia to every pregnant woman.
All pregnant women need to be given one tablet of IFA (100 mg elemental iron and 0.5 mg folic acid) every day for at least 100 days. This is the prophylactic dose of IFA.

Start IFA at the prophylactic dose as early as possible, preferably as soon as the pregnancy is registered. However, ensure that the woman is able to tolerate the intake of IFA, as iron has a tendency of aggravating the nausea and vomiting, which are a part of morning sickness during the first trimester.

If a woman is anaemic (Hb <11 g/dl or she has pallor), give her two tablets of IFA per day for three months. This means a woman with anaemia in pregnancy needs to take at least 200 tablets of IFA. This is the therapeutic dose of IFA.

A woman with severe anaemia (Hb <7 g/dl, or those who have breathlessness and tachycardia due to anaemia) should be started on the therapeutic dose of IFA and also be investigated to detect the cause of anaemia. She may require injectable iron preparations, if iron deficiency is found to be the cause of anaemia.

Many women do not take IFA regularly due to some common side-effects. The necessity of taking IFA and the dangers associated with anaemia should be explained to the mother. Tell her:

* Though the tablets should be taken preferably early in the morning on an empty stomach, she may take the tablets with meals or at night. This will help avoid nausea.
* She should not worry about black stools. This is normal while taking IFA tablets.
* If she has constipation, ask her to drink more water.
* These side-effects are not serious.
* She should avoid taking the tablets with tea, coffee or milk as they reduce the absorption of iron.
* Tablets containing calcium should not be taken at the same time as IFA tablets, as the absorption of iron is reduced in the presence of calcium.
* Although IFA tablets may make a woman feel less tired than before, advise her not to stop the tablets despite feeling better.
* She should return to you if she has problems in taking IFA tablets.

**Injection tetanus toxoid (Inj. TT) administration**

Administration of two doses of Inj. TT to a pregnant woman is an important step in the prevention of neonatal tetanus. The first dose of TT should be given just after the first trimester, or as soon as the woman registers for ANC, whichever is later. The second dose is to be given one month after the first dose, but preferably at least one month before the EDD because, if the gap between the second dose of TT and the EDD is less than 4 weeks, the efficacy of the vaccine is reduced.

Inj. TT is to be given as 0.5 ml per dose, deep intramuscular (IM) in the upper arm.

If the woman has received Inj. TT during a previous pregnancy, a single dose of injection is sufficient. However, in case of doubt, give two injections.

Inform the woman that there may be slight swelling, pain and/or redness at the injection site for a day or two.

**Malaria prophylaxis**

You are advised to follow the guidelines of the National Anti-Malaria Programme (NAMP) for malaria prophylaxis. At the time of printing of this document, the NAMP recommends that in malaria-endemic areas of India, pregnant women should be given intermittent malaria prophylaxis.
If a pregnant woman is diagnosed with malaria, start the treatment for malaria (in accordance with the NAMP Guidelines), as malarial fever can cause more harm to the health of the mother and the baby than the drugs used for its treatment.

**Counselling**

**Birth preparedness and complication readiness**

It is estimated that 4 out of 10 pregnant or postpartum women will experience some complication related to their pregnancy; and in about 15% of them, the complication will be potentially life-threatening and will require emergency obstetric care. Since most of these complications cannot be predicted, every pregnancy necessitates preparation for a possible emergency.

**Birth preparedness**

**Identification of a skilled provider for birth:** All pregnant women should be helped to reach a decision regarding the health provider they want for conducting their delivery. A "skilled birth attendant" (SBA) should be preferred over an unskilled one. (Note that traditional birth attendants (TBAs), trained or untrained, do not fall into the category of "skilled birth attendants"). Other factors such as the condition of the pregnancy (complicated or uncomplicated), the distance to the health facility, transport facilities, financial situation, etc. all need to be kept in mind before finally reaching a decision about the choice of birth attendant.

**All pregnant women must be encouraged to opt for an institutional delivery.** Explain to her why delivery at a health facility is recommended. Tell her that

* Any complication can develop during delivery; complications are not always predictable; they can cost the life of the mother and/or the baby.
* A health facility has staff, equipment, supplies and drugs available to provide the best care, if needed. It even has a referral system should the need arise to refer to a higher facility.

**Identify support people:** People are needed to help the woman care for her children and/or household, arrange for transportation, and/or accompany the woman to the health facility in an emergency. Advise the woman and her family to identify such people and to seek help from either the close relatives of the woman or community-based health functionaries such as the ANM, AWW, accredited social health activist (ASHA) and the TBA. Ask the ANM of the area to assist the woman for this purpose.

**Finances:** The woman and her family should be given an estimate of the expected expenses for the delivery and related aspects (such as transport, etc.). They should also be advised to keep some emergency fund, or have a source for emergency funding, should a complication arise and more money is required than initially anticipated. You should also be aware of the existing schemes that provide funds for maternal health, and any other schemes that may be launched from time to time (for example, refer to the provisions made for women living below the poverty line under the Janini Suraksha Yojana launched in 2005). Help the women and their families access these schemes and receive the allocated funds to pay for their delivery.

**Signs of labour:** Advise the woman to come to the PHC or contact the SBA if she has any one of the following signs which indicate labour:

- A bloody, sticky discharge P/V
- Painful abdominal contractions every 20 minutes or less
- The bag of waters has broken, and she has clear fluid coming out P/V ("leaking").
Complication readiness

Danger signs: The woman and her family/caretakers should be informed about potential danger signs during pregnancy, delivery and the postpartum period. She must be told that if she has any of the following during pregnancy, delivery or the postpartum/post-abortion period, she should immediately visit an FRU or the PHC, WITHOUT WAITING, be it day or night.

Box 3. Danger signs: Visit an FRU

Advise the woman to visit an FRU immediately if she has any of the following conditions:

- Any bleeding P/V during pregnancy, and heavy (>500 ml) vaginal bleeding during and following delivery
- Severe headache with blurred vision
- Convulsions or loss of consciousness
- Labour lasting for more than 12 hours
- Failure of delivery of the placenta within 30 minutes of delivery
- Preterm labour (onset of labour before 34 weeks of gestation)
- Cases with leaking P/V (PROM)
- Continuous severe abdominal pain
- All cases of medical illnesses associated with pregnancy, such as diabetes mellitus, heart disease, asthma, etc. at the onset of labour pains

Box 4. Danger signs: Visit a 24-hour PHC

Advise the woman to visit a 24-hour PHC if she has any of the following conditions:

- High fever with or without abdominal pain, and the woman is too weak to get out of bed (indicating infection/sepsis)
- Fast or difficult breathing (dyspnoea)
- Decreased or absent foetal movements
- Excessive vomiting, wherein the woman is unable to take anything orally, leading to a decreased urinary output

Location of the nearest health centre/FRU: The woman and her family members should be aware of the nearest health facility, both the PHC where 24-hour functioning emergency obstetric care services are available and the FRU, where facilities for a blood transfusion and surgery are available.

Identification of transportation facilities: Delay in reaching a health care facility is one of the major "delays" responsible for maternal mortality. If the woman has decided to deliver at a health facility, a vehicle should be identified which should be available whenever the woman needs it, to take her to that health facility.

Even if the woman decides to deliver at home, a vehicle should be identified and ideally be kept ready to transport her to the nearest health facility or referral centre in case she develops some complications needing immediate referral and care.

The help of the Panchayat, Village Health Committee, Mahila Mandals, youth groups, or any other such
groups can be taken to decide on how to obtain a vehicle in case of an emergency, in case a vehicle is not available in the village.

The various schemes available for assisting the woman with transportation facilities should be kept in mind. Also keep yourself informed regarding any new schemes that may be launched from time to time.

**Preparedness for blood donation**: Haemorrhage, both antepartum and postpartum, is an important cause of maternal mortality. Blood transfusion can be life-saving in such cases. As blood cannot be "bought" one needs voluntary donors to replace the blood before it is issued for transfusion. Such donors (2-3 in number) must be ready, should the need arise.

**Diet and rest**

The woman should be advised to eat more than her normal diet throughout her pregnancy. Remember, a pregnant woman needs about **300 extra kcal per day** compared to her usual diet. She should be told that she needs these extra calories for:

- maintenance of her health as a mother
- the needs of the growing foetus
- successful lactation.

**Chart 1 : Diet Chart during pregnancy and lactation**

<table>
<thead>
<tr>
<th>Food Item (in grams)</th>
<th>Adult Woman</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Moderate work</td>
</tr>
<tr>
<td>Cereals</td>
<td>440</td>
</tr>
<tr>
<td>Pulses</td>
<td>45</td>
</tr>
<tr>
<td>Leafy vegetables</td>
<td>100</td>
</tr>
<tr>
<td>Other vegetables</td>
<td>40</td>
</tr>
<tr>
<td>Roots and tubers</td>
<td>50</td>
</tr>
<tr>
<td>Milk</td>
<td>150</td>
</tr>
<tr>
<td>Oil and Fat</td>
<td>25</td>
</tr>
<tr>
<td>Sugar or Jaggery</td>
<td>20</td>
</tr>
</tbody>
</table>

**Special categories of women** have been identified who should be given priority for additional nutrition during pregnancy. They include the following:

* Women with a reduction in the dietary intake below habitual levels during pregnancy
* Women who have an increased level of physical activity above the usual levels during pregnancy
* Women with a combination of both the above-mentioned factors
* Adolescent girls who become pregnant
* Women who become pregnant during lactation
* Women who become pregnant within two years of the previous delivery.
• The woman’s food intake should be especially rich in proteins, iron, vitamin A and other essential micronutrients.

* The other members of the family, especially those who take decisions regarding the type of food brought home and/or given to the pregnant woman, such as her husband and mother-in-law, should also be taken into confidence and counselled regarding the recommended diet for the pregnant woman. Ask for their assistance to help ensure that the woman eats enough and avoids hard physical work.

* Some of the recommended dietary items are cereals, milk and milk products such as curd, green leafy vegetables and other vegetables, pulses, eggs and meat, including fish and poultry (if the woman is a non-vegetarian), nuts (especially groundnuts), jaggery, fruits, etc. Give examples of the types of food, suggested preparations, if possible, and how much to eat.

* Tell her about the locally available foods rich in iron such as groundnuts and jaggery. Tell the woman to avoid taking tobacco, tea, coffee or milk, especially within one hour of a meal, as they have been shown to interfere with the absorption of iron. Also advise her to take foods rich in proteins and vitamin C (e.g. lemon, amla, guava, oranges, etc.) as both help in the absorption of iron.

* The diet should be rich in fibre so that she does not have constipation.

* The diet should be advised keeping in mind the socioeconomic conditions, food habits and taste of the individual.

* Food taboos must be looked into while counselling the woman regarding her dietary intake. If there are taboos about nutritionally important foods, the woman should be advised against these taboos. In certain communities, food taboos exist for sex selection of the foetus. These, especially omission of certain foodstuffs from the diet, should be strongly discouraged.

* If a woman has PIH, she should be encouraged to eat a normal diet with no restrictions on fluid, calorie and/or salt intake; such restrictions do not prevent PIH from converting into pre-eclampsia, and may be harmful to the foetus.

* The woman should be advised to refrain from taking alcohol or smoking during pregnancy.

* The woman should be advised NOT to take any medication unless prescribed by a qualified health practitioner.

* The woman should be advised to sleep for 8 hours at night and rest for another 2 hours during the day. She should be advised to refrain from doing heavy work, such as construction work and full-time farm labour work, as it can adversely affect the birth weight of the baby. The other members of the household should be taken into confidence and advised to help the woman in carrying out her routine household chores.

* All pregnant women should be told to avoid the supine position, especially in late pregnancy, as it affects both the maternal and the foetal physiology. During pregnancy, the pressure exerted by the uterus on the main pelvic veins results in a reduced quantity of circulating blood reaching the right side of the heart. This causes reduced oxygenation to the brain and can therefore lead to a fainting attack, a condition referred to as the supine hypotension syndrome. It can also result in abnormal FHR patterns, and may also cause a reduction in the placental blood flow. If the supine position is necessary, a small pillow under the lower back at the level of the pelvis is recommended.
**Sex during pregnancy**

- It is safe to have sex throughout the pregnancy, as long as the pregnancy is "normal".
- Sex should be avoided during pregnancy if there is a risk of abortion (h/o previous recurrent spontaneous abortions), or a risk of a preterm delivery (h/o previous preterm labour).
- Some women experience a decreased desire for sex during pregnancy. The husband should be informed that this is normal and the woman’s consent should be sought before engaging in sex. This is extremely important as forced and unsafe sex can have adverse consequences on the health of the mother and the foetus, resulting in an abortion or preterm labour.
- Some couples find engaging in sex uncomfortable during pregnancy. The comfort of the woman should be ensured by her husband during sex.

**Infant and young child feeding**

Pregnancy is the ideal time to counsel the mother regarding the benefits of breastfeeding her baby. Though breastfeeding is almost universal in India, a few points need to be emphasized to the would-be-mother.

**Initiation of breastfeeding**

Counsel the mother that breastfeeding should ideally be initiated within half an hour of a normal delivery (or within two hours of a caesarean section, or as soon as the mother regains consciousness, in case she undergoes a caesarean section).

It is common practice in India to delay initiation. Colostrum (the first milk) is thrown away, and pre-lacteal feeds are given instead. This has obvious disadvantages. One, the pre-lacteal feed may not be hygienic and can cause an intestinal infection in the baby. Second, the baby is deprived of colostrum, which is very rich in protective antibodies.

Most importantly, the sucking and rooting reflexes in the child, which are essential for the baby to successfully start breastfeeding, are the strongest immediately after delivery, making the process of initiation much easier for the mother and the baby. These reflexes gradually become weaker over the span of a few hours, thus making breastfeeding difficult later on.

**Exclusive breastfeeding for 6 months:** Emphasize to the mother that only breast milk and nothing but breast milk should be given to the baby for the first 6 months, not even water. Assure the mother that breast milk contains enough water to quench the baby’s thirst (even in the peak of summer) and satisfy its hunger for the first 6 months. Take special care in the case of a female child to ensure that she is adequately breastfed and not discriminated against because of her sex.

**Demand feeding:** This refers to the practice of breastfeeding the child whenever he/she “demands” it, as can be made out by the child crying. The practice of feeding the child by the clock should be actively discouraged. After a few days of birth, most children will develop their own “hunger cycle” and will feed every 2-4 hours. Remember that each child is different as far as the feeding requirements and timings are concerned.

The practice of giving night feeds should be actively encouraged. Often, there is a misconception that breastfeeding the baby at night disturbs the mother’s sleep, thus denying her of adequate rest. Inform the woman and her husband that this is not so. Night feeds help the baby to sleep more soundly.

**Rooming in:** This refers to the practice of keeping the mother and baby in the same room and preferably on the same bed. This is usually practised in India. This practice should be encouraged as it has certain advantages.

* Makes demand feeding easier to practise, as the mother can hear the child cry.
* Keeps the baby warm, thus preventing hypothermia in the newborn.
* Helps build a bond between the mother and the baby.
Complementary feeding at 6 months: The mother should be told that after 6 months of age, breast milk alone does not meet the nutritional requirements of the baby. The baby needs supplementary food, IN ADDITION TO BREAST MILK. Advise the mother to begin with semi-solid soft food devoid of spices, supplemented with a small amount of ghee/butter/oil. The frequency of feeds and the quantity of each feed should be increased gradually. Over a period of time, the baby may be given solid foods. A one-year-old child should start eating from the family pot, and should have an intake that is about half of the adult diet.

Feeding bottles should be strictly discouraged.

Contraception

The woman should be advised regarding birth spacing (or limiting, as the case may be). Explain to the woman and her partner that after birth, if she has sex and is not exclusively breastfeeding, she can become pregnant as early as six weeks after delivery. Therefore, it is important to start thinking early about what family planning method they will use.

Ask about the couple’s plans for having more children. If they desire more, advise them that a gap of 3-5 years between pregnancies is healthier for both the mother and the child.

Compulsory institutional deliveries

Every pregnant woman should be advised and encouraged to go in for an institutional delivery. However, about 60% of the deliveries in India still occur at home. There are medical/obstetric conditions during a pregnancy when the chances of a complication occurring are increased, and a home delivery may be risky and potentially life-threatening. Under such conditions, explain to the woman why the delivery needs to be at a facility level only and strongly advise her to deliver only in an institutional setting (FRU or PHC, as the case may be). Such conditions/complications are

24-hour PHC
* Mild pre-eclampsia
* PPH in the previous pregnancy
* More than 5 previous births
* Previous assisted delivery
* Maternal age less than 16 years
* H/o third-degree tear in the previous pregnancy

FRU
* Severe anaemia
* Severe pre-eclampsia/eclampsia
* APH
* Transverse foetal lie or any other malpresentation
* Caesarean section in the previous pregnancy
* Multiple pregnancies
* Premature or prelabour rupture of membranes (PROM)
* Medical illnesses such as diabetes mellitus, heart disease, asthma, etc. during pregnancy.
Diagnosis of labour

Intermittent contractions after 22 weeks of gestation, contractions associated with blood-stained discharge or watery vaginal discharge should raise a suspicion of the onset of labour. Normal vaginal discharge should not be confused with show. The onset of labour can be confirmed by the following:

- Cervical effacement—progressive shortening and thinning of the cervix during labour
- Cervical dilatation [see Annexure 8: "Assessing cervical dilatation"]

Cervical effacement and dilatation

Stages of labour

- The **first stage** of labour starts with the onset of labour pains to full dilatation of the cervix. This stage takes about 12 hours in primigravidas and half that time for subsequent deliveries.
- The **second stage** starts from full dilatation of the cervix to the delivery of the baby. This stage takes about 2 hours for primigravidas and only about half an hour for subsequent deliveries.
- The **third stage** starts after the delivery of the baby and ends with the delivery of the placenta. This stage takes about 15 minutes to half an hour, irrespective of whether the woman is a primigravida or multigravida.
- Frequent monitoring for one hour immediately after delivery is critical to detect PPH. This period is sometimes referred to as the **fourth stage** of labour.

Assessment of the progress of labour

The progress of labour is assessed by:

- Assessing the changes in cervical effacement and dilatation (by conducting a P/V examination)
- Assessing the progress in foetal descent (by conducting an abdominal and/or a P/V examination).

Abdominal examination to assess the descent of the presenting part

Abdominal palpation should be conducted to assess the descent of the presenting part. If the head is above the symphysis pubis it is fully palpable and mobile. If the head is entirely below the symphysis pubis it is not palpable abdominally.
**Vaginal examination to assess the stage and progress of labour**

- Always examine the abdomen before examining the vagina.
- Do NOT shave the perineal area.
- Prepare clean gloves (see Annexure 7: "Preparing 'clean' gloves"); swabs and pads.
- Wash your hands with soap and water (see Module 3, Chapter 2: "Prevention of infection") before and after each examination. Carry out the vaginal examination under strict aseptic conditions.
- Always inform the woman and take her verbal consent before carrying out a vaginal examination.
- Perform a vaginal examination gently. Do not start a vaginal examination during a contraction.
- REMEMBER, do not carry out a vaginal examination if the woman is bleeding at the time of labour or at any time after 5 months (20 weeks) of pregnancy. Manage this as a case of "Vaginal bleeding in late pregnancy" (see Module 2, Chapter 1b: "APR-Haemorrhage during late pregnancy and labour").
- Clean the vulva and perineal area with a mild antiseptic solution. Use a cotton swab soaked in antiseptic solution to clean the vulva. Wipe the vulva in the anterior to posterior direction. Use a swab only once.
- Place the woman in the supine position with her legs flexed and apart.
- Separate the labia with the thumb and forefinger of the left hand and clean the area once again. Use two fingers of the right hand (index and middle fingers) and insert them gently into the vaginal orifice without hurting the woman.
- During a vaginal examination, determine the following:
  * Cervical effacement
  * Cervical dilatation in cm (see Annexure 8: "Assessing cervical dilatation")
  * The presenting part. Try and judge if it is hard, round and smooth (the head?). If not, try and identify the presenting part. In case the vertex is not the presenting part, manage the case as a malpresentation. Such cases need to be referred to a higher health facility.
  * The position or the station of the presenting part.
  * Feel for the membranes. Are they intact?
  * If the membranes have ruptured, check whether the colour of the amniotic fluid is clear or meconium-stained.
  * Feel for the umbilical cord. If it is felt, it is a case of prolapsed cord. If the cord pulsations are felt, refer the woman to an FRU immediately. Explain to the woman and her family that a caesarean section may be required. Manage the woman as given under the management of "Prolapsed cord" (see Module 2, Chapter 7c: "Prolapsed cord").
- The stage of labour can be decided as follows:
  * If the cervix is dilated 1-3 cm, and the contractions are weak and less than 2 in 10 minutes, this is the first stage of labour; but the woman is not in active labour yet.
  * If the cervix is dilated >3 cm, but not fully, the woman is still in the first stage of labour. However, she is now in active labour.
  * Full cervical dilatation (10 cm; the cervix is no longer felt on vaginal examination), a bulging thin perineum, a gaping vagina and anus, and the head visible through the introitus, even in between contractions indicate the second stage of labour, and that delivery is imminent.
- Remember, vaginal examinations are rarely required more frequently than once every 4 hours.
• Oxytocic drugs such as Inj. Oxytocin IM, should not be given before delivery of the baby. The use of oxytocic drugs is associated with an increased incidence of rupture of the uterus and consequent severe APH.

**Supportive care to the woman during labour**

• Explain all the procedures, seek permission for examination and carrying out the procedures, and discuss the findings with the woman.

• Keep the woman informed about the progress of labour.

• Praise the woman, encourage her and reassure her that things are going well.

• Ensure and respect the privacy of the woman during examinations and discussions.

• Encourage the woman to bathe or wash herself and her genitals at the onset of labour.

• Always wash your hands with soap and water before examining the woman [see Module 3, Chapter 2: "Prevention of infection"].

• Ensure cleanliness of the birthing area.

• **Enema** should NOT be routinely given during labour. Enema should be given only when needed, e.g. when the woman complains of constipation on admission or at the onset of labour, or if the woman wishes to have an enema.

• Encourage the woman to empty her bladder frequently. Remind her every 2 hours or so.

• The presence of a second person or a **birth companion** of the woman’s choice in addition to an SBA is beneficial. Birth companions provide comfort, emotional support, reassurance, encouragement and praise. On a practical level too, the presence of a second person is valuable, in that if at any point during the labour additional assistance is required, or in an emergency, this second person can be useful, even if it is only to seek help. But one must ensure cleanliness and concentrate on preventing infection.

• Women should be allowed to **remain mobile** during labour, especially the first stage, as this helps in having a shorter and less painful labour.

• The woman should be free to choose any **position** she desires and feels comfortable in during labour and delivery. She may choose from the left lateral, squatting, kneeling, or even standing (supported by the birth companion) positions. Remember, given a choice, the woman will often change positions as no position is comfortable for very long.

• To relieve the woman of pain and discomfort, a change in position and mobility is helpful. Encourage the birth companion to massage the woman's back if she finds this helpful, to hold the woman’s hand and sponge the woman’s face between contractions.

• Other **non-pharmacological methods of relieving** pain during labour include:
  * Calm and gentle voice of the birth attendant
  * Offering the woman encouragement, reassurance and praise
  * Relaxation techniques performed by the woman such as deep breathing exercises and massage
  * Placing a cool cloth on the woman's forehead
  * Assisting the woman in voiding urine and in changing her position.

• Women who are not at risk of requiring general anaesthesia can have light, easily digested, low-fat **food during labour**, if they wish. The advantages of having food far outweigh any risks related to a full stomach and the use of general anaesthesia. This is because labour requires large amounts of energy. In
women who have not eaten for some time, or who are undernourished, the effects of labour can quickly lead to physiological exhaustion, dehydration and ketosis (maternal acidosis), which can lead to foetal distress. Therefore, encourage the woman to eat and drink as she wishes throughout labour.

**Normal delivery**

**Management of the first stage of labour**

**Not in active labour**
The cervix is dilated 0-3 cm and contractions are weak, less than 2 in 10 minutes.

- **Monitor** the following every hour:
  - Frequency (once in how many minutes), intensity (how strong), and duration (for how many seconds does it last) of contractions.
  - FHR ([see Annexure 2c: "Auscultating for the foetal heart sound"]). The normal FHR is between 120 and 160 beats/minute.
  - The presence of any sign that denotes an emergency (such as difficulty in breathing, shock, vaginal bleeding, convulsions or unconsciousness)

- **Monitor** the following every 4 hours:
  - Cervical dilatation (in cm)
  - Temperature
  - Pulse
  - BP

- Record the time of rupture of the membranes and the colour of the amniotic fluid.
- Never leave the woman alone.
- If after 8 hours, the contractions are stronger and more frequent, but there is no progress in cervical dilatation with or without rupture of the membranes, this is a case of **non-progress of labour**. Refer the woman immediately to an FRU.
- On the other hand, if after 8 hours, there is no increase in the intensity/frequency/duration of contractions, and the membranes have not ruptured and there is no progress in cervical dilatation, ask the woman to relax. Advise her to send for you again when the pain/discomfort increases, and/or there is vaginal bleeding, and/or the membranes rupture.
- If the membranes were already ruptured on admission, but even after 8 hours there is no increase in the frequency/intensity of contractions, refer the woman to an FRU (prolonged latent phase) for induction of labour.

**In active labour**
The cervix is dilated 3 cm or more:

- **Monitor** the following every 30 minutes:
  - Frequency, intensity and duration of the contractions
  - FHR
  - Presence of any emergency sign ([see above in this chapter]).
Monitor the following every 4 hours:
* Cervical dilatation (in cm)
* Temperature
* Pulse
* BP

Again, do not leave the woman alone.

Start maintaining a partograph once the woman is in active labour.

**Simplified partograph**

The partograph is a graphic recording of the progress of labour and salient features of the mother and foetus. It is a tool to assess the progress of labour and recognize the need for action and referral at the appropriate time.

The instructions for filling the partograph are given below.

**Foetal condition**
- The FHR should be counted and recorded every half-an-hour. Count the FHR for one full minute. The rate should preferably be counted immediately following a uterine contraction. An FHR of >160 beats/minute or <120 beats/minute indicates foetal distress. Manage as given under "Foetal distress" [see Module 2, Chapter 7b: "Foetal distress"]. Each of the small boxes in the vertical column of a partograph represents half-hour intervals.
- Simultaneously record the condition of the membranes and colour of the amniotic fluid as visible at the vulva every 30 minutes as:
  * Intact membranes (mark 'I')
  * Clear liquor (mark 'C')
  * Meconium stained (mark 'M')
  * No liquor (mark 'A').

**Labour**
- Start plotting on the labour graph only after the woman is in active labour. The woman is said to be in active labour when the cervical dilatation is more than 3 cm and at least 2 good contractions (i.e. each lasting for more than 20 seconds) occur in 10 minutes.
- Start recording the cervical dilatation (in cm) when the woman first reports in labour and then every four hours.
- The initial recording is placed to the left of the alert line (cervical dilatation must be 3 cm and above, i.e. the woman must be in active labour before you start plotting the graph). Normally the line should continue to remain to the left of the alert line. Write the time accordingly in the row for time.
- If the alert line is crossed (the graph moves to the right of the alert line), it indicates prolonged labour, and you should be alert that labour is not progressing as it should. Note the time when the alert line is crossed. Start preparing for referral to an FRU.
- Crossing of the action line (the graph moves to the right of the action line) indicates the need for intervention and referral. There is a difference of 4 hours between the alert and the action line. By the time the action line is crossed, the woman should ideally have reached the FRU for receiving appropriate and timely intervention.
• Record the number of good contractions (lasting more than 20 seconds) in 10 minutes every half-an-hour and accordingly, blacken the boxes on the partograph.

Maternal condition
Record the maternal pulse and BP every half-an-hour and plot them on the graph. Record both the systolic and the diastolic BP using a vertical arrow, with the upper end of the arrow representing the systolic BP and the lower end indicating the diastolic BP. Use crosses to mark the pulse.

Intervention
Mention here any drug that you have administered during labour, including the dose and route of administration, and when. Also include the food items and liquids consumed by the woman during that period.
Management of the second stage of labour

• If the cervix is fully dilated or the perineum is thin and bulging with the anus gaping and the head of the baby visible at the vaginal introitus, it is the second stage of labour.

• Monitor the following every 5 minutes:
  * Frequency, duration and intensity of contractions
  * FHR
  * Perineal thinning and bulging
  * Visible descent of the foetal head during contractions
  * Presence of any signs indicating an emergency [see above in this chapter under “Management of the first stage of labour”]

• The upright positions such as standing, sitting, squatting and being on all fours makes pushing easier. Therefore, if the woman finds it difficult to push, or there is slow descent of the presenting part, you should change the position of the woman.

• The woman should be allowed to push down when she has contractions if she has the urge to do so during the second stage of labour.

• Bearing down efforts are required after the cervix is fully dilated, and even more so when the head is distending the perineum. Occasionally, the woman feels the urge to push before the cervix is fully dilated. This should be discouraged as it can result in oedema of the cervix which may delay the progress of labour.

• To prevent pushing at the end of the first stage of labour (before the cervix is fully dilated), teach the woman to pant, i.e. to breathe with an open mouth, take in two short breaths followed by a long breath out.

• Asking the woman to hold her breath and bear down in the second stage of labour should NOT be done. Holding the breath is potentially harmful. It may reduce the quantity of blood reaching the uterus and placenta. It may also reduce the supply of oxygen to the foetus.

• Giving the woman oxytocics to shorten the second stage of labour is NOT advisable.

• Avoid ironing the perineum (or using the “Sweep and stretch” technique) to hasten delivery.

• Episiotomy: There is no evidence that routine episiotomy decreases perineal damage, future vaginal prolapse or urinary incontinence. Remember, whenever an episiotomy is required, a right paramedian episiotomy is preferred [see Annexure 17: “Making and repairing an episiotomy”].

   Indications for conducting an episiotomy
   * Complicated vaginal delivery (refer to a higher health facility in case of a malpresentation)
   * H/o third- or fourth-degree perineal tears
   * Foetal distress
   * Instrumental/assisted delivery

• Ensure a controlled delivery of the head by taking the following precautions:
  * Encourage the woman to push only during pains (a contraction).
  * Keep one hand gently on the head as it advances with the contractions.
  * Support the perineum with the other hand during delivery and cover the anus with a pad held in position by the side of the hand.
Leave the perineum visible (between the thumb and the index finger).

Ask the mother to breathe steadily and to not push during delivery of the head.

Encourage rapid breathing with the mouth open.

Do NOT apply fundal pressure to hasten delivery of the head.

- Feel gently around the baby's neck for the presence of the umbilical cord around the neck. If the cord is present around the neck:
  - And if it is loose, deliver the baby through the loop of the cord, or slip the cord over the baby's head.
  - If the cord is tight, clamp it and cut the cord, and then unwind it from around the neck.

**Delivery of the shoulders and the rest of the baby**

- Wait for spontaneous rotation and delivery of the shoulders. This usually happens within 1-2 minutes.

- Perineal tears can be prevented by delivering one shoulder at a time. If there is difficulty in delivering the shoulder, suspect shoulder dystocia. Ask the woman to take a position with extreme flexion at the knees and hips with the knees wide apart. The shoulder may be released from behind the symphysis pubis and may deliver. If not, then refer the woman immediately to an FRU. Fortunately, shoulder dystocia is rare in India.

- Apply gentle pressure downwards to deliver the anterior shoulder.

- Then lift the baby up, towards the mother’s abdomen, to deliver the lower (posterior) shoulder.

- The rest of the baby's body smoothly follows out.

- Place the baby on the mother's abdomen or in the baby tray.

- Note the time of delivery.

**Cutting the cord:**

- Tie and cut the cord after 2-3 minutes of delivery, during which time the cord will normally stop pulsating. This will result in an increased amount of blood being transfused into the foetal circulation, and thus help in avoiding neonatal anaemia.

- Put ties tightly around the cord at 2 cm and 5 cm from the baby's abdomen.

- Cut between the ties with a sterile blade.

- Look for oozing of blood from the stump. If there is oozing, place a second tie between the baby's skin and the first tie.

- Give immediate newborn care.

- If the baby does not cry in 30 seconds, take steps to resuscitate the baby [see Module 1, Chapter 4: "Essential newborn care and basic newborn resuscitation"].

- Ensure warmth to the baby to prevent hypothermia.

- Rule out the presence of another baby by palpating the abdomen and trying to feel for foetal parts.

- It is recommended that the umbilical cord stump be left dry, and only routine daily care be given with clean safe water. Do not apply any substance to the stump.

- Note the Apgar score of the baby at 1 minute and at 5 minutes after delivery.

**Care of the newborn:** The newborn needs to be taken care of. The elements of essential newborn care are given in Box 5 [see also Module 1, Chapter 4: "Essential newborn care and basic newborn resuscitation"].
**Box 5. Elements of essential newborn care**

- Maintain the body temperature and prevent hypothermia
- Maintain the airway and breathing
- Breastfeed the newborn
- Take care of the cord
- Take care of the eyes
- Leave the baby on the mother's chest for skin-to-skin contact.
- Cover the baby to prevent loss of body heat. If the room is cool, use additional blankets to cover the mother and the baby.
- Encourage the mother to initiate breastfeeding.

**Active management of the third stage of labour**

The active management of the third stage of labour consists of the following three activities.

**Uterotonic drug**

Giving a uterotonic drug (one that enhances the contraction of the uterine muscles) has been shown to be effective in preventing PPH.

Although Inj. Oxytocin (in a dose of 10 U IM) is the drug of choice for preventing PPH, due to administrative difficulties, Misoprostol can now be used for the same purpose. Three tablets of 200 mcg each of Misoprostol (a total dose of 600 mcg) should be given immediately after delivery of the baby. It should be given either sublingually or orally.

Before giving Misoprostol, ensure that there is no additional baby(ies). This can be done by palpating the abdomen and ruling out the presence of foetal parts.

Administration of Misoprostol has a few common side-effects. These are not dangerous, and therefore should not cause worry. However, you must inform the mother and her companion(s), if any, about these to ease any apprehensions, should these side-effects occur. Shivering and gastrointestinal disturbance are common side-effects.

**Controlled cord traction (CCT)**

This is a technique to assist the expulsion of the placenta and helps to reduce the chances of a retained placenta and subsequent PPH. [see Annexure 9: "Procedure for controlled cord traction"].

Do NOT exert excessive traction on the cord while performing CCT. Never squeeze or push the uterus to deliver the placenta.

Examine the placenta carefully to ensure that none of the pieces are missing. Retained placental fragments or pieces of membrane will cause PPH. This can be suspected if a portion of the maternal surface of the placenta is missing or there are torn membranes with vessels. Ensure that the placenta is delivered completely with all the membranes. [see Annexure 11: "Examination of the placenta, membranes and the umbilical cord"].

**Uterine massage**

This technique helps in contraction of the uterus and thus prevents PPH. [see Annexure 10: "Procedure for uterine massage and expulsion of clots"].
Immediately after delivery of the baby, massage the uterus by placing your hand on the woman's abdomen until it is well contracted. Repeat the massage every 15 minutes for the first 2 hours. Ensure that the uterus does not become relaxed (soft) after the massage is stopped.

If the placenta is not delivered within 30 minutes of giving Misoprostol, and the woman is not bleeding, try and remove the placenta again by CCT. Empty the bladder, and encourage the woman to breastfeed.

If the placenta cannot be delivered after another 20 minutes, and the woman is not bleeding, empty the bladder, initiate breastfeeding and repeat CCT. The placenta may separate. If it does not separate and the woman is still not bleeding, refer her to an FRU. If the woman is bleeding, manage as given under "Retained placenta" [see Module 2, Chapter 1c: "PPH-Haemorrhage after childbirth"] and remove the placenta manually [see Annexure 20: "Procedure for manual removal of the placenta"]

**Immediate postpartum care**

- The first one hour after delivery of the placenta is sometimes referred to as the fourth stage of labour.
- After delivery of the placenta, check that the uterus is well contracted, i.e. it is hard and round, and there is no heavy bleeding. Repeat the checking every 5 minutes. If the uterus is not well contracted, massage the uterus and expel the clots. If bleeding continues even after 10 minutes, manage as given under "Postpartum haemorrhage" [see Module 2, Chapter 1c: "PPH-Haemorrhage after childbirth"].
- Examine the perineum, lower vagina and vulva for tears. If present, manage as given under "Vaginal and perineal tears" [see Module 2, Chapter 1c: "PPH-Haemorrhage after childbirth"].
- Estimate and record the amount of blood lost throughout the third stage and immediately afterwards. If the loss is around 250 ml, but the bleeding has stopped, observe the woman for the next 24 hours.
- Monitor the following every 10 minutes for the first 30 minutes, then every 15 minutes for the next 30 minutes, and then every 30 minutes for the next three hours:
  * BP, pulse, temperature
  * Vaginal bleeding
  * Uterus, to make sure that it is well contracted.
- Look for vaginal and/or perineal tears.
- Clean the woman and the area beneath her. Put a sanitary pad or a folded cloth under her buttocks to collect blood. This will also help in estimating the amount of blood lost, by counting the number of pads/cloths soaked. Help her change her clothes, if necessary.
- Ensure that the mother has enough sanitary napkins or clean cloths to collect the vaginal blood.
- Dispose of the placenta in the correct, safe and culturally appropriate manner. Use gloves while handling the placenta. Put the placenta into a leak-proof bag. Incinerate the placenta or bury it at least 10 m away from a water source, in a 2 m deep pit [Refer to the guidelines laid down by the state or your institution for the same].
- Keep the mother and the baby together; do not separate them. Encourage early breastfeeding.
- Encourage the woman to eat and drink, and rest.
- Encourage the woman to pass urine. If the woman has difficulty in passing urine, or the bladder is full (as evidenced by a swelling over the lower abdomen) and she is uncomfortable, help her pass urine by gently pouring water over her vulva.
• Weigh the baby.

• Ask the birth companion to stay with the mother. Do not leave the mother and the newborn alone. Ask the companion to watch the woman and call for help if any of the following occurs:
  * The bleeding increases.
  * The woman feels dizzy.
  * The woman has severe headache.
  * The woman has visual disturbance.
  * The woman has epigastric distress.
  * The woman complains of breathlessness.
  * The woman complains of increased abdominal or perineal pain.

• Enter the following information in the labour register:
  * Name of the woman
  * Age of the woman
  * Parity
  * ANC received (or not): mention the number of ANC visits received
  * Mode of delivery (normal or assisted)
  * Birth weight of the baby
  * Apgar score of the baby at 1 minute and 5 minutes after delivery.

• Do not discharge the woman before 24 hours after delivery. This is a crucial period for the occurrence and management of PPH. The woman must be kept under observation during this time.

Counselling

Counsel the woman regarding the aspects discussed below.

Postpartum care and hygiene

Advise and explain to the woman:

• To always have someone near her for the first 24 hours after delivery to respond to any change in her condition.

• Not to insert anything into the vagina.

• To wash the perineum daily and after passing stools. Wash in an anteroposterior direction from the vulva to the anus.

• To change the perineal pads every 4-6 hours, or more frequently, if there is heavy lochia.

• To wash cloth pads, if used, with plenty of soap and water and dry them in the sun.

• To bathe daily.

• To have enough rest and sleep. For the first 6 weeks postpartum, advise the woman to not do anything except look after herself and her baby.

• To avoid sexual intercourse for the first six weeks or until the perineal wound heals, whichever is later.

• To wash her hands before handling the baby.
Nutrition

- Advise the woman to eat a greater amount and variety of healthy foods. Give her examples of the types of food and how much to eat [see Module 1, Chapter 1: "Care during pregnancy-antenatal care"].
- Reassure the mother that she can eat normal food; these will not harm the breastfed baby.
- Spend more time on nutrition counselling with very thin women and adolescents.
- Determine if there are important food taboos, especially against foods that are nutritionally healthy. Advise the woman against these taboos.
- Talk to family members such as her husband and mother-in-law, to encourage them to help ensure that the woman eats enough and avoids heavy physical work.

Contraception

Advise the woman regarding birth spacing or limiting as the case may be [see Module 1, Chapter 1: "Care during pregnancy-antenatal care"].

Breastfeeding

[see Module 1, Chapter 1: "Care during pregnancy-antenatal care"]

Registration of birth

Emphasize to the woman that she must get the birth of the baby registered with the local Panchayat, or any other appropriate registering authority. This is a legal requirement. Also, the birth certificate issued is an important document stating the date of birth of the child, and is required for many purposes, e.g. to gain admission to a school.

Postpartum visit

- Inform the woman about the next routine postpartum visit.
- As the woman is kept under observation for the first 24 hours after delivery, the first postpartum visit is taken care of during her stay at the PHC/health facility.
- The second postpartum visit should be planned within 7-10 days after delivery. Either ask the ANM of that area to pay a visit to the woman and her baby, or ask the woman to return to the PHC for a postpartum check-up.
- If the woman misses her postpartum visits, inform her regarding the danger signs [see below] and when to return.

Danger signs

- For the following symptoms and signs in the mother, advise the woman and her family to go to an FRU immediately, day or night, WITHOUT WAITING.
  * Excessive vaginal bleeding, i.e. soaking more than 2 or 3 pads in 20-30 minutes after delivery, OR bleeding increases rather than decreases after the delivery
  * Convulsions
  * Fast or difficult breathing
  * Fever and weakness; inability to get out of bed
  * Severe abdominal pain
Advise the woman that she should visit you at the PHC as soon as possible, in case she suffers from any of the following symptoms:

- Fever
- Abdominal pain
- The woman feels ill
- Swollen, red or tender breasts, or sore nipples
- Dribbling of urine or painful micturition
- Pain in the perineum, or pus draining from the perineal area
- Foul-smelling lochia.
Research has shown that more than 50% of maternal deaths take place during the postpartum period. Conventionally, the first 42 days (6 weeks) after delivery are taken as the postpartum period. Of this, it is the first 48 hours, followed by the first one week, which are the most crucial periods for the health and survival of both the mother and her newborn, as most of the fatal and near-fatal maternal and neonatal complications arise during this period.

Of all the components of maternal and child health care delivery, postnatal care (PNC) and early newborn care are the most neglected components. Only 1 in 6 women receives care during the postpartum period in India. The National Family Health Survey-2 (NFHS-2) data indicate that only 17% of the women delivering at home were followed by a check-up within 2 months of delivery. Again, of those delivering at home, only 2% received postpartum care within 2 days of delivery, and an meagre 5% within the first 7 days. Even out of this minor fraction of women, most were not provided the entire range of information and services that should have been provided to a woman during a postpartum visit.

The following guidelines are meant for you, the M.O., who provides PNC at level of the PHC.

**Postnatal check-ups**

*The number and timing of PNC visits*

- The first 48 hours following delivery are the most critical in the entire postpartum period. Most of the important complications of the postpartum period which can lead to maternal death occur during these 48 hours. Hence, a woman who has just delivered needs to be closely monitored during the first 48 hours.

  If you have been involved in the delivery, make sure that the woman is not discharged before at least 24 hours have elapsed since delivery. Hence, the important complications, which are likely to occur during this period, can be taken care of. This has been described under immediate postpartum care [see Module 1, Chapter 2: "Care during labour and delivery-intrapartum care"].

  However, if you have not been involved in conducting the delivery, and the woman visits you for postpartum care, take a history and do a quick examination, as described later. Find out who attended the delivery and ask the birth attendant about the delivery. If she is not an SBA (for example, she might be a relative of the patient, or a TBA), and she is staying with the woman during the initial postpartum period, explain to her about the possible complications that could arise, the symptoms and signs to watch for, and the necessary action to be taken, including referral.

- The next most critical period is the first week following delivery. A substantial number of complications can occur during this period, both for the mother as well as for the baby. Hence, ask the mother to pay another visit on day 3rd and day 7th, or ask the ANM in charge of that area to pay a home visit during this period.

*The first postpartum visit*

As explained earlier, the first postpartum visit should take place within the first 24 hours after delivery.

*History-taking*

The following questions should be asked to the woman during the first visit. This is especially important if you were not present for the delivery, and this is your first postnatal visit to the woman. Ask the woman:

- Where did the delivery take place?
- Who conducted the delivery?
Maternal symptoms

Ask for the following symptoms:

- **H/o heavy bleeding P/V:** This is important to assess the presence of immediate PPH. Though PPH is defined as vaginal bleeding in excess of 500 ml after childbirth, it is not practically useful in judging for the presence of PPH. Hence, a more practical question would be to ask the woman about the number of pads or cloth pieces getting soaked with blood. If the woman is bleeding heavily, i.e. she soaks a pad or cloth in <5 minutes, it indicates immediate PPH. It requires urgent management and referral [see Module 2, Chapter 1c: "PPH- Haemorrhage after childbirth"].
- **H/o convulsions or loss of consciousness**
- **H/o abdominal pain**
- **H/o fever**

Examination

- Check the pulse, BP, temperature.
- Look for pallor.
- Examine the abdomen to see if the uterus is well contracted (hard and round) and to rule out the presence of any uterine tenderness.
- Examine the vulva and the perineum for the presence of any foul-smelling lochia, tear, swelling or pus discharge.
- Examine the pad for bleeding and assess if it is heavy, or there is any purulent discharge mixed with blood (indicative of sepsis).

Neonatal symptoms

Check for signs of Possible serious bacterial Infection and take appropriate action

- **Convulsions:** Ask the mother if young infant has convulsions.
- **Not able to feed:**
- **Fast breathing:** Breathing rate of 60 or more breaths per minute is taken as ‘fast breathing’ in a young infant. If the first count is 60 or more, repeat the count. If the second time also the breathing rate is 60 breaths or more, the young infant has ‘fast breathing’.
- **Severe chest indrawing:** Mild chest indrawing is normal in young infant because the chest wall is soft. Severe chest indrawing is quite deep and easy to see.
- **Nasal flaring:** Nasal flaring is widening of the nostrils when the young infant breathes in.
- **Grunting:** This is the soft, short sounds a young infant makes when breathing out, when an infant is having trouble breathing.
- **Feels hot or unusually cold:** Feel the ‘infant’ stomach or axilla (underarm) and determine if it feels hot or unusually cold. 10 or more skin pustules or a big boil.
- **Lethargic or unconscious:** A lethargic young infant is not awake and alert when she should be and is difficult to awake by stimulation or has movements less than normal. An unconscious infant cannot be wakened at all.
- **Blood in stool.**

If any one sign is present, Refer the child

- Explain the need for referral
- Calm her fears and discuss possible solutions for any difficulty in referral
- Advise the mother to continue to breast feed the baby and keep the sick young infant warm
- Write a referral slip

* Give first dose of cotrimoxazole if able to take orally (½ Pediatric tablet for an infant upto 1 month and 1 tablet for an infant 1-2 months)
For chest indrawing to be present, it must be clearly visible and present all the time. If you only see chest indrawing when the young infant is crying or feeding, the young infant does not have chest indrawing.

**Check for feeding problem**

| Not able to feed: If a mother says that the infant is not able to feed, watch her try to feed the infant to confirm if infant is able to feed, or No attachment at all or Not sucking at all |
|-----------------|--------------------------------------------------|
| Not well attached to breast or not suckling effectively or Less than 8 breastfeeds in 24 hours |
| Receives other foods or drinks or Thrush (ulcers or white patches in mouth), Breast or nipple problems |
| No other signs of inadequate feeding. |

* Warm the young infant by Skin to Skin contact if feels cold to touch.
* Refer URGENTLY to hospital
* If not well attached or not suckling effectively, teach correct positioning and attachment.
* If breastfeeding less than 8 times in 24 hours, advise to increase frequency of feeding.
* If receiving other foods or drinks, counsel mother about breastfeeding more, reducing other foods or drinks, and using a cup and spoon.
  * If not breastfeeding at all, advise mother about giving locally appropriate animal milk and teach the mother to feed with a cup and spoon.
* If thrush, teach the mother to apply 0.25% Gentian Violet paint twice daily
* If breast or nipple problem, teach the mother to treat breast or nipple problems.
* Advise mother to give home care (Breastfeed infant exclusively, keep infant warm, apply nothing to cord, ask mother to wash hands and explain danger signs in the infant)
* Follow-up in 2 days.
* Advise mother home care
* Praise the mother for feeding the infant well.

**Umbilical redness or umbilicus draining pus OR Skin pustules (Less than 10 skin pustules)**

* Give oral co-trimoxazole (or amoxicillin) for 5 days
* Teach the mother to apply GV paint twice daily for skin pustules and umbilical infection
* Advise mother to give home care for the young infant

Record weight and decide the schedule of subsequent home visits
The schedule of subsequent visits is based on birth weight. The recommended schedule for home visits is outlined below:

<table>
<thead>
<tr>
<th>All babies</th>
<th>3, 7 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low birth weight babies (weight less than 2.5 kg)</td>
<td>3, 7, 14, 21 and 28 days</td>
</tr>
</tbody>
</table>

**Advise the Mother and the Family on Home Care**

Home care advice includes the following:

To breastfeed the infant frequently, as often and as long as the infant wants, day and night, during sickness and health. Ask the mother if she has already put the infant to the breast. If the mother has already started breastfeeding, praise the mother for starting the breastfeeding in time. If the mother has not yet started breastfeeding, prepare her to put the infant to the breast. Talk to the mother to answer any questions about breastfeeding that she may have.

Emphasize the importance of exclusive breastfeeding and counsel her against giving any other foods or fluids other than breast milk. Remember to tell her that no extra water is required for an exclusively breast-fed baby even if in hot weather. There is always enough water in breast milk to protect the baby from getting dehydrated.

**How to keep the baby warm**

To ensure that the infant is kept warm at all times. It is important to keep the young infant warm. Low temperature has an adverse impact on the sick young infant and increases the risk of death.

The best way to maintain temperature or warm a baby with low temperature is by placing the baby in skin-to-skin contact with the mother (or any adult). Skin to skin contact can also be used to keep a baby warm during transport and at home.

**Teach the mother how to keep the young infant warm**:

- Provide Skin to Skin contact (Kangaroo mother care) as much as possible, day and night.
  - Provide privacy to the mother.
  - Request the mother to sit or recline comfortably.
  - Undress the baby gently, except for cap, nappy and socks.
  - Place the baby prone on mother’s chest in an upright and extended posture, between her breasts, in Skin to Skin contact; turn baby’s head to one side to keep airways clear.
  - Cover the baby with mother’s blouse, ‘pallu’ or gown; wrap the baby-mother duo with an added blanket or shawl.
  - Breastfeed the baby frequently.
  - If possible, warm the room with a heating device.
  - If mother is not available, Skin to Skin contact may be provided by the father or any other adult.

- When Skin to Skin contact not possible:
  - Keep the room warm with a home heating device
  - Clothe the baby in 1-2 layers (Summer)
- Clothe the baby in 3-4 layers (Winter) and cover the head, hands and feet with cap, gloves and socks respectively
- Let the baby and mother lie together on a soft, thick bedding
- Cover the baby and the mother with additional quilt, blanket or shawl in cold weather

- Advise mother to wash hands with soap and water, after defecation and after cleaning the bottom of the baby
- Advise the mother not to apply anything on the cord and keep the cord and umbilicus dry.
- Also teach the mother when to return immediately. The signs mentioned below are particularly important signs to watch for. Teach the mother these signs. Use local terms that the mother can understand. Circle the signs that the mother must remember. Ask her checking questions to be sure she knows when to return immediately.

**When to Return Immediately:**

<table>
<thead>
<tr>
<th>Advises the mother to return immediately if the young infant has any of these signs:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Breastfeeding or drinking poorly</td>
</tr>
<tr>
<td>- Becomes sicker</td>
</tr>
<tr>
<td>- Develops a fever or feels cold to touch</td>
</tr>
<tr>
<td>- Fast breathing</td>
</tr>
<tr>
<td>- Difficult breathing</td>
</tr>
<tr>
<td>- Blood in stool</td>
</tr>
</tbody>
</table>

Young Infant must be kept warm
The second and third postpartum visits

As mentioned earlier, the second and third postpartum visits should take place on the 3rd and 7th day respectively, following delivery.

History-taking

A similar history needs to be taken again [see above under "The first postpartum visit"], except for a few additional questions that should be asked [see below].

Maternal symptoms

Ask the woman for the following:

- Continued bleeding P/V: This is known as "delayed PPH", i.e. postpartum bleeding occurring 24 hours or more after delivery. Manage accordingly [see Module 2, Chapter 1c: "PPH-Haemorrhage after childbirth"].
- H/o foul-smelling vaginal discharge: This could be indicative of puerperal sepsis. Manage accordingly [see Module 2, Chapter 4: "Puerperal sepsis"].
- H/o swelling (engorgement) and/or tenderness of the breasts. If present, manage accordingly [see Module 2, Chapter 8b: "Breast problems: Mastitis and breast abscess"].
- H/o pain or any problems while passing urine (dribbling or leaking).
- H/o easy fatiguability and "not feeling well".
- H/o feeling unhappy or crying easily. This indicates postpartum depression, and usually occurs after the first week of delivery.

Examination

This is similar to the examination conducted during the first visit. It includes the following:

- Check the pulse, BP, temperature
- Look for pallor
- Examine the abdomen to see if the uterus is well contracted (hard and round) and to rule out the presence of any uterine tenderness.
- Examine the vulva and the perineum for the presence of any tear, swelling or pus discharge.
- Examine the pad for bleeding and lochia. Assess if it is profuse and whether it is foul-smelling.
- Examine the breasts for the presence of any lumps or tenderness.
- Check the condition of the nipples. If they are cracked or sore, manage as given under the management of "Sore and cracked nipples" [see Module 2, Chapter 8b: "Breast problems: Mastitis and breast abscess"].

Neonatal symptoms

Follow the instructions given above for the first home visit at the subsequent visits also.

There is no need to take weight at these visits if the infant is well and is not low birth weight. At the last scheduled home visit, ensure that you advise the mother to continue exclusive breastfeeding up to 6 months and go for BCG, DPT, OPV and Hepatitis B immunization at 6 weeks of age.
Counselling

Diet and rest

- Inform the woman that during lactation she needs approximately 550 kcal extra in a day during the first 6 months, and then 400 kcal extra during the next 6 months, compared to her pre-pregnancy diet. This is not only because she needs to regain her strength, but also because during the period of exclusive breastfeeding, the baby relies solely on her for his/her nutritional requirements. [see Module 1, Chapter 1: "Diet chart during pregnancy and lactation"].
- Foods rich in calories, proteins, iron, vitamins and other micronutrients should be advocated.
- Food taboos immediately postpartum and during lactation are usually stronger and more in number than during pregnancy. These should be enquired into and, if they are harming the woman and/or her baby, she should be advised against them.
- The woman needs sufficient rest during the postpartum period to be able to regain her strength. She and her husband and other family members should be advised that she should not be allowed to do any heavy work during the postpartum period, except for looking after herself and her baby.

Resumption of sex

The couple should be advised to abstain from having sex during the first 6 weeks following delivery, or till the perineal/episiotomy wound heals (if present), whichever is later. This is to allow the genitalia and the reproductive organs to involute to their original size. Women have relative hypo-oestrogenaemia during the postpartum period. This will result in a lack of vaginal lubrication; such a dry vagina will make the act of intercourse painful for the woman.

Contraception

- This issue must be emphasized again. Remind the woman that whenever she restarts her menses, and/or stops exclusive breastfeeding, she can conceive even after a single act of unprotected sex [see Module 1, Chapter 1: "Care during pregnancy-antenatal care"].
- The various choices of contraceptive methods available to the couple must be told to them, so that they can make an informed choice.

Infant and young child feeding

The issues that need to be discussed and the woman counselled about have been detailed above. In addition, the following points about feeding the child should be discussed [see Module 1, Chapter 1: "Care during pregnancy-antenatal care"].
- Breastfeeding should be initiated early.
- Pre-lacteal feeds should not be given.
- Colostrum should be fed to the baby.
- Exclusive breastfeeding is mandatory for 6 months.
- Demand feeding should be given.
- Rooming in should be encouraged.
- Weaning should start at 6 months of age.
Infant care
It is important to remove the apprehensions of the woman related to caring for the baby, especially if she is a first-time mother. You must talk to the mother about:

• Child development and milestones; what are delayed milestones, and when to seek help for the same
• Maintaining the hygiene of the baby
• Feeding the baby
• When and where to seek help in case of illness. Explain the danger signs in the newborn to the mother [see Module 1, Chapter 4: "Essential newborn care and basic newborn resuscitation"].
• How to interact with the child, etc.
Essential newborn care

Care of the newborn at birth is primarily aimed at helping the newborn to adapt to the extrauterine environment. Physiological adaptation includes:

- Initiation of respiration and oxygenation of the arterial blood
- Temperature adaptation
- Initiation of feeding.

Preparing for birth

Make sure that the following materials/conditions are available for the newborn:

- Two clean and warm towels for thermal protection of the baby; one for drying and wrapping the baby initially, the other for covering the newborn to prevent heat loss
- A draught-free delivery room with a temperature of at least 25 °C
- Soap, water, clean gloves, cotton, gauze and a clean labour table for delivery to ensure the six "cleans" (i.e. clean hands, clean surface, clean cord cut, clean cord tie, clean cord stump and clean perineum) during delivery
- A clean delivery kit for cord care
- Self-inflating bags (two, of a size appropriate for a newborn) and masks (sizes zero and one) for resuscitation
- A suction device (mucus extractor)
- A radiant heater
- A blanket
- A clock/watch to note the time of delivery.

Always keep an additional set of equipment in reserve for multiple births (twins, etc.) or in case of failure of the first set.

Routine care at birth

Over 90% of newborns do not require any active resuscitation at birth. Efforts are directed to maintain asepsis, prevent infection and hypothermia, and to keep the airway patent.

Asepsis

Wash your hands with soap and water when preparing for the birth. Use gloves. Deliver the newborn under aseptic conditions. Note the time (hour and minute) of birth.

Clamping of the cord

Clamp the umbilical cord 2-3 minutes after the neonate is delivered completely. Wait till the cord stops pulsating before clamping and cutting it. This precaution will allow an extra amount of blood to be transfused into the neonate and thus prevent neonatal anaemia. However, early and immediate clamping of the cord is recommended in newborns with severe birth asphyxia, cord around the neck and rhesus iso-immunization.
Care of the cord

The umbilical cord must be cut with a pair of sterile scissors/blade 2.5 inches from the abdominal skin surface. There is no evidence that the local use of antiseptics over the umbilical stump prevents infection. Hence, you are advised to leave the stump dry, without applying any antiseptics.

**Box 6. Care of the umbilical stump**

- Inspect the cord for bleeding 2 hours after ligation.
- Do NOT apply anything on the stump; keep the cord clean and dry.
- Inspect for discharge or infection till healing occurs.

Maintaining the body temperature

Newborns may be hypothermic at birth. Hypothermia is a body temperature of <36 °C [see Annexure 12: "Measuring the body temperature in the newborn"]). Hypothermia results in increased oxygen consumption and hypoxaemia, increased glucose consumption, and hypoglycaemia and metabolic acidosis. Hypoxaemia and hypoglycaemia can result in the death of the newborn. Among survivors, it can lead to permanent impairment of the brain resulting in developmental handicaps.

Heat loss at birth can be prevented by the following simple interventions:

- Receive the baby in a dry, warm, clean towel. Dry the baby well. While drying, make sure that the head is in a neutral position, neither too sharply flexed nor extended. Discard the wet towel immediately and wrap/cover the baby (except for the face and upper chest) in a fresh, clean dry towel. The baby should be kept wrapped during the assessment and suction ventilation applied (if required) to prevent heat loss.

- Place the baby near a source of warmth. A normal baby, who is crying well after birth, can be placed in skin-to-skin contact with the mother's abdomen and covered with a dry cloth. The maternal body heat will provide the extra warmth required. It is also an additional assurance to the mother of the baby's well-being.

- In a PHC setting, additional heat can be provided by placing the baby under a source of heat such as a lamp with a 200 Watt bulb or under a radiant warmer.

- Ensure that during and after the delivery, no fans are running in the delivery room, and no windows are open through which air currents blow into the room.

- Bathing the newborn soon after birth is not recommended as it causes a drop in the body temperature. While the baby needs to be kept clean, discourage the mother from giving bath to the baby during the first day after birth. The mother or the birth attendant can clean the baby by wiping with a soft moist cloth. When the baby is given a bath, bathing should be done quickly in a warm room, using warm water. Low birth weight infants should not be given a bath. Instead, clean the baby with a soft, clean cloth soaked in lukewarm water. Blood, meconium and some of the vernix will have been wiped off during drying at birth. The remaining vernix does not need to be removed as it is harmless, may reduce heat loss and is reabsorbed through the skin during the first few days of life. If cultural tradition demands bathing, this should not be carried out before 6 hours after birth, and preferably on the second or third day of life as long as the baby is healthy and its temperature normal.
Airway and breathing

If the baby is crying and the breathing is normal, resuscitation is not needed. Provide normal care and clear the upper airway by wiping the nose and mouth of the baby, and removing the secretions present therein. If the baby is not crying, assess the breathing; if the chest is rising symmetrically and the RR is >30 breaths/minute, no immediate action is needed. Remember, occasional gasps are not considered breathing.

Care of the skin

Clean the blood, mucus and meconium on the newborn’s body before presenting it to the mother. Bathing babies soon after birth is not recommended. Postpone the first bath for the next day. Ensure that the baby’s temperature is normal before giving a bath.

Care of the eyes

The eyes should be cleaned at birth and once every day using sterile cotton swabs soaked in sterile water or normal saline. Each eye should be cleaned using a separate swab. The routine use of local antiseptic drops for prophylaxis is not recommended.

Feeding

Initiate breastfeeding within one hour of a normal delivery. Ensure that the baby is suckling well. If suckling is poor, ensure correct positioning and attachment of the baby to the breast. [see Module 1, Chapter 1: "Care during pregnancy-antenatal care"]

Apgar score

The Apgar score indicates the newborn’s well-being. It should be calculated at 1 minute and at 5 minutes after birth. Table 2 gives the criteria for calculating the Apgar score. An Apgar score of >7 is considered satisfactory.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory effort</td>
<td>Absent</td>
<td>Gasping</td>
<td>Good cry</td>
</tr>
<tr>
<td>Heart rate</td>
<td>Zero</td>
<td>&lt;100/minute</td>
<td>&gt;100/minute</td>
</tr>
<tr>
<td>Colour (cyanosis)</td>
<td>Central cyanosis</td>
<td>Peripheral cyanosis</td>
<td>Pink</td>
</tr>
<tr>
<td>Muscle tone</td>
<td>Flaccid</td>
<td>Partial flexion of the extremities</td>
<td>Complete flexion</td>
</tr>
<tr>
<td>Reflex (response to nasal catheter)</td>
<td>None</td>
<td>Grimace</td>
<td>Sneeze</td>
</tr>
</tbody>
</table>

Box 7. Essential postnatal care

- Nurse in thermal comfort (the baby should be warm to the touch at the abdomen and pink in the soles of the feet.
- Check the umbilicus, skin and eyes.
- Ensure good suckling at the breast.
- Screen for danger signs.
- Advise the family, especially the mother, on immunization.
Danger signs in a newborn

Also teach the mother **when to return immediately**. The signs mentioned below are particularly important signs to watch for. Teach the mother these signs. Use local terms that the mother can understand. Circle the signs that the mother must remember. Ask her checking questions to be sure she knows when to return immediately.

<table>
<thead>
<tr>
<th>When to Return Immediately:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advise the mother to return immediately if the young infant has any of these signs:</td>
</tr>
<tr>
<td>• Breastfeeding or drinking poorly</td>
</tr>
<tr>
<td>• Becomes sicker</td>
</tr>
<tr>
<td>• Develops a fever or feels cold to touch</td>
</tr>
<tr>
<td>• Fast breathing</td>
</tr>
<tr>
<td>• Difficult breathing</td>
</tr>
<tr>
<td>• Blood in stool</td>
</tr>
</tbody>
</table>

Basic newborn resuscitation

Effective basic resuscitation will revive more than 75% of newborns with birth asphyxia.

Preparation for resuscitation

- Be prepared for every birth by having the skill and the equipment to resuscitate (see Annexure 13: *Equipment for newborn resuscitation*). Review the risk factors for birth asphyxia. Get help if necessary and if possible.
- Clearly delegate responsibilities to each health care provider during resuscitation.

Birth asphyxia

It is estimated that 4%-6% of babies fail to establish breathing at birth. Birth asphyxia is the second most common cause of neonatal mortality next to septicaemia. In survivors, it can lead to neuromotor and mental handicap in childhood. Most instances of birth asphyxia are associated with foetal distress occurring due to intrapartum complications such as cord-related problems, abruptio placentae, obstructed labour, hypertension, placental insufficiency and growth retardation.

Defining birth asphyxia

Traditionally, birth asphyxia is defined on the basis of the Apgar score. An Apgar score of <7 at 1 minute is considered as birth asphyxia. Clinically, you can recognize a newborn with asphyxia as one who is not breathing or is gasping at birth. Such a baby needs immediate resuscitation.

Initial assessment

The initial assessment should be performed within a few seconds. It helps to determine whether or not some degree of resuscitation is required for the newborn. The five questions to ask are:

- Is the amniotic fluid clear of meconium?
- Is the baby breathing or crying normally?
• Is the muscle tone good?
• Is the colour of the baby pink?
• Was the baby born at term?

If the answer to any of these questions is "NO", i.e. if there was meconium-stained amniotic fluid, or the baby did not cry/breathe spontaneously, is limp, centrally cyanosed, or born preterm, then you need to immediately begin the initial steps of resuscitation.

Managing birth asphyxia

Meconium-stained amniotic fluid

If meconium is present in the amniotic fluid, apply suction to ensure that it is removed from the mouth, posterior pharynx and nose before delivery of the shoulders.

Suction apparatus: These could be either De Lee mucus traps, foot or electrically operated suction machines. While using electrical suction machines, care must be taken that the pressure does not exceed 100 mm Hg.

De Lee suction mucus trap

Tactile stimulation

If necessary, appropriate forms of tactile stimulation (gently rubbing the baby’s back, flicking the soles of the feet) may be provided. Avoid the continued use of tactile stimulation in an apnoeic newborn, as this will waste valuable time.

Heart rate

In a newborn, the heart rate is counted in preference to the pulse rate. This is because the peripheral pulses are not as readily palpable in a newborn as in an adult. The heart rate of the baby should be assessed by auscultation. If the heart rhythm is regular, count the heart beats for 6 seconds only. Multiply the figure by 10 to get the heart rate/minute. The normal heart rate of the newborn is between 110 and 160 beats/minute. If the heart rate is less than 100 beats/minute, it indicates the need for assisted ventilation.
Open the airway - position and suction

Place the baby on a dry, clean and, if possible, warm surface next to the mother. Put the baby on its back. Position the head so that the neck is slightly extended. A folded piece of cloth or a shoulder towel (approximately ½ to ¾ inch thick) placed under the shoulders may help. Clear the airway by suctioning first the mouth and then the nose. A mucus trap or a foot-operated suction machine may be used for the same [see Annexure 13: "Equipment for newborn resuscitation"]. Be especially thorough with the suction if there is blood or meconium in the baby's mouth and/or nose. The newborn may start breathing after suction itself because the procedure provides additional stimulation. If this happens, no further action is needed immediately. If there is still no breathing, start artificial ventilation.

Assisted ventilation

Assisted ventilation is indicated in any apnoeic baby who is not responding to tactile stimulation, or any baby who, though breathing, has a heart rate of <100 beats/minute. Ventilation may be provided either with a bag and mask or a bag and an endotracheal tube.

Infant resuscitation bag (Self inflating type)

The volume of the bag for neonatal use must be between 240-750 ml. It must have a facility for connecting an oxygen source and an oxygen reservoir. A safety pop-off valve (set at 40 cm water) is desirable as it will protect against delivery of unduly high inspiratory pressures to the neonatal lungs (which could result in pneumothorax). The bag must have two masks of size 0 (for preterm) and 1 (for term newborns).

Reposition the newborn-make sure that the neck is slightly extended. Place the mask on the newborn's face so that it covers the chin, mouth and nose, forming a seal between the mask and the face. Attach the bag to the mask. Squeeze the bag with two fingers only or with the whole hand, depending on the size of the bag and the manufacturer's instructions. Check the seal of the fit between the face and mask by ventilating two or three times and observing for a rise of the chest.

The procedure of bag and mask ventilation mask should enclose both nose and mouth resting snugly over the chin and just below the eyes. There should be gentle but visible rise and fall of chest with each inflation.
If the chest is not rising, the most probable reasons and the required corrective measures to be taken are given in Table 3.

**Table 3. Reasons and corrective measures to be taken for improper ventilation**

<table>
<thead>
<tr>
<th>Reasons for improper ventilation</th>
<th>Corrective measures required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inappropriate head position</td>
<td>• Reposition the newborn, making sure that the neck is slightly extended.</td>
</tr>
<tr>
<td>Poor seal between the mask and face</td>
<td>• Ensure that the mask is of the correct size. Reposition the face mask ensuring that it fully covers the baby's chin, mouth and nose.</td>
</tr>
<tr>
<td>Insufficient ventilation pressure due to leak in the bag or application of insufficient pressure</td>
<td>• Check for any leak in the bag; if present, change the bag.</td>
</tr>
<tr>
<td></td>
<td>• Increase the ventilation pressure by pressing the bag with the whole hand; exactly how much to press will depend on the size of the bag. The first ventilation will usually require a higher inflation pressure than subsequent ventilations.</td>
</tr>
<tr>
<td>Mucus, blood or meconium in the airway</td>
<td>• Further suction the upper airway.</td>
</tr>
<tr>
<td>Lung pathology in the baby</td>
<td>• Consider the need to intubate the baby.</td>
</tr>
<tr>
<td></td>
<td>• Manage the lung pathology depending on the diagnosis.</td>
</tr>
</tbody>
</table>

Once the seal is ensured and chest movement is present, ventilate the newborn at a frequency of about 40 breaths/minute, the range being 30-60 breaths/minute (better more than less). After effectively ventilating for about 1 minute, give a pause but do not remove the mask and bag and look for spontaneous breathing. If there is none, or it is weak, continue ventilating until spontaneous crying/breathing begins. Observe the chest for an easy rise and fall. Hold the head in the correct position to keep the airway open during ventilation and keep a tight seal between the mask and face. Continue ventilation. If oxygen is available, give oxygen @ 0.5 L/minute.

**Indications** to intubate baby at birth include:

a. Meconium stained baby who is not vigorous
b. Non-response to Bag and mask ventilation
c. Suspected congenital Diaphragmatic hernia

Response to assisted ventilation is assessed 30 seconds after initiating ventilation. **Good response to assisted ventilation** (it is also an indication to discontinue assisted ventilation) is indicated by:

a. Appearance of spontaneous respiratory effort.
b. Heart rate > 100 beats/min
c. Pink colour

Once the newborn starts crying, stop ventilation but do not leave the newborn. Observe the breathing when it stops crying; if

- the breathing is normal (spontaneous respiratory effort) and the respiratory rate is 30-60 breaths/minute, and
- there is no chest or intercostal indrawing, and
- no grunting,
- the heart rate is >100 beats/minute and
- the colour of the baby is pink
All for one minute, then no further resuscitation is needed. Put the newborn in skin-to-skin contact with the mother’s chest to prevent heat loss.

However, if the breathing is slow (RR is <30 breaths/minute), or if there is severe indrawing, or the heart rate is between 60 and 100 beats/minute, continue ventilation. If the heart rate increases to >100 beats/minute, discontinue ventilation by gradually decreasing the rate and pressure of ventilation. Observe the heart rate and RR every 30 seconds. If the heart rate remains <60 beats/minute after the initial 30 seconds of assisted ventilation, initiate chest compression (cardiac massage).

**Laryngoscope:** Laryngoscopes for neonatal use must have a straight blade. There must always be a set of fresh batteries in the kit to ensure sufficient light intensity during endotracheal intubation.

**Endotracheal tubes:** The endotracheal tubes (with adapter) should be of the following sizes (internal diameter):

- 2.5 mm - for birth weight < 1000 gm
- 3.0 mm - for birth weight 1000-2000 gm
- 3.5 mm - for birth weight 2000-3000 gm
- 4.0 mm - for birth weight > 3000 gm

One may need to have a stylet to keep the tube stiff during intubation.

**Chest compression (cardiac massage)**

Chest compression is indicated whenever the heart rate of the newborn is <60 beats/minute despite assisted ventilation.

During this process, at least two trained personnel are needed, one for assisted ventilation and the other for cardiac compression.

**Procedure for chest compression**

1. Place the baby on a firm surface.
2. Identify the lower one-third of the sternum (i.e. the area between the inter-nipple line and the xiphisternum).
3. Use the index and the middle fingers for compression. Compress the sternum by one-third of the anteroposterior diameter of the chest @ 90 times/minute.
4. Ensure coordination between ventilation and cardiac massage; for every 3 chest compressions, offer one assisted ventilation, i.e. a ratio of 3:1.
5. Assess the response to cardiac massage and ventilation by counting the RR and the heart rate and check whether spontaneous respiration has been established.
6. Chest compression can be discontinued when the heart rate rises to >60 beats/minute.

**Drugs for newborn resuscitation**

1. **Adrenaline:** Adrenaline is to be prescribed whenever the heart rate remains <60 beats/minute despite chest compression and assisted ventilation. The dose of Adrenaline is 0.1 ml/kg body weight of a 1:10,000 solution. The route of administration can be intracardiac or intravenous (IV). The dose can be repeated after 3-5 minutes, if the heart rate does not increase.
2. **Sodium bicarbonate**: This drug is indicated in cases of metabolic acidosis. If, even after 5 minutes of assisted ventilation, cardiac compression and drugs, the newborn is apnoeic or gasping and has a heart rate <100 beats/minute, give this drug. The dose of sodium bicarbonate is 2 ml/kg, diluted with an equal amount of distilled water. It is to be given slow IV, over a period of 2-3 minutes.

3. **Normal saline**: It is indicated in newborns who are in shock, i.e. their pulse is weak, and peripheral cyanosis and cold extremities are present. Shock in the newborn at birth can be the result of blood loss due to cord rupture, abruptio placentae or foeto-maternal haemorrhage. It can also be due to cardiac dysfunction due to severe intrapartum asphyxia. The dose of normal saline is 10 ml/kg body weight, given IV.

**Referring the newborn to an FRU**

Check on the arrangement for referral. A newborn will benefit from referral to a higher centre only if it is properly ventilated and kept warm during transport. Two people are needed to escort a newborn who requires ventilation: one person will continue to ventilate the baby while the other will assist with other tasks. If possible, transfer for the mother should also be arranged alongside.

**Stopping resuscitation**

Despite complete and adequate resuscitation efforts, some newborns may undergo brain death if the heart rate is absent at 15 minutes. Therefore, an absent heart sound, even after 15 minutes, is an absolute indication to stop resuscitation. If there is no gasping or breathing at all even after 20 minutes of effective ventilation (and cardiac massage, if required), stop ventilation. However, if there was gasping but no spontaneous breathing, try ventilation for 30 minutes. If spontaneous breathing is not established even by then, stop ventilation. After cessation of resuscitation, explain to the mother what you did and the result of your action(s).

**Resuscitation practices that are either not effective or are harmful**

These include:

- Routine aspiration (suction) of the baby's mouth and nose as soon as the head is delivered or later, when the amniotic fluid is clear;
- Routine aspiration (suction) of the baby's stomach at birth;
- Stimulation of the newborn by slapping or by flicking the soles of its feet;
- Postural drainage and slapping the back;
- Squeezing the chest to remove secretions from the airways;
- Routine administration of sodium bicarbonate to newborns who are not breathing;
- Intubation by an unskilled person.

**Care after successful resuscitation**

Do not separate the mother and the newborn. Leave the newborn in skin-to-skin contact with the mother.

After taking care of the mother's needs, examine the newborn. Measure the newborn's body temperature, count the rate of breathing, observe for indrawing and grunting, and look for any malformation, birth injury, etc.

Encourage breastfeeding within half an hour of birth. The newborn who needs resuscitation is at a higher risk of developing hypoglycaemia. Observe suckling—good suckling is a sign of recovery.
If the body temperature is <36 °C or the skin feels cold, the baby has hypothermia. Skin-to-skin contact will rewarm the newborn. For rewarming, cover the newborn with an additional cloth or blanket. The mother will need to observe the breathing and movement. Check the body temperature every hour until it becomes normal. Small babies must be observed more carefully as danger signs that indicate serious problems are more common and more subtle in them.

If the newborn has difficulty in breathing or there are other danger signs, organize referral for special care. Explain the findings of the examination to the mother. Refer the newborn with the mother if possible.

Record the resuscitation and problems, if any. Examine the newborn before discharge. A normal body temperature, normal breathing, occasional cry, good suckling and movements are signs of the newborn’s well-being. Discuss the procedure again with the parents. Explain that although complications are unlikely there is a small probability that the newborn will have problems such as difficulty in feeding or convulsions in the first few days of life. Instruct them to take the newborn to the hospital if these problems occur.

**Risk identification in the newborn**

An important task of the attending MO in the labour room is the identification of newborns at high risk for morbidity and mortality. These newborns would need special care, either at the PHC where the delivery took place (if the facilities and trained personnel exist) or at the FRU where these babies should be referred to. Guidelines to detect these newborns at risk are given below.

1. **Birth asphyxia:** Newborns who are asphyxiated at birth, especially those who do not establish spontaneous respiration by 5 minutes of birth would need referral to an FRU which is equipped to manage post-asphyxial problems such as convulsions, hypoxia, hypoglycaemia, hypocalcaemia, shock, renal failure etc.

2. **Danger Signs:** Newborn with following signs would need referral to an FRU which has facilities for newborn care.
   - Convulsions
   - Fast breathing (60 breaths per minute or more)
   - Severe chest indrawing
   - Nasal flaring
   - Grunting
   - Bulging fontanelle
   - 10 or more skin pustules or a big boil
   - If axillary temperature 37.5°C or above (or feels hot to touch) or temperature less than 35.5°C (or feels cold to touch)
   - Lethargic or unconscious
   - Less than normal movements
   - Severe Jaundice
   - Blood in the stools
   - Not able to feed
   - No attachment at all
   - Not sucking at all
3. **Major Malformations**: Newborns with major malformations such as a meningomyelocele, hydrocephalus, or anterior abdominal wall defects such as a large omphalocele are easily identified on inspection of the baby. Diaphragmatic hernia may be suspected in a baby with respiratory distress and a scaphoid abdomen. Babies with excessive salivation and mucus discharge from the oral cavity may have oesophageal atresia. There is an inability to pass a rubber catheter into the stomach. Most of these babies require immediate surgery for them to survive, and therefore should be referred to an FRU.

The detailed information regarding sick newborn is not being mentioned here since it will be taken care of by IMNCI and Newborn Care training packages.
Maternal mortality occurs due to various pregnancy-related complications, childbirth or later during the puerperium due to haemorrhage, hypertensive disorders of pregnancy, abortion, obstructed labour or puerperal sepsis. It is now well-recognized that antenatal care alone, no matter how good the quality and the coverage, cannot alleviate the major burden of suffering during and around childbirth. For reducing maternal mortality and morbidity, skilled attendance at every birth and provision of emergency obstetric care are essential. Countries that have been successful in bringing down the maternal mortality ratio are those that have ensured that emergency obstetric care is accessible to all women.

The Government of India envisages that under the Reproductive and Child Health (RCH)-II Programme, 50% of the primary health centres (PHCs) will start functioning round-the-clock and will provide basic emergency obstetric care services, including facilities for parenteral administration of antibiotics, oxytocics and anticonvulsant drugs, manual removal of the placenta, removal of the retained products of conception and assisted vaginal delivery. Facilities for ensuring referral form an integral component of this package of services.

Each chapter in this module deals with a different complication. The sequence of the chapters is such that it takes you through the major potentially life-threatening complications first, followed by complications that are either comparatively uncommon, or where the chances of mortality or long-term morbidity arising as a result of the complication are low.

The guidelines in these chapters will help medical officers to manage common obstetric complications at peripheral facilities. It is essential for you to know your limitations, especially with reference to your knowledge and skills, and also with reference to the infrastructure and equipment available at PHCs. These guidelines specifically point to those situations when referrals are required. However, ensure that the woman's condition is stable before you transport her. Also make sure that she is given a proper referral slip.
(a) ABORTIONS: HAEMORRHAGE DURING EARLY PREGNANCY

Vaginal bleeding during early pregnancy (up to 20 weeks of gestation) can be due to various types of abortions, ectopic pregnancy or the presence of a hydatidiform mole (molar pregnancy).

Definitions

Spontaneous abortion is defined as the spontaneous loss of a pregnancy at a period of gestation before the stage of foetal viability (20 weeks' gestation). The stages of spontaneous abortion include:

* Threatened abortion (the pregnancy may continue);
* Inevitable abortion (the pregnancy will not continue and will proceed to incomplete/complete abortion);
* Incomplete abortion (the products of conception are partially expelled);
* Complete abortion (the products of conception are completely expelled).

Induced abortion is defined as a process by which the pregnancy is deliberately terminated before foetal viability.

Unsafe abortion is defined as an induced abortion performed either by persons lacking the necessary skills, or in uncertified facilities, or both.

Septic abortion is defined as abortion complicated by infection. Sepsis may result from infection if the organisms ascend from the lower genital tract following either a spontaneous or an unsafe abortion. Sepsis is more likely to occur if there are retained products of conception and evacuation has been delayed. Sepsis is a frequent complication of unsafe abortion involving instrumentation.

Differential diagnosis

Table 4 lists the symptoms and signs for differential diagnosis of vaginal bleeding during early pregnancy.

<table>
<thead>
<tr>
<th>Symptoms and signs typically present</th>
<th>Symptoms and signs sometimes present</th>
<th>Probable diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light bleeding¹</td>
<td>Cramping/lower abdominal pain</td>
<td>Threatened abortion</td>
</tr>
<tr>
<td>Closed cervix</td>
<td>Uterus softer than normal</td>
<td></td>
</tr>
<tr>
<td>The size of the uterus corresponds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>to the gestational period</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Heavy bleeding²                     | Cramping/lower abdominal pain       | Inevitable abortion|
| Dilated cervix                      | No expulsion of the products of     |                    |
| The size of the uterus corresponds  | conception                          |                    |
| to the gestational period           | The uterus is tender                |                    |

| Heavy bleeding³                     | Cramping/lower abdominal pain       | Incomplete abortion|
| Dilated cervix                      | History of partial expulsion of     |                    |
| The size of the uterus is smaller   | the products of conception          |                    |
| than that expected for the gestational period | | |
Module-2, Chapter-1

<table>
<thead>
<tr>
<th>Symptoms and signs typically present</th>
<th>Symptoms and signs sometimes present</th>
<th>Probable diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Light bleeding&lt;sup&gt;a&lt;/sup&gt;</td>
<td>• Light cramping/abdominal pain</td>
<td>Complete abortion</td>
</tr>
<tr>
<td>• Closed cervix</td>
<td>• History of expulsion of the products of conception</td>
<td></td>
</tr>
<tr>
<td>• The size of the uterus is smaller than that expected for the gestational period</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Uterus softer than normal</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Symptoms and signs typically present</th>
<th>Symptoms and signs sometimes present</th>
<th>Probable diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Light bleeding&lt;sup&gt;a&lt;/sup&gt;</td>
<td>• Amenorrhoea/irregular bleeding</td>
<td>Ectopic pregnancy</td>
</tr>
<tr>
<td>• Abdominal pain, may be severe</td>
<td>• Fainting</td>
<td></td>
</tr>
<tr>
<td>• Closed cervix</td>
<td>• Presence of tender adnexal mass</td>
<td></td>
</tr>
<tr>
<td>• The size of the uterus is slightly larger than normal</td>
<td>• Tenderness on moving the cervix</td>
<td></td>
</tr>
<tr>
<td>• Uterus softer than normal</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Symptoms and signs typically present</th>
<th>Symptoms and signs sometimes present</th>
<th>Probable diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Heavy bleeding&lt;sup&gt;b&lt;/sup&gt;</td>
<td>• Nausea/vomiting</td>
<td>Molar pregnancy</td>
</tr>
<tr>
<td>• Partial expulsion of the products of conception which resemble grapes</td>
<td>• Spontaneous abortion</td>
<td></td>
</tr>
<tr>
<td>• Dilated cervix</td>
<td>• Cramping/lower abdominal pain</td>
<td></td>
</tr>
<tr>
<td>• The size of the uterus is larger than that expected for the gestational period</td>
<td>• Presence of ovarian cysts (easily ruptured)</td>
<td></td>
</tr>
<tr>
<td>• Uterus softer than normal</td>
<td>• Early onset of pre-eclampsia</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup>Light bleeding: Takes five minutes or longer for a clean pad or cloth to be soaked
<sup>b</sup>Heavy bleeding: Takes less than five minutes for a clean pad or cloth to be soaked

Management

Table 5 gives the guidelines for complete assessment of a woman with spontaneous abortion.

**Table 5 : Guidelines for complete clinical assessment of a woman with spontaneous abortion**

<table>
<thead>
<tr>
<th>Complete clinical assessment</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>History (Ask about and record the information)</td>
<td>• Period of amenorrhoea (ask her the date of her LMP)</td>
</tr>
<tr>
<td></td>
<td>• Bleeding (duration and amount)</td>
</tr>
<tr>
<td></td>
<td>• Abdominal cramping (duration and severity)</td>
</tr>
<tr>
<td></td>
<td>• Foul-smelling vaginal discharge</td>
</tr>
<tr>
<td></td>
<td>• Abdominal or shoulder pain</td>
</tr>
<tr>
<td></td>
<td>• Allergy to drugs</td>
</tr>
<tr>
<td></td>
<td>• H/o passage of the products of conception/foetus/blood clot</td>
</tr>
<tr>
<td></td>
<td>• H/o inserting something into the vagina (suggestive of an illegal abortion)</td>
</tr>
<tr>
<td>Routine physical examination</td>
<td>• Check the vital signs (temperature, pulse, respiratory rate, blood pressure)</td>
</tr>
<tr>
<td></td>
<td>• Examine the general condition of the woman (malnourished)</td>
</tr>
<tr>
<td></td>
<td>• Look for pallor</td>
</tr>
<tr>
<td></td>
<td>• Examine the respiratory system, cardiac system and extremities</td>
</tr>
<tr>
<td>Abdominal examination</td>
<td>• Auscultate for bowel sounds (absent in peritonitis due to septic abortion)</td>
</tr>
<tr>
<td></td>
<td>• Check whether the abdomen is distended (hydatidiform mole, ectopic pregnancy)</td>
</tr>
<tr>
<td></td>
<td>• Assess the presence, location and severity of pain</td>
</tr>
<tr>
<td></td>
<td>• Palpate for abdominal rigidity (tense and hard) and guarding (peritonitis, ectopic pregnancy)</td>
</tr>
<tr>
<td></td>
<td>• Palpate for rebound tenderness&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>• Assess the abdominal mass (molar/ectopic pregnancy)</td>
</tr>
</tbody>
</table>
Pelvic examination

- External pelvic and vaginal examination:
  * Look for lacerations outside the vagina, or over the external genitalia
  * Assess the amount of bleeding (light/heavy)
  * Look for protruding products of conception lying outside the vaginal canal
- P/S examination
  Look for:
  * Any visible product of conception protruding from the cervical os or visible in the vaginal canal
  * Foul-smelling vaginal/cervical discharge
  * Cervical lacerations (indicative of instrumentation; may be suggestive of illegal abortion)
  * Foreign bodies in the vagina
- P/V examination
  * Assess the amount of bleeding (light/heavy)
  * Check whether the cervical os is open or closed (to determine the stage of abortion)
- Bimanual examination
  * Estimate the size of the uterus
  * Palpate for any pelvic masses
  * Examine for pelvic pain (note severity, location, and what causes the pain: is it present at rest; does it occur/increase with touch and pressure; does it occur/increase on moving of the cervix).

Investigations

The woman’s blood group, especially her Rh status, should be a part of routine investigations during the clinical assessment in cases of abortion.

*a To check for rebound tenderness, keep a hand over the abdomen and press gently. Then suddenly remove your hand to release the pressure rapidly. If removal of the hand causes pain or worsens it, there is rebound tenderness. Rebound tenderness is a sign of peritoneal inflammation.

*b In this document, the uterine size is measured by weeks passed after the last menstrual period (LMP) (the uterine size is equivalent to a pregnant uterus of a given number of weeks since LMP) rather than by gestational weeks.

Management of threatened abortion

- Medical treatment is usually not required.
- Advise the woman to avoid strenuous activity and sexual intercourse; complete bed rest is, however, not necessary.
- If the bleeding stops, follow up in an antenatal clinic. Reassess if the bleeding recurs.
- If the bleeding persists, assess for foetal viability (pregnancy test/ultrasound) or ectopic pregnancy. Persistent bleeding, particularly in the presence of a uterus larger than expected, may indicate twins or molar pregnancy. Such cases should be referred to an FRU.

NOTE: Do not give medications such as hormones (e.g. oestrogens or progestins) or tocolytic agents (e.g. Salbutamol or Indomethacin) as they will not prevent miscarriage.

Management of inevitable abortion

- If the pregnancy is less than 12 weeks:
  * Plan for evacuation of the contents of the uterus [see Annexure 18: “Procedure for manual vacuum aspiration for incomplete abortion”].
* Give Misoprostol 400 mcg (2 tablets of 200 mcg each) orally. Repeat once after 4 hours, if necessary.
* Arrange for evacuation as soon as possible.

- If the pregnancy is more than 12 weeks:
  * Await spontaneous expulsion of the products of conception and then evacuate the uterus to remove any retained products of conception.
  * If necessary, augment uterine contractions and expulsion of the products of conception by infusing Oxytocin 20 U in 500 ml of R/L @ 40 drops/minute; OR
  * Administer Tab. Misoprostol, 800 mcg (4 tablets of 200 mcg each), intravaginally. Give 2 tablets (400 mcg) again after 4 hours if the woman has not aborted till then.

**Management of incomplete abortion**

- If the bleeding is light to moderate and the pregnancy is less than 12 weeks, use your fingers or a pair of ring (or sponge) forceps to remove the products of conception protruding through the dilated cervix.
- If the bleeding is heavy and the pregnancy is less than 12 weeks, evacuate the uterus.
  * Manual vacuum aspiration (MVA) is the preferred method of evacuation [see Annexure 18: "Procedure for manual vacuum aspiration for incomplete abortion"]. Do not carry out evacuation by sharp curettage.
  * If evacuation is not immediately possible, give Tab. Misoprostol 400 mcg orally (repeated once after 4 hours, if necessary)
- If the pregnancy is more than 12 weeks:
  * Start an Oxytocin drip, i.e. 20 U of Oxytocin in 500 ml of R/L @ 40 drops/minute until the products of conception are expelled.
  * If necessary, give Tab. Misoprostol 200 mcg vaginally every 4 hours until the products of conception are expelled; do not administer more than a total of 800 mcg.
  * Evacuate any remaining products of conception from the uterus.
- After 12 weeks of pregnancy the foetus is usually expelled in toto but the placenta may be retained, which has to be expelled.
  * If the placenta does not deliver normally, and there is no bleeding, start an Oxytocin drip (as in the case of a delayed third stage of labour with retained placenta). You can keep the patient at the PHC for about 2 hours after starting the Oxytocin drip, waiting for the placenta to be expelled. However, if bleeding occurs, refer immediately to an FRU.
  * If the placenta is still retained, and the woman is bleeding, she needs immediate referral to the FRU. Establish an IV line, start the Oxytocin drip, and refer.
  * In rare cases, even after expulsion of the placenta, the woman may bleed. Such patients too need to be referred to an FRU.
- Ensure post-abortion follow up of the woman after treatment [see below].

**Management of complete abortion**

- Evacuation of the uterus is usually not necessary as all the products of conception have been expelled.
- Observe for heavy bleeding. In case the bleeding continues, refer to an FRU.
- Ensure post-abortion follow up of the woman after treatment [see below].
Table 6 gives a summary of the management of bleeding in early pregnancy.

**Table 6 : Management of bleeding in early pregnancy**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Management</th>
</tr>
</thead>
</table>
| Threatened abortion  | • Advise bed rest  
                      | • No medication required                                                                                                                  |
| Inevitable abortion  | • Evacuate the uterus using MVA  
                      | • Control the bleeding or augment the process of evacuation by giving a drip of Oxytocin (20 U in 500 ml of R/L @ 40 drops/minute) or Misoprostol tablets (4 tablets of 200 mcg each) |
| Incomplete abortion  | • Carry out digital evacuation of the protruding products of conception  
                      | • Evacuate the uterus using MVA  
                      | • Deliver the placenta by augmenting uterine contractions with Inj. Oxytocin  
                      | • If the bleeding is heavy, refer the woman to an FRU |
| Complete abortion     | • Check for any retained products of conception and/or bleeding  
                      | • No further management is required if the condition of the woman is stable                                                               |
| Septic abortion       | • Give Aspirin (2 tablets) or Paracetamol (1 tablet of 500 mg) to control fever (temperature >38 °C)  
                      | • Examine for the presence of any foreign body in the vagina  
                      | • Thoroughly irrigate the vagina to remove any herbs, local medications or caustic substances  
                      | • Give the following antibiotics:  
                      |  * Inj. Ampicillin 2 g IV, every 6 hours PLUS  
                      |  * Inj. Gentamicin 5 mg/kg body weight, IV, every 24 hours PLUS  
                      |  * Inj. Metronidazole 500 mg IV, every 8 hours, until the woman has no fever for 48 hours  
                      | (To avoid phlebitis, change the infusion site every three days or at the first sign of inflammation).  
                      | • If the bleeding is minimal, conduct evacuate the uterus after 48 hours of antibiotic coverage; preferably use MVA.  
                      | • If the bleeding is more than 200 ml refer the woman to an FRU.    |

**General treatment of vaginal bleeding in early pregnancy**

**Universal measures**

Monitor the woman's vital signs and general condition. When complications exist, it is important to take steps to continue stabilizing the woman's condition, before giving specific management for abortion. If the condition of the patient suddenly worsens, reassess for shock or other complications and treat as appropriate.
Module-2, Chapter-1

Oxygen

If the woman is stable and there are no life-threatening complications (i.e. she is not in shock and the vital signs are normal), oxygen is NOT required. If she is being given oxygen because of a complication, continue oxygen as directed in the relevant chapter(s) related to the complication(s).

Fluids

If the woman is stable and there are no complications (i.e. she is not in shock and the vital signs are normal), IV fluids are NOT required. If she requires IV fluids because of a complication, continue treatment according to the relevant chapter(s) related to the complication(s).

Medicines

Oral medicines may be given if the woman is stable and there are no life-threatening complications. The IV or IM routes of administration are the ONLY acceptable routes for giving medicines if the woman is in shock. If she is also being treated for a life-threatening condition, follow the treatment guidelines for that condition.

Antibiotics: Antibiotics should preferably be given intravenously. If an evacuation is needed, start antibiotics before carrying out the evacuation. In case of a septic abortion, give the woman an antibiotic cover for at least 48 hours before carrying out uterine evacuation.

Tetanus toxoid: If there is a possibility that the woman was exposed to tetanus (if the abortion was not performed with sterile instruments, and/or if there was any contamination of the instruments or wound with dirt, as may be the case in an unsafe abortion, there is a chance of exposure to tetanus), and her vaccination history is uncertain, give her Inj. TT (0.5 mg IM) and tetanus antitoxin.

Pain control: For the control of pain, give Pethidine 1 mg/kg body weight (but no more than 100 mg) IM or IV slowly every 4 hours as needed. This may be given with or without Diazepam. Diazepam may be given in increments of 1 mg IV. Wait for at least two minutes before giving another increment. A safe and sufficient level of sedation is achieved when the woman’s upper eyelid droops and just covers the pupil. Monitor the RR. If the RR falls below 10 breaths/minute, stop administration of all sedative or analgesic drugs.

**Do not mix Diazepam with Pethidine in the same syringe, as the mixture forms a precipitate. Use separate syringes.**

Additional measures

The woman’s Rh status should be routinely assessed in pregnancy, and especially so in cases of abortion. If the patient is Rh -ve, give a dose of anti-D globulin (1500 IU IM) within 48 hours of uterine evacuation.

Complications of abortion

Patients who bleed in early pregnancy may also present with complications of abortion. In these cases there will invariably be a history of induced abortion at the hands of unqualified personnel. Table 7 gives the diagnosis and management of complications of abortion.
### Table 7: Diagnosis and management of complications of abortion

<table>
<thead>
<tr>
<th>Complications</th>
<th>Symptoms and signs</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Injuries</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uterine, vaginal, urinary bladder or bowel (if left unattended, these injuries can get infected and lead to sepsis)</td>
<td>• Abdominal pain/cramping • Shoulder pain • Nausea/vomiting • Vaginal bleeding • Retention of urine or dysuria or incontinence</td>
<td>• Start an IV line; infuse R/L as a maintenance drip. • Refer to an FRU. Ensure that facilities for conducting an operation are available at the FRU.</td>
</tr>
<tr>
<td></td>
<td>Symptoms</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Fever (if associated with infection/sepsis) • Distended abdomen • Rigid (tense and hard) abdomen • Rebound tenderness • Vaginal haematoma</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Signs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Fever (if associated with infection/sepsis) • Distended abdomen • Rigid (tense and hard) abdomen • Rebound tenderness • Vaginal haematoma</td>
<td></td>
</tr>
<tr>
<td><strong>Infection/sepsis</strong> (might result from aseptic techniques and interventions, or might occur as a further complication of the injuries mentioned above)</td>
<td>Symptoms</td>
<td>• Pain in the lower abdomen • Malaise • Prolonged bleeding • Foul-smelling vaginal discharge • Fever</td>
</tr>
<tr>
<td></td>
<td>Signs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Pain in the lower abdomen • Malaise • Prolonged bleeding • Foul-smelling vaginal discharge • Fever</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Give Ampicillin 2 g IV every 6 hours PLUS Gentamicin 5 mg/kg body weight IV every 24 hours PLUS Metronidazole 500 mg IV every 8 hours until the woman is fever free for 48 hours.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Start an IV line; infuse R/L. • Give an antipyretic such as Aspirin or Paracetamol to control the fever. • Begin antibiotics as soon as possible before attempting uterine evacuation by MVA (in case of incomplete abortion and heavy bleeding).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>If you cannot perform MVA, or the bleeding continues, or the condition deteriorates, refer the woman immediately to an FRU.</td>
<td></td>
</tr>
</tbody>
</table>

**Follow-up of women who have had an abortion**

Before discharge, tell a woman who has had a spontaneous abortion that:

- Spontaneous abortion is common and occurs in at least 15% (1 in 7) of clinically recognized pregnancies.
- The chances of a subsequent successful pregnancy are good unless there has been sepsis or the cause of abortion is identified, which may have an adverse effect on future pregnancies (this is rare).
- It is better to delay the next pregnancy till the woman has completely recovered, even though she may want to become pregnant soon after having an abortion.
Contraceptive counselling

Depending on the reproductive decision of the couple, contraceptive counselling should be offered. This is especially important for women who have had an unsafe abortion. If pregnancy is not desired, certain methods of family planning can be started immediately (within 7 days), provided:

- there are no severe complications requiring further treatment and
- the woman receives adequate counselling to help her select the most appropriate family planning method (see Table 8).

Table 8: Family planning methods advisable after an abortion

<table>
<thead>
<tr>
<th>Type of contraceptive</th>
<th>Advise to start</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hormonal (pills, injections, implants)</td>
<td>• Immediately</td>
</tr>
<tr>
<td>Condoms</td>
<td>• Immediately</td>
</tr>
<tr>
<td>Intrauterine device</td>
<td>• Immediately</td>
</tr>
<tr>
<td></td>
<td>• If infection is present or suspected, delay insertion till it is cleared</td>
</tr>
<tr>
<td></td>
<td>• If the level of haemoglobin (Hb) is less than 7 g/dl, delay until the anaemia improves</td>
</tr>
<tr>
<td></td>
<td>• Provide an interim method (e.g. condom)</td>
</tr>
<tr>
<td>Voluntary tubal ligation</td>
<td>• Immediately</td>
</tr>
<tr>
<td></td>
<td>• If infection is present or suspected, delay surgery until it is cleared</td>
</tr>
<tr>
<td></td>
<td>• If the Hb level is less than 7 g/dl, delay until anaemia improves</td>
</tr>
<tr>
<td></td>
<td>• Provide an interim method (e.g. condom)</td>
</tr>
</tbody>
</table>
(b) ANTEPARTUM HAEMORRHAGE: HAEMORRHAGE DURING LATE PREGNANCY AND LABOUR

Definitions

Vaginal bleeding occurring after 20 weeks of pregnancy or during labour (but before delivery of the baby) is known as antepartum haemorrhage (APH).

APH can be due to 3 causes:

* **Placenta praevia:** This is defined as implantation of the placenta at or near the cervix.
* **Abruptio placentae (accidental haemorrhage):** This is due to detachment of a normally located placenta from the uterus before the foetus is delivered.
* **Ruptured uterus:** Bleeding from a ruptured uterus may occur vaginally unless the foetal head blocks the pelvis. Bleeding may also occur intra-abdominally. Rupture of the lower uterine segment into the broad ligament, however, will not release blood into the abdominal cavity. Rather, it may form a haematoma in the broad ligament.

A woman with APH, if not managed in time, can bleed to death within 12 hours of the start of bleeding. It is an important cause of maternal mortality.

Clinical features and diagnosis

- Table 9 gives the clinical features and differential diagnosis of APH.

Table 9: Diagnosis of antepartum haemorrhage

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Placenta praevia</th>
<th>Abruptio placentae</th>
<th>Uterine rupture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nature of the bleeding</td>
<td>Painless, causeless and recurrent</td>
<td>Painful; pain is often localized to start with and later becomes generalized, attributed to pre-eclampsia or trauma and is continuous.</td>
<td>The bleeding often occurs after the woman has been in labour for a long time.</td>
</tr>
<tr>
<td></td>
<td>The bleeding is always revealed</td>
<td>The bleeding is revealed, concealed, or usually mixed</td>
<td>The bleeding may be concealed or mixed</td>
</tr>
<tr>
<td>General condition and anaemia</td>
<td>Proportional to the amount of blood loss</td>
<td>Out of proportion to the visible blood loss in the concealed variety</td>
<td>Out of proportion to the visible blood loss</td>
</tr>
<tr>
<td>Features of pre-eclampsia</td>
<td>Not relevant</td>
<td>Present in one-third of cases</td>
<td>Not relevant</td>
</tr>
<tr>
<td>Height of the uterus</td>
<td>Proportional to the gestational age</td>
<td>May be disproportionately enlarged in the concealed type</td>
<td>Uterine contour not felt; occasionally, the uterus is felt separately on one side</td>
</tr>
<tr>
<td>Feel of the uterus</td>
<td>Soft and relaxed</td>
<td>May be tense, tender and rigid</td>
<td>Foetal parts felt superficially; malpresentation may be present</td>
</tr>
<tr>
<td>Malpresentation</td>
<td>Common; the head is high and floating</td>
<td>Unrelated; head may be engaged</td>
<td>The placenta may be attached to the uterus or may be lying free in the peritoneal cavity</td>
</tr>
<tr>
<td>Localization of placenta</td>
<td>Placenta is in the lower segment of the uterus</td>
<td>Placenta is in the upper segment</td>
<td></td>
</tr>
<tr>
<td>Vaginal examination</td>
<td>Placenta felt in the lower segment</td>
<td>The placenta is not felt in the lower segment</td>
<td>The presenting part is high up or not felt; the contracted uterus may be felt on one side</td>
</tr>
</tbody>
</table>
A careful P/S examination may be performed to rule out other causes of bleeding such as cervicitis, trauma, cervical polyps or cervical malignancy. The presence of these, however, does not rule out placenta praevia.

General management

- Make a rapid evaluation of the general condition of the woman including vital signs (pulse, BP, RR, temperature).

Do NOT carry out a vaginal examination at this stage.

- If shock is suspected, immediately begin treatment. While evaluating the woman, keep the possibility of shock in mind even if signs of shock are not present because her status may worsen rapidly. If shock develops, it is important to begin treatment immediately [see Module 2, Chapter 9: "Management of shock"].

- Start IV infusion [see Annexure 14: "Inserting an IV line and giving IV fluids"].

- Give oxygen by nasal catheter.

- Assess the clotting status using a bedside clotting test. Failure of a clot to form after 7 minutes or formation of a soft clot that breaks down easily suggests the presence of a coagulopathy (in abruptio placentae).

- Do not sedate a woman with APH, even if she is in pain, as sedation may mask the signs of hypoxia should it occur as a consequence of haemorrhage and shock.

- Refer such patients to a specialist at an FRU.

- If the woman has a ruptured uterus, start IV antibiotics and insert a self-retaining Foley catheter before referring the woman to an FRU.

Management/referral

A woman with placenta praevia, abruptio placentae or ruptured uterus should not be managed at the PHC because there are no facilities for blood transfusion or surgical intervention, if required. Refer such a woman immediately to an FRU equipped with facilities for surgical obstetrics, blood transfusion and anaesthesia after providing general management as discussed above.
Chart 2: Management of antepartum haemorrhage

ASSESS

Do not conduct a vaginal examination.

- The bleeding is painless
- The uterus is relaxed
- The foetal heart sound (FHS) is heard

- Bleeding per vaginum (P/V) with abdominal pain which is initially localized and then generalized
- The uterus is tense and tender
- Foetal parts are not easily felt
- FHS is usually not heard but may be present

- Shock
- Tender abdomen
- Uterine contour not felt
- Superficial foetal parts
- FHS not heard
- Small, contracted uterus may be felt on one side of the lower abdomen

Placenta praevia
- Arrange for blood donors
- Start IV fluids
- Check for shock
- Refer to an FRU

Abruptio placentae
- Arrange for blood donors
- Start IV fluids
- Check for shock
- Refer to an FRU

Ruptured uterus
- Arrange for blood donors
- Start IV fluids
- Start antibiotics
- Check for shock
- Refer to an FRU
(c) POSTPARTUM HAEMORRHAGE : HAEMORRHAGE AFTER CHILDBIRTH

Excessive bleeding after childbirth or postpartum haemorrhage (PPH) is defined as bleeding in excess of 500 ml following delivery. This is a life-threatening condition and is a major cause of maternal mortality.

Definitions

Postpartum haemorrhage

PPH is defined as the loss of 500 ml or more of blood from the genital tract after a vaginal delivery up to the end of the puerperium. As it is difficult to measure the exact amount of blood loss, an operational definition of PPH, important from the point of view of making a diagnosis, is the soaking of more than one pad per hour or bright red bleeding with or without clots after delivery. As the same amount of blood loss may have a variable effect in different women (the effect is more in those with PIH, dehydration, short stature, anaemia), the qualitative definition is more important. This includes any amount of blood loss after delivery up to 6 weeks, but which affects the woman's haemodynamic stability.

It is important to remember that a lower level of blood loss can cause the woman's condition to deteriorate in certain circumstances. This will include the presence of anaemia, PIH, pre-eclampsia or other medical conditions, e.g. cardiac disease. Often, it is difficult to assess the amount of blood a woman has lost. The blood may be mixed with the amniotic fluid or urine or may simply be dispersed on the linen or on the floor. A woman with normal Hb will tolerate blood loss better; the same amount would be fatal for an anaemic woman.

Immediate postpartum haemorrhage

This includes all occurrences of increased bleeding within 24 hours after delivery. Excessive bleeding during the third stage of labour, which is also known as "third-stage haemorrhage" is included in immediate PPH. Immediate PPH is more common than delayed PPH [see below in this chapter], it generally involves heavier bleeding and is associated with greater morbidity. Immediate PPH most often occurs within 4 hours after delivery.

Immediate PPH is most commonly caused by uterine atony, i.e. failure of the uterus to contract properly after childbirth. Other causes include trauma to the genital tract or presence of retained placenta and placental fragments. The placenta is said to be retained when it has not been delivered within half an hour after delivery.

Delayed postpartum haemorrhage

All cases of PPH occurring between 24 hours after delivery and 6 weeks postpartum are included.

The main causes of PPH are atonic uterus or trauma to the genital tract.

Atonic bleeding: This 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.

Active management of the third stage of labour for preventing PPH

Active management of the third stage of labour helps in preventing PPH. It is recommended that the practice of active management including prophylactic administration of oxytocsics, CCT and uterine massage should be
routinely followed, as far as possible (see Module 1, Chapter 2: "Care during labour and delivery-intrapartum care"). By carrying out active management of the third stage of labour it has been found that the length of the third stage and the incidence of PPH are significantly reduced.

**PPH: Identifying the problem**

It is crucial to understand the importance of identifying and defining the problem of PPH in order to provide effective management.

**Table 10: Diagnosis of vaginal bleeding after childbirth**

<table>
<thead>
<tr>
<th>Signs and symptoms typically present</th>
<th>Symptoms and signs sometimes present</th>
<th>Probable diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immediate PPH a (the uterus is soft and not contracted)</td>
<td>Shock</td>
<td>Atonic uterus</td>
</tr>
<tr>
<td>Immediate PPH (the bleeding is bright red)</td>
<td>Complete placenta</td>
<td>Tears in the cervix or vagina</td>
</tr>
<tr>
<td>Placenta not delivered within 30 minutes after delivery</td>
<td>Immediate PPH</td>
<td>Retained placenta</td>
</tr>
<tr>
<td>A portion of the maternal surface of the placenta is missing or the membranes are torn</td>
<td>Immediate PPH</td>
<td>Retained placental fragments</td>
</tr>
<tr>
<td>• The uterine fundus is not felt on abdominal palpation</td>
<td>Inverted uterus apparent at the vulva</td>
<td>Inverted uterus</td>
</tr>
<tr>
<td>• Slight or intense pain</td>
<td>Immediate PPH b</td>
<td></td>
</tr>
<tr>
<td>• Delayed PPH</td>
<td>Bleeding is variable (light or heavy, continuous or irregular), and foul-smelling</td>
<td>Delayed PPH</td>
</tr>
<tr>
<td>• Uterus softer and larger than expected for the elapsed time</td>
<td>Anaemia</td>
<td></td>
</tr>
<tr>
<td>• Immediate PPH (bleeding is intra-abdominal and/or transvaginal)</td>
<td>Shock (may be out of proportion to visible blood loss)</td>
<td>Ruptured uterus</td>
</tr>
<tr>
<td>• Severe abdominal pain (may decrease after rupture of the uterus)</td>
<td>Rapid maternal pulse</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tender abdomen</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Uterine contour not felt</td>
<td></td>
</tr>
</tbody>
</table>

a Bleeding may be light if a clot blocks the cervix or if the woman is lying on her back.

b There may be no bleeding with complete inversion.

Atonic uterus is the cause of 80% of cases of PPH. Hence, the most important step in making a diagnosis of the cause of PPH is to keep a hand on the lower abdomen of the woman and feel for the uterine tone. If the uterus is soft and not contracted, it indicates atonic PPH (with or without associated genital tract trauma). Manage as given below. If the uterus is contracted but the bleeding continues, it is a case of traumatic PPH, which could be because of vaginal/cervical/perineal tears or lacerations, ruptured uterus, inversion of the uterus, etc. Manage accordingly, as appropriate at the PHC level.
Managing specific problems

Atonic PPH with Placenta delivered

Atonic PPH refers to bleeding from the placental site due to lack of tone in the uterus. In this case, the uterus is not well contracted. To stop the bleeding it is essential to make the uterus contract and empty it. It is soft, distended and lacking in tone. The management of atonic bleeding when the placenta has been delivered is given below.

• Rub up a contraction and expel any clots [see Annexure 10: "Procedure for uterine massage and expulsion of clots"]. You may need the help of an assistant to compress the uterus.

• Give an oxytocic. Give a bolus dose of Inj. Oxytocin 10 U IM.

• Start an IV line [see Annexure 14: "Inserting an IV line and giving IV fluids"] with an 18- or 16-gauge needle.

• Withdraw blood for grouping.

• Start IV fluids (3 U of R/L for every unit of blood lost). Infuse Oxytocin 10 IU in 500 ml (1 bottle) of IV fluids @ 60 drops/minute.

• In case IV access is not possible, give Inj. Oxytocin IM.

• Catheterize the patient to facilitate uterine contraction and to assess the urine output in case of shock.

• Assess the patient’s condition (pulse, BP, colour, consciousness, uterine tone, urinary output) and estimate how much blood has already been lost. If the woman is in shock, make sure that the airway is open, turn her head to one side, and give her oxygen, if available, @ 6-8 L/minute through a mask or nasal cannula. Raise the foot end of bed (by one foot) in case of shock.

• Monitor the vital signs—BP, pulse, RR and urinary output. Check that the expelled placenta and membranes are complete.

• Anticipate the need for blood. Refer in case blood transfusion is necessary. An R/L drip is recommended (if R/L is not available, give normal saline) and if the woman is in shock, it should be given fast (1 L in 15 minutes) until the condition of the woman stabilizes. A rising BP (systolic 90 mmHg) and heart rate/pulse under 90 beats/minute are signs of stabilization.

• Empty the urinary bladder and keep it empty. Insert a catheter if the woman is unable to use a bedpan.

• Keep the uterus well contracted. Add 10 U of Oxytocin to 500 ml of IV fluids and run it @ 40 drops/minute as a continuing dose (you may need to set up a second IV drip). No more than 100 U of Oxytocin should be given in 24 hours. Oxytocin should never be given as an IV bolus. Try putting the baby to the breast or use nipple stimulation if the baby does not suckle. If the bleeding persists and the uterus continues to be in the relaxed state, use bimanual compression.

• In emergency situations, if bleeding continues perform bimanual compression of the uterus [see Annexure 19: "Procedure for bimanual compression of the uterus"]

• After the procedure, broad-spectrum antibiotics may be started as a prophylaxis against infection.

Atonic PPH with retained placenta

• Follow the same procedure as above, with uterine massage, expulsion of clots, Inj. Oxytocin IM, starting an IV line with Oxytocin infusion, etc. Do NOT give Ergometrine as it causes tonic uterine contraction, which may delay expulsion.
• Assess the patient's condition (pulse, BP, colour, consciousness, uterine tone) and estimate how much blood has already been lost. If the woman is in shock, make sure that the airway is open, turn her head to one side and give her oxygen, if available, @ 6-8 L/minute through a mask or nasal cannula.

• Empty the bladder and attempt CCT [see Annexure 9]. If it is successful, examine the placenta to ensure that it is complete.

• Keep the uterus contracted by massaging the fundus. Put 20 IU of Oxytocin in 500 ml of R/L (1 bottle) and run it rapidly @ 40 drops/minute. (You may need to set up a second IV drip.) Put the baby to the breast or use nipple stimulation if the baby does not suckle.

• If CCT is not successful, a gentle vaginal examination should be performed. If the placenta can be felt protruding through the cervix, it should be grasped with the fingers and steadily withdrawn. The other hand fixes the uterus over the suprapubic space, pushing the uterine fundus upwards to prevent inversion of the uterus.

• If the placenta cannot be delivered, and the cervix is dilated, manual removal of the placenta (MRP) should be attempted [see Annexure 20: "Procedure for manual removal of the placenta"] after giving the patient plasma expanders if needed and keeping an Oxytocin drip running.

• After MRP has been carried out, continue IV infusion of Oxytocin as above and massage the uterus. The woman should be started on broad-spectrum antibiotics.

• If the placenta is retained BUT the woman is not bleeding, start the woman on IV fluids (without Oxytocin) and refer her to an FRU for further management.

NOTE: Very adherent tissue may indicate placenta accreta. Efforts to extract a placenta that does not separate easily may result in heavy bleeding or uterine perforation, which usually requires hysterectomy. Hence, it is advisable to refer such cases to an FRU immediately.

Post-procedure care in atonic PPH with/without retained placenta

• Monitor the vital signs (pulse, BP, RR) every 10 minutes for the first 30 minutes, every 15 minutes for the next 30 minutes and then every 30 minutes for the next 3-6 hours or until stable.

• Palpate the uterine fundus to ensure that the uterus remains contracted.

• Check for excessive bleeding every 30 minutes.

• Continue infusion of IV fluids.

• If the bleeding continues, assess the clotting status using a bedside clotting test. Failure of a clot to form after 7 minutes or formation of a soft clot that breaks down easily suggests coagulopathy. In such cases, refer the woman immediately to an FRU.

• If there are signs of infection (fever, foul-smelling vaginal discharge), give antibiotics.

• Monitor the urinary output (should be more than 400 ml in 24 hours).
Chart 3: Management of atonic postpartum haemorrhage

Referral and transfer

You should arrange referral to a higher facility if:

- The bleeding is not controlled;
- There are retained bits of placenta which cannot be removed manually;
- The placenta is retained due to a constriction ring or if hours or days have passed since delivery, as in these cases it may not be possible to get the entire hand into the uterus. Since facilities for giving anaesthesia are not available at the PHC, it is advisable to refer such patients to an FRU.
- Inversion or rupture of the uterus is the cause of PPH.

Table 11: Use of oxytocic drugs for the management of postpartum haemorrhage

<table>
<thead>
<tr>
<th></th>
<th>Oxytocin</th>
<th>Ergometrine/ Methylergometrine</th>
<th>15-methyl Prostaglandin F2a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dose and route</td>
<td>IV: Infuse 10 U in 500 ml R/L @ 60 drops/minute • IM: 10 U</td>
<td>IM or IV (slowly): 0.2 mg</td>
<td>IM: 0.25 mg</td>
</tr>
<tr>
<td>Continuing dose</td>
<td>IV: Infuse 20 U in 500 ml R/L @ 40 drops/minute</td>
<td>• Repeat 0.2 mg IM after 15 minutes • If required, give 0.2 mg IM or IV (slowly) every 4 hours</td>
<td>0.25 mg every 15 minutes</td>
</tr>
<tr>
<td>Maximum dose</td>
<td>Not more than 100 U of Oxytocin in 24 hours</td>
<td>5 doses (total 1.0 mg)</td>
<td>5 doses (total 1.5 mg)</td>
</tr>
<tr>
<td>Precautions/ contraindications</td>
<td>Do not give as an IV bolus</td>
<td>Pre-eclampsia, hypertension, heart disease • Asthma • Never give IV</td>
<td></td>
</tr>
<tr>
<td>Side-effects</td>
<td>Hypotension (if given as IV bolus)</td>
<td>Vomiting</td>
<td>Nausea/vomiting • Diarrhoea</td>
</tr>
</tbody>
</table>
Traumatic PPH

Traumatic PPH is recognized when there is bleeding from the genital tract but the uterus is well contracted and placenta has been delivered completely along with the membranes. Suspect traumatic bleeding in cases of instrumental delivery, precipitate labour and previous scar in the uterus. The bleeding may be coming from any of the following:

- Perineum: tear or episiotomy wound
- Vulva: ruptured varicosities, tears or a haematoma can occur (haematoma may not be obvious immediately after delivery but can cause severe pain and shock)
- Vagina: lacerations of the wall or rupture of varicosities
- Cervix: lacerations/tear
- Uterus: rupture or inversion of the uterus can also occur and is accompanied by marked pain and shock.

General management of a case of traumatic PPH

- Check the pulse and BP and observe the general condition. Estimate the blood loss.
- Set up an IV line; give R/L. You may also give plasma expanders if they are available and if the woman is in shock.
- If the bleeding is from the lower genital tract (vulva, perineum, lower vagina) repair the tear with catgut \[\text{see Annexure 21: "Procedure for repair of vaginal/cervical/perineal tears".}\]
- If a small bleeder is seen, catch it with an artery forceps and tie it with catgut.
- If the tear cannot be managed at the PHC, refer to an FRU after packing the vagina with gauze.
- Start the woman on a broad-spectrum antibiotic such as Inj. Ampicillin 1 g stat IM followed by 500 mg every 6 hours for five days, or Cap. Amoxicillin 1 g stat orally followed by 500 g every 8 hours.

Rupture of the uterus

Injury to the uterus can be caused by rough handling of the uterus during MRP. Women who present with a retained placenta after a home delivery are the most likely to have injury to the uterus from an unsuccessful attempt(s) to remove the placenta. If the woman has previously had a curettage, or a caesarean section, or a uterine operation, there may be weak areas on the uterine wall, making it susceptible to rupture.

A woman with uterine rupture will have PPH along with abdominal pain. The abdomen is tender on palpation and the uterine contour will not be easily felt. The woman may even be in shock.

Rupture of the uterus requires immediate laparotomy with possible hysterectomy or repair of the uterine tear. Hence, such cases should be immediately referred to an FRU.

Vaginal/cervical/perineal tears

These tears need to be sutured to stop the haemorrhage \[\text{see Annexure 21: "Procedure for repair of vaginal/cervical/perineal tears".}\]. If you cannot repair the tear, or if the woman continues to bleed even after suturing, refer her immediately to an FRU where the services of an obstetrician are available. Remember to pack the vagina with sterile gauze before referring the woman.
Care after repairing a vaginal/cervical/perineal tear

- Check the woman’s vital signs (pulse, BP, temperature) every 15 minutes for 1 hour, then every 30 minutes for the next 2 hours, then monitor as per the condition of the woman.
- Watch for bleeding and/or the development of a haematoma.
- Give IV fluids according to the patient's condition.
- Give prophylactic antibiotics, e.g. Cap. Amoxicillin 500 mg orally every 8 hours for 5 days.
- Follow up the patient in 10 days, then in 6 weeks to check that the wound is healing properly.

Complications after repairing a tear and their management

Early complications

1. **Bleeding:** It may occur if the blood vessels have not been ligated properly. Prevent it by carefully ligating the bleeding points while suturing. Make sure that the bleeding is not coming from an atonic uterus.
2. **Haematoma:** This refers to a collection of blood in the vaginal wall, which commonly occurs as a complication of vaginal injury. It may be present with vaginal or vulval swelling or intense pain and retention of urine. Prevent it by carefully ligating the bleeding points while suturing. If the haematoma is large and painful, refer the woman to an FRU, as the haematoma needs to be incised and drained under general anaesthesia.
3. **Retention of urine:** The woman should be encouraged to pass urine frequently. She can sit or squat for the same. If she is unable to pass urine on her own, a self-retaining catheter may have to be inserted to avoid straining. Keep the catheter in place for 48 hours under antibiotic cover.
4. **Infection:** This is a common complication and may be avoided by giving the woman prophylactic antibiotics and using an aseptic technique to repair the tear. However, if infection sets in, remove the sutures which come out or are lying loose. Remember all the sutures need not be removed at the same time. If the wound is gaping, secondary sutures need to be applied but only after the infection has cleared.

Late complications

1. **Scarring and vaginal stenosis** (narrowing) may occur in some cases of neglected tears of the vagina and may cause pain during intercourse and obstructed labour in subsequent deliveries.
2. **Cervical scarring** due to an un repaired cervical tear may lead to prolonged labour in subsequent pregnancies because the cervix cannot dilate properly. If cervical tears are not sutured properly, it may lead to repeated abortions on account of “cervical incompetence”. There is also a tendency for repeat cervical tear in subsequent deliveries at the site of the previous tear.
3. Vesicovaginal, vesicocervical or rectovaginal **fistulae** can occur if vaginal or cervical tears extend into the bladder or rectum.
Hypertensive disorders in pregnancy include

- Pregnancy induced hypertension (hypertension with no proteinuria)
- Pre-eclampsia (hypertension with proteinuria)
- Eclampsia (pre-eclampsia with superadded convulsions)
- Chronic hypertension (hypertension antedating pregnancy and persisting postpartum)
- Chronic hypertension with superadded pre-eclampsia or eclampsia

Definitions

Pre-eclampsia

Pre-eclampsia is a condition specific to pregnancy, arising after the 20th week of gestation, characterized by hypertension and proteinuria. Oedema may also be present.

Hypertension

Hypertension is defined as:
- a BP of 140/90 mmHg or more
- an increase in the systolic pressure by 30 mmHg or more (if the "usual level", i.e. BP taken before 16 weeks of gestation, is known)
- an increase in the diastolic pressure of 15 mmHg or more (if the "usual level" is known). An increase in the diastolic pressure is more significant because, unlike the systolic pressure, it is not affected by posture or excitement. It should be taken on at least two occasions, about 6 hours apart.

Proteinuria

Proteinuria is defined as a protein concentration of 0.3 g/L or more in at least two random urine samples collected 6 or more hours apart. A woman developing pre-eclampsia rarely has proteinuria before there is a rise in her BP. When proteinuria is present with a normal BP, it usually does not indicate pre-eclampsia but could indicate urinary tract infection (UTI), kidney disease or contamination of the sample, and is also found after prolonged standing.

Oedema

Oedema, especially pedal oedema, is commonly seen in normal pregnancy and is, therefore, not a reliable sign of pre-eclampsia except when oedema of the hands and/or face starts suddenly. Sometimes oedema is not obvious on examination but manifests itself only by excessive weight gain (this is called occult oedema or hidden oedema). An excessive weight gain of 1 kg or more in a week (or 3 kg in a month) is indicative of pre-eclampsia (the normal weight gain is about 0.5 kg per week, or 2 kg in a month).

Oedema in a case of pre-eclampsia may occur at the following sites:
* The front of the legs (pre-tibial)/dorsum of the foot and over the ankles
* Hands/fingers
* Face, eyelids
* Abdominal wall
* Sacral area
* Vulva
Classification of pre-eclampsia

Pre-eclampsia may be classified as mild and severe. Table 12 lists the clinical features of both these categories.

Table 12: Classification of pre-eclampsia

<table>
<thead>
<tr>
<th>Finding</th>
<th>Mild pre-eclampsia</th>
<th>Severe pre-eclampsia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood pressure (BP)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• The diastolic pressure rises 15-20 mmHg above the &quot;usual&quot; level; OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• The absolute level of BP is &gt;140/90 mmHg but &lt;160/110 mmHg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proteinuria</td>
<td>Present, but 2+ or less</td>
<td>3+ or persistently greater</td>
</tr>
<tr>
<td>Generalized oedema (including in the face and hands)</td>
<td>May or may not be present</td>
<td>Present</td>
</tr>
<tr>
<td>Headache</td>
<td>Absent</td>
<td>Present</td>
</tr>
<tr>
<td>Visual disturbances</td>
<td>Absent</td>
<td>Present</td>
</tr>
<tr>
<td>Upper abdominal pain</td>
<td>Absent</td>
<td>Present</td>
</tr>
<tr>
<td>Oliguria</td>
<td>Absent</td>
<td>Present</td>
</tr>
<tr>
<td>Diminished foetal movement</td>
<td>Absent</td>
<td>Present</td>
</tr>
</tbody>
</table>

It is not necessary that all these signs are present in all cases.

Eclampsia

Eclampsia is a condition peculiar to pregnant or recently delivered women. It is characterized by convulsions/fits followed by more or less prolonged coma. The woman usually has hypertension and proteinuria. The convulsions may occur in the antepartum, intrapartum or the postpartum period.

Pre-eclampsia and eclampsia are part of the same spectrum of disorders with eclampsia being the severe form of the disease. Pre-eclampsia almost always precedes eclampsia. Not all cases follow an orderly progression from mild to severe disease; some women may develop severe pre-eclampsia or eclampsia suddenly.

Sometimes convulsions seem to occur at apparently normal BP levels (although this is rare); in such cases, one should consider what is normal for each person. In some women, the "usual/normal" BP is low, in the order of 100/60 mmHg, and in these individuals eclampsia could occur at a BP of 120/80 mmHg, which is usually considered normal, but represents hypertension in these women. Thus, it is re-emphasized that it is the rise in BP (above the "usual" values) that counts more than the absolute value.

Fulminating pre-eclampsia

Fulminating pre-eclampsia is severe pre-eclampsia that occurs suddenly. The woman can rapidly develop eclampsia. This is an obstetric emergency and management should start immediately.

Imminent eclampsia

Imminent eclampsia means that an eclamptic fit is likely to occur very soon.

Symptoms of imminent eclampsia:

• Severe headache
• Drowsiness
• Mental confusion
• Visual disturbances (e.g. blurred vision, flashes of light, double vision)
• Epigastric pain
• Nausea, vomiting
• Decreased urinary output

Signs of imminent eclampsia:
• A sharp rise in the BP
• Increased proteinuria
• Exaggerated knee jerk

Status eclampticus
Status eclampticus refers to a state in which convulsions or eclamptic fits continue one after the other. This condition is dangerous for both the mother and the foetus, and can lead to maternal and foetal mortality.

Stages of an eclamptic fit
The stages of an eclamptic fit are similar to those of an epileptic fit.

1. Premonitory stage
This stage lasts for 10-20 seconds during which:
   - the eyes roll or stare;
   - the muscles of the face and hand(s) may twitch;
   - there is loss of consciousness.

2. Tonic stage
This stage lasts for 10-20 seconds during which:
   - the muscles go stiff or rigid;
   - the diaphragm is in spasm, so that breathing stops and cyanosis occurs;
   - the back may be arched;
   - the teeth are clenched;
   - the eyes bulge.

3. Clonic stage
This stage lasts for 1-2 minutes and is marked by:
   - violent contraction and relaxation of the muscles;
   - increased salivation causing “frothing” at the mouth;
   - deep, noisy breathing;
   - inhalation of mucus or saliva;
   - the face looks congested (filled with blood) and swollen;
   - the tongue may be bitten by violent clenching of the teeth and jaws.
4. Coma stage

This stage may last for several minutes or hours. During this time:
- there is a stage of deep unconsciousness;
- the breathing is noisy and rapid;
- cyanosis fades, but the face remains congested and swollen;
- further fits may occur before the woman regains consciousness.

If and when the woman regains consciousness, she does not remember that she had fits.

**Convulsions**

Table 13 provides the differential diagnosis of convulsions during pregnancy. Convulsion:
- can occur regardless of severity of hypertension
- are difficult to predict and typically occur in the absence of hyperreflexia, headache and visual changes
- occur after childbirth in 25% of cases (postpartum eclampsia)
- are tonic-clonic and resemble grand mal epileptic fits
- may occur in a rapid sequence
- may not be observed if the woman is alone
- may be followed by coma that lasts for minutes or hours depending on the frequency of convulsions.

**Table 13 : Differential diagnosis of convulsions during pregnancy**

<table>
<thead>
<tr>
<th>Symptoms and signs typically present</th>
<th>Symptoms and signs sometimes present</th>
<th>Probable diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Convulsions</td>
<td>• BP 140/90 mmHg or more after 20 weeks of gestation; rarely only 110/90 mmHg • Proteinuria 2+ or more</td>
<td>Eclampsia</td>
</tr>
<tr>
<td>• Trismus (difficulty in opening the mouth and chewing) is the first symptom, followed by: • spasms of the face, neck and trunk • arched back • board-like abdomen • spontaneous, violent spasms</td>
<td></td>
<td>Tetanus</td>
</tr>
<tr>
<td>• Convulsions</td>
<td>• Normal BP • Past history of convulsions</td>
<td>Epilepsy</td>
</tr>
<tr>
<td>• Headache</td>
<td>• Jaundice • Anaemia • Enlarged &amp; tender spleen • Convulsions</td>
<td>Complicated malaria (especially Plasmodium falciparum infection)</td>
</tr>
<tr>
<td>• Fever with chills and rigors</td>
<td>• Headache • Neck rigidity • Confusion • Drowsiness</td>
<td>Meningitis or encephalitis</td>
</tr>
<tr>
<td>• Muscle/joint pains</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Irritability</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Give analgesics (e.g. Paracetamol 500 mg orally) as required.
*If the diagnosis of eclampsia cannot be ruled out, continue treatment for eclampsia. If spinal fluid examination cannot be done, refer to a higher health facility.
How eclampsia affects the mother and foetus

In eclampsia, there is a widespread spasm of the arterioles which affects most organs in the body causing organ failure that endangers the lives of both the mother and the foetus. Hence, remember that untreated hypertension in pregnancy can cause maternal and perinatal death.

**Effects on the mother**

These include

* Respiratory (asphyxia, aspiration of vomitus, pulmonary oedema, bronchopneumonia)
* Cardiac (heart failure)
* Brain (haemorrhage, thrombosis, oedema)
* Renal (acute kidney failure)
* Hepatic (liver necrosis)
* HELLP syndrome (haemolysis, elevated liver enzymes, low platelet count)
* Haemorrhage due to coagulation defect, i.e. disseminated intravascular coagulopathy (DIC), which is often associated with eclampsia
* Visual problems (temporary blindness due to oedema of the retina)
* Injuries (fractures, tongue bite)

The most common causes of maternal death in eclampsia are aspiration of vomitus, kidney failure, intracerebral haemorrhage, and multi-organ failure (e.g. heart + liver + kidneys).

**Effects on the foetus**

Placental insufficiency leads to:

* Hypoxia: This may lead to permanent brain damage, which may result in
  - physical handicap
  - cerebral palsy
  - mental retardation
* IUGR
* Stillbirth

**Checklist for eclampsia**

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

* Primigravidas (especially young teenagers and women over the age of 35 years)
* Obese women
* Women with essential hypertension
* Women with multiple pregnancy
* Women with diabetes, hydatidiform mole, polyhydramnios
* Women with a h/o pre-eclampsia or eclampsia in a previous pregnancy
* Women with a family history of eclampsia

The following factors increase the chances of a woman with hypertensive disorder of pregnancy dying due to eclampsia.
**Module-2, Chapter-2**

* Failure to monitor the BP and urine for proteins during prenatal care
* Failure to counsel the woman and her family about the dangerous symptoms of pre-eclampsia and the importance of prenatal care
* Delay in referral of a woman with eclampsia
* Lack of a clear-cut management strategy for dealing with pre-eclampsia and eclampsia
* Lack of proper equipment and drugs to treat eclampsia
* Failure to carry out timely management of complications arising due to eclampsia.

**Diagnosis of hypertension during pregnancy**

The possible presentations of hypertension during pregnancy are:
* A pregnant woman, or a woman who has delivered recently, complains of severe headache and/or blurred vision.
* A pregnant woman, or a woman who has delivered recently, is found unconscious or is having convulsions.
* A pregnant woman has an elevated BP.

The hypertensive disorders of pregnancy include chronic hypertension (elevation of the BP before 20 weeks of gestation) and PIH. Headache, blurred vision, convulsions and loss of consciousness are often associated with hypertension in pregnancy but are not necessarily specifically due to it. Other conditions that may cause convulsions or coma include epilepsy, complicated malaria, head injury, meningitis, encephalitis, etc. (see Table 13 "Differential diagnosis of convulsions during pregnancy"). Table 14 gives the differential diagnosis of hypertensive disorders of pregnancy.

**Table 14 : Differential diagnosis of hypertensive disorders of pregnancy**

<table>
<thead>
<tr>
<th>Symptoms and signs</th>
<th>Probable diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>• BP 140/90 mmHg or more before the first 20 weeks of gestation</td>
<td>Chronic hypertension</td>
</tr>
<tr>
<td>• BP 140/90 mmHg or more before 20 weeks of gestation</td>
<td>Chronic hypertension with superimposed pre-eclampsia</td>
</tr>
<tr>
<td>• Proteinuria</td>
<td>Pregnancy-induced hypertension</td>
</tr>
<tr>
<td>• Two readings of BP 140/90 mmHg or more, taken at least 4 hours apart, after 20 weeks of gestation</td>
<td>Mild pre-eclampsia</td>
</tr>
<tr>
<td>• No proteinuria</td>
<td>Severe pre-eclampsia</td>
</tr>
</tbody>
</table>

Severe pre-eclampsia PLUS any two of the following:
• Headache (increasing frequency, unrelieved by regular analgesics)
• Clouding of vision
• Pain in the upper abdomen (epigastric pain or pain in the right upper quadrant)
• Oliguria (passing less than 400 ml urine in 24 hours)
• Hyperreflexia (exaggerated knee jerk)
• Pulmonary oedema

• Convulsions | Eclampsia |
• BP 140/90 mmHg or more after 20 weeks of gestation; rarely only 110/90 mmHg | Eclampsia |
• Proteinuria 2+ or more | Eclampsia |
Management of pre-eclampsia

At each prenatal visit, check the woman's BP, test the urine for the presence of protein; examine her for generalized body oedema; and note her weight. Encourage every pregnant woman to come for the first ANC visit as early as possible in their pregnancy so that a baseline value for their BP can be obtained. If there is a rise in the BP, monitor the woman's BP weekly.

Mild pre-eclampsia

Gestation less than 37 weeks

Allow the woman to stay at home and advise her to rest as much as possible. Ask her to return to the PHC every week or ask the ANM in charge to ensure a weekly domiciliary visit for giving the following care to the woman.

At each visit:

* Check the BP
* Test the urine for the presence of protein
* Weigh the patient
* Check for generalized body oedema
* Exclude symptoms of severe pre-eclampsia
* Monitor foetal growth, ask the woman about foetal movements
* Check the FHR.

Book the woman for delivery at the PHC.

Gestation more than 37 weeks

In case there are signs of foetal compromise, assess the cervix and expedite delivery.

Admit the woman to a hospital for observation and management. In the hospital:

* Let the woman rest in a quiet room
* Check the BP 4-hourly (2-hourly if the woman is severely affected)
* Test the urine for the presence of protein twice daily
* Monitor the FHR twice daily
* Weigh the woman twice weekly, if possible
* Give sedation (e.g. Diazepam; for dosage see later in this chapter under “Diazepam”)
* Give antihypertensive drugs only if the diastolic pressure is 110 mmHg or more.

Eclampsia (or severe pre-eclampsia)

Eclamptic fits can begin before, during or after delivery. The management is the same in each case but if the patient has not delivered, carry out the delivery as soon as possible.

The management of eclampsia involves six major steps:

1. Making sure that the woman can breathe
2. Controlling the fits
1. **Making sure that the woman can breathe**

This is achieved in four steps:

- Place the woman on her left side (in the semi-prone position) so that mucus or saliva can drain out, for, with deep breathing, there is a grave danger of inhaling mucus and saliva.
- Clean the mouth and nostrils by applying gentle suction and remove the secretions.
- Give oxygen (if available) and continue for five minutes after each fit, or longer if cyanosis persists.
- Instruct the nursing staff to make sure that:
  - the patient’s airway remains clear;
  - injury, especially to the tongue (tongue bite), is prevented during the clonic stage of convulsions; this can be done by placing padded tongue blades or pads between her teeth, which are secured to prevent aspiration. (Do NOT attempt this during a convolution.)

2. **Controlling the fits**

There are two widely accepted drugs for controlling fits: Magnesium sulphate or Diazepam. Remember, Diazepam is not the drug of first choice for managing eclamptic fits. It should be used only when Magnesium sulphate is not available.

**Magnesium sulphate**

**Administration of the drug:** For the loading dose, give Inj. Magnesium sulphate 4 g (20 ml of 20% solution), slow IV, at the rate of 1 ml every minute. **Magnesium sulphate should not be given as a bolus.** (The woman may feel warm during the injection.)

Thereafter, also administer Inj. Magnesium sulphate IM. Initially, 5 g should be injected into each gluteus muscle (10 ml of 50% solution, in each buttock), deep IM, with 1 ml of 2% Lignocaine in the same syringe.

If the staff is not trained in administration of IV, give Inj. Magnesium sulphate through the IM route only.

**If convulsions recur:** After 15 minutes, give an additional 2 g of Magnesium sulphate (10 ml of 20% solution) IV over 20 minutes. If the convulsions still continue, give Diazepam.

**If referral is delayed** for long, or the woman is in the late stage of labour, continue treatment as below:

Give 5 g of 50% Magnesium sulphate solution IM with 1 ml of 2% Lignocaine every 4 hours alternately in each buttock. Catheterize her and refer her to an FRU immediately.

Before giving the next dose of Magnesium sulphate, ensure that:

- The urine output is at least 100 ml per 4 hours;
- Knee jerk reflexes are present;
- The RR is at least 16 breaths/minute.

* Postpone the next dose if the above criteria are not met.
**Advantage**: Magnesium sulphate has been shown to be more effective than Diazepam or Phenytoin in preventing the recurrence of fits.

**Disadvantage**: Magnesium sulphate can cause respiratory depression in the mother and foetus. This is why a rapid IV infusion should be avoided.

**Precautions**: Do NOT give 50% Magnesium sulphate solution IV without diluting it to 20%.

Do NOT give a rapid IV infusion of Magnesium sulphate as it can cause respiratory failure or death.

If respiratory depression occurs (RR <16 breaths/minute) after giving Magnesium sulphate, discontinue the drug. Give the antidote, Calcium gluconate 1 g IV (10 ml of 10% solution) over a period of 10 minutes.

**Diazepam**

Diazepam is not the drug of first choice for a case of eclampsia. As per the Cochrane Review, Magnesium sulphate appears to be substantially more effective than Diazepam for the treatment of eclampsia. It should be used only when Magnesium sulphate is not available.

**Administration of the drug**: Loading dose: Give 10 mg of Diazepam IV slowly over a period of 2 minutes. If convulsions recur, repeat the dose.

Maintenance dose: Give Diazepam 40 mg in 500 ml of IV fluids (Ringer lactate [R/L] or normal saline) titrated over 6-8 hours to keep the woman sedated but rousable. Do not give more than 100 mg in 24 hours.

Diazepam may also be given by the rectal route in case IV access is not possible [see Box 9 later in this chapter].

**Advantage**: Diazepam may be more readily available than Magnesium sulphate.

**Disadvantage**: Diazepam can cross the placenta and cause problems in the foetus such as maintaining the body temperature and breathing difficulties while feeding.

**Precautions**: Diazepam can cause respiratory depression. Therefore, if the RR becomes <16 breaths/minute, stop the maintenance dose; give assisted ventilation using a bag and mask, if required.

Never give Diazepam as an IV bolus as it can cause cardiac arrest.

If there is maternal respiratory depression due to the use of Diazepam, it may compromise the foetus too. Hence, if delivery is imminent, one should be prepared for neonatal resuscitation.

An excessive dose of Diazepam also increases the chances of hyperbilirubinaemia in the neonate.

3. **Controlling the blood pressure**

**Antihypertensive therapy**: During a normal pregnancy, there are considerable changes in the BP. The BP falls within the early weeks, largely due to general relaxation of the muscles within the blood vessels. From around the middle of the pregnancy, it rises slowly again until, at term, the BP is close to the level it was before pregnancy. During pregnancy, the BP can be influenced by many factors including the time of day, physical activity, position and anxiety. High BP alone has little effect on the outcome of pregnancy, but a rise in the BP is associated with other complications of which the most common is pre-eclampsia. Keeping in view the many factors that can influence BP, it is not surprising that there is often uncertainty about whether a specific abnormal reading is potentially harmful for the woman. If the diastolic BP is 110 mmHg or more, antihypertensives are highly recommended. The goal of treatment is to keep the diastolic pressure between 90
and 100 mmHg to prevent cerebral haemorrhage. This management can be given for eclampsia, fulminating pre-eclampsia or severe pre-eclampsia.

There is no good evidence that any one antihypertensive is better than another for reducing the BP. However, Diazoxide is best avoided.

**Hydralazine**: Give Hydralazine 5 mg, slow IV. Take 3-4 minutes to give the injection. Monitor the BP carefully during this time.

Refer the woman immediately to an FRU. If the diastolic BP remains >90 mmHg during transportation, you can repeat the dose at 30-minute intervals, until the diastolic BP is around 90 mmHg. Do not give more than 20 mg in total.

**Advantage**: Hydralazine will reduce the BP quickly even when the hypertension is severe. It does not cause semi-consciousness and its associated problems.

**Disadvantages**: In the mother, Hydralazine may cause:
- tachycardia
- nausea and vomiting
- headache
- muscle tremors.

There may also be foetal distress; a sudden fall in the BP might reduce the amount of blood flowing through the uterus and placenta.

**Nifedipine**

In case Hydralazine is not available, Nifedipine is the next drug of choice for controlling the BP.

**Dose and administration**: The dose of Nifedipine is 5 mg orally. To avoid sudden hypotension, it is recommended that a 5 mg capsule of Nifedipine be punctured and initially only half the contents of the capsule, i.e. 2.5 mg of Nifedipine be given orally or sublingually to the woman. After 5 minutes, monitor the BP. If it is not dangerously low, give the remaining 2.5 mg, again, orally or sublingually. If the BP is still not brought under control, another 5 mg of the drug can be repeated similarly.

**Disadvantage**: Nifedipine may cause a sudden and massive fall in BP. Hence, it should be used with caution, and the dose delivered slowly.

**Precaution**: Nifedipine, when used in conjunction with Magnesium sulphate, can cause a dangerous fall in BP. Hence, when Nifedipine and Magnesium sulphate are used together, the BP should be monitored carefully.

4. **Controlling the fluid balance**

Insert an indwelling urinary catheter with an open drainage system to measure the urinary output. Record the urine output every 4 hours. Suspect kidney failure if the urine output is less than 100 ml per 4 hours.

Record the fluid intake. Give all the necessary fluids slow IV. The patient should receive sodium lactate or 5% dextrose @ 60 ml (maximum) per hour unless there is an unusual fluid loss from vomiting, diarrhoea, or excessive blood loss at delivery.
Maintenance of proper fluid balance is essential to prevent water intoxication, dehydration, hyponatraemia, or pulmonary oedema.

Diuretics should not be used. As such, diuretics are contraindicated in pregnancy, and in these conditions, the uroplacental perfusion is already reduced, e.g. in pre-eclampsia, IUGR.

5. Delivering the baby

You, as the M.O., should decide on the method of delivery depending on whether or not the woman has gone into labour, and the stage and progress of labour. In severe pre-eclampsia, delivery should occur within 24 hours of the onset of symptoms; in eclampsia, delivery should occur within 12 hours of the onset of convulsions.

If a vaginal delivery is not anticipated, or the cervix appears unfavourable, or there are signs of foetal distress, refer to a specialist at an FRU at the earliest.

Before labour, or in the latent phase of labour

It is always better to refer all cases of hypertensive disorders of pregnancy to an FRU, after initial management, such as controlling the BP, controlling convulsions (if present), starting IV fluids, etc. This is done to avoid the development of other complications which cannot be managed at the PHC level.

Active phase of the first stage of labour, or second stage of labour

A woman in the late first stage of labour can be delivered better if referred to an FRU. If immediate referral is difficult due to any reason (such as a long distance to the FRU or transportation problems), and you anticipate that the woman might not be able to reach the FRU in time for her delivery, carry out a vaginal delivery at the PHC. However, if there is an anticipated or actual delay in the progress of labour and delivery, refer the woman to an FRU immediately. While managing the labour and delivery at the PHC, ensure that:

- the labour is progressing quickly and
- there are no contraindications to a vaginal delivery (such as CPD).

Difficult deliveries must be avoided at the PHC.

All patients with eclampsia in the second stage of labour should be delivered at the PHC and then, after giving routine immediate postpartum care, the woman should be referred to an FRU for further management.

Hence, the thumb rule for deciding upon the management option is:

If a woman with a hypertensive disorder of pregnancy presents to you in the early first stage of labour, refer her to an FRU. However, if she is in the late first stage or second stage of labour, conduct the delivery and then refer the woman to an FRU for further management.

6. Giving care after delivery

It is important to realize that fits can occur for the first time after delivery, especially during the immediate postpartum period. Fits, if they have occurred before delivery, can also recur after delivery. Therefore, the patient must be carefully observed during the immediate postpartum period.
Points to be noted in providing care during the postpartum period:

• Refer the woman to an FRU one hour after delivery, after ruling out immediate PPH, and ensure that the woman’s condition is stable.

• If the patient has fits after delivery, continue to observe and manage her for 48 hours after the last fit (if she has not been referred to an FRU due to some problems).

• Nurse the patient in the labour ward or other area of intensive care (if present) where she can be closely observed.

• Continue treatment as required (and as mentioned before).

• Monitor the BP every hour. Continue giving antihypertensives as and when required, until the diastolic BP drops below 110 mmHg.

• Monitor the urinary output carefully. A woman in such a condition tends to retain fluid. This is because the kidneys are slow to excrete the extra circulating fluid after delivery. This may lead to a rise in the BP. Be careful not to give too much fluid intravenously during this period.

• If, after 48 hours, there are no fits, the urinary output is good and the diastolic BP is below 100 mmHg, the patient can be discharged.

• Advise the woman to have her BP checked every 4 hours for a few days. Intimate the condition of the woman and this advice to the ANM in charge. If regular BP checks are not feasible at home, do not discharge the woman for at least 72 hours after delivery.

• Arrange for follow up 7-10 days after delivery.

Problems and complications:

Continued fits: REFER SUCH CASES TO AN FRU WITHOUT ANY DELAY.

Following eclampsia, the BP may:

- return to normal within a few days of delivery (within 2-3 days or 48-72 hours)
- return to normal after a few weeks
- remain high permanently.

You will have to decide on the method of management. Usually during the first week postpartum, further doses of drugs are given, e.g. Hydralazine is given if the diastolic the BP rises above 110 mmHg. If the BP is still very high 48 hours after delivery, a standard antihypertensive regimen should be started. The patient must then be reassessed by you, or a physician, who will decide whether long-term management is necessary.

Anticonvulsive and antihypertensive drugs schedules

If Magnesium sulphate is not available, an alternative is Diazepam, although there is a greater risk of neonatal respiratory depression because diazepam crosses the placenta freely. A single dose of diazepam to abort a convolution seldom causes respiratory depression in the newborn. Long-term continuous IV administration increases the risk of respiratory depression in babies who may already be suffering from the effects of uteroplacental ischaemia and preterm birth. The effect may last for several days.
Box 8: Magnesium sulphate schedules for severe pre-eclampsia and eclampsia

Magnesium sulphate is the drug of choice for preventing and treating convulsions in severe pre-eclampsia and eclampsia.

Loading dose

- Give Magnesium sulphate 4 g IV as 20% solution (20 ml) over a period of 5 minutes.
  (A 20% solution can be prepared by diluting 50% Magnesium sulphate solution with water for injection. Take 8 ml of the 50% solution and 12 ml of the diluting fluid to prepare 20 ml of the 20% solution.)
- Follow promptly with 10 g of 50% Magnesium sulphate solution (20 ml), 5 g (10 ml) in each buttock as deep IM injection with 1 ml of 2% Lignocaine in the same syringe. Ensure an aseptic technique while giving an injection of Magnesium sulphate deep IM. Explain to the woman that she might feel warm when Magnesium sulphate is given.

If convulsions recur after 15 minutes

- Give 2 g of Magnesium sulphate as 20% solution (10 ml) IV over 5 minutes.

Maintenance dose

- 5 g of Magnesium sulphate is given as 50% solution (10 ml) + 1 ml of 2% Lignocaine IM every 4 hours into alternate buttocks.
- Treatment with Magnesium sulphate should be continued for 24 hours after delivery or the last convulsion, whichever occurs later.
- Before repeat administration, ensure that:
  — the RR is at least 16 breaths/minute
  — knee jerk reflexes are present
  — the urinary output is at least 25-30 ml per hour for 4 hours (100 ml in 4 hours).
- Keep the antidote ready (Calcium gluconate, 1 g IV, 10 ml of 10% solution for 10 minutes)
- In case of respiratory arrest:
  — provide assisted ventilation (mask and bag)
  — give Calcium gluconate 1 g (10 ml of 10% solution) IV slowly until respiration begins. This drug immediately antagonizes the effects of Magnesium sulphate.
Box 9: Diazepam schedules for severe pre-eclampsia and eclampsia

NOTE: Use Diazepam only if Magnesium sulphate is not available.

A. Intravenous administration

Loading dose
Diazepam 10 mg IV slowly over a period of 2 minutes.
If the convulsions recur, repeat the loading dose.

Maintenance dose
Diazepam 40 mg in 500 ml IV fluids (R/L or normal saline) titrated over 6-8 hours to keep the woman sedated but rousable.
Provide assisted ventilation (mask and bag, anaesthesia apparatus, endotracheal intubation), if necessary.
Do not give more than 100 mg in 24 hours.

B. Rectal administration

Loading dose
Give Diazepam rectally when IV access is not possible. The loading dose is 20 mg (4 ml) in a 10 ml syringe (or a urinary catheter).
Remove the needle, lubricate the barrel and insert the syringe into the rectum to half its length. Discharge the contents and leave the syringe in place, holding the buttocks together for 10 minutes to prevent expulsion of the drug.
If the convulsions are not controlled within 10 minutes, or they recur, give another 10 mg (2 ml).

Maintenance dose
Administer an additional 10 mg (2 ml) per hour during transport. Refer to a higher health facility.
**Box 10 : Antihypertensive drugs for PIH**

If the **diastolic pressure is 110 mmHg or more**, give antihypertensive drugs. The goal is to keep the diastolic pressure between 90 mmHg and 100 mmHg to prevent cerebral haemorrhage. Hydralazine is the drug of choice.

- **Hydralazine**
  - Give Hydralazine 5 mg IV slowly (3-4 minutes) until the BP is lowered. If it is not possible to give the drug IV, give it IM.
  - If the diastolic pressure remains >90 mmHg, repeat the dose at 30-minute intervals until the diastolic BP is around 90 mmHg.
  - Do not give more than a total of 20 mg.

- **Nifedipine**
  - Give Nifedipine if **Hydralazine is not available**. Puncture a 5 mg capsule, squeeze out half the contents (2.5 mg) and give it orally or sublingually.
  - Monitor the BP after 5 minutes. If there is no precipitous fall in the BP, give the remaining 2.5 mg in a similar manner.
  - If the response is inadequate (diastolic pressure remains above 110 mmHg) after 10 minutes, give an additional 5 mg as above.
  - There is a concern regarding the possibility for an interaction with Magnesium sulphate that can lead to hypotension. Nifedipine should only be used as a second line of treatment.

**Chart 4 : Management of pre-eclampsia and eclampsia**

- **Severe headache/blurring and/or upper abdominal pain**
  - Check the blood pressure (BP)
  - Manage if the diastolic BP is between 90 and 110 mmHg.
  - Refer to a first referral unit (FRU) if the diastolic BP is more than 110 mmHg.
  - If in the late first or second stage of labour, conduct the delivery and then refer to an FRU after the woman’s condition stabilizes.

- **Convulsions with or without coma**
  - Maintain respiration
  - Give Magnesium sulphate (loading dose).
  - Give Hydralazine 5 mg IV slowly, or Nifedipine 5 mg, if the diastolic BP >110 mmHg.
  - Refer the woman to an FRU.
  - If in the late first or second stage of labour, conduct the delivery and then refer to an FRU after the woman’s condition stabilizes.
Definitions

Prolonged labour

Prolonged labour is active labour with regular uterine contractions but without adequate cervical dilatation and/or descent of the presenting part, lasting for more than 12 hours.

Prolonged labour can be due to:

* Incoordinate uterine contractions: These are contractions that are weak or not effective enough to result in cervical dilatation and/or foetal descent. There is no mechanical obstruction in these cases. If not managed properly, these cases may ultimately develop uterine fatigue. An ascending infection may also occur, especially if the membranes have ruptured. There is a danger of foetal death in these cases.

* Foetopelvic disproportion: This means that it is difficult or impossible for the foetus to pass safely through the pelvis. As the cephalic end is the most common presenting part, this condition is also known as Cephalopelvic disproportion (CPD). This condition, if not managed in time, will lead to obstructed labour.

CPD occurs when the foetal head is large compared with the pelvis. CPD may be due to a small pelvis with a normal-sized head, or a normal pelvis with a large foetus, or a combination of a large baby and small pelvis. CPD cannot be diagnosed before the 37th week because before then the head has not reached its birth size.

Obstructed labour

Obstructed labour means that, in spite of strong uterine contractions, the foetus cannot descend because of mechanical factors. Obstruction may occur at the inlet, within the cavity or outlet of the pelvis.

Though CPD is the commonest cause of obstructed labour, other factors such as malpresentation (transverse lie, brow presentation, mentoposterior presentation) and rarely large tumours in the pelvis may cause mechanical obstruction leading to obstructed labour.

Complications resulting from obstructed labour can be avoided if a woman in obstructed labour is identified early, and appropriate action is taken. In such cases, a caesarean section is often required for delivery.

Diagnosis of prolonged/obstructed labour

A partograph, as described earlier [see Module 1, Chapter 2: "Care during labour and delivery-intrapartum care"], is a tool to assess the progress of labour. When, despite good uterine contractions for 8 hours, the woman is still in the latent phase of labour, or when the partograph crosses the “Alert line” it is an indication that the labour is not progressing normally and that the woman needs referral to an FRU, or any other health facility where facilities for surgical intervention are available.

Complications following obstructed labour

Maternal complications

Premature rupture of membranes

This is due to the extra force on that portion of the membranes in contact with the internal os. This can subsequently lead to an ascending infection and foetal and/or maternal death [see Module 2, Chapter 6d: "Premature rupture of membranes"].
Slow dilatation or oedema of the cervix
This is due to inadequate pressure of the foetal presenting part on the cervix causing no or slow dilatation. It may also lead to an oedematous cervix, further preventing descent of the head.

Maternal fatigue
Due to prolonged labour, the mother may be dehydrated and may go into ketoacidosis.

Uterine rupture
This occurs when there is rupture of the membranes and the amniotic fluid has drained away. The uterus is tonically retracted over the foetus and does not relax at all. In these cases the foetal parts cannot be palpated clearly. Alternatively, the foetus is forced into the lower uterine segment and, with continuing uterine contractions, the lower segment becomes thin and is likely to rupture.

Rupture of the uterus following obstructed labour is more common in multiparous women and in those with a uterine scar due to a previous caesarean section.

Rupture of the uterus results in haemorrhage (usually internal) and shock. It is usually fatal if not managed immediately.

Puerperal sepsis
The chances of infection are increased due to premature rupture of the membranes and the increased frequency of vaginal examinations that health personnel undertake in these circumstances [see Module 2, Chapter 4: "Puerperal sepsis"].

Fistulae
These occur due to excessive pressure on the tissues of the bladder, vagina and rectum, which are trapped between the obstructed foetal head and the pelvic bones. Due to decreased oxygenation, the tissues undergo necrosis, forming various types of fistulae such as vesicovaginal (between the bladder and vagina), vesicocervical (between the bladder and the cervix), or rectovaginal (between the rectum and vagina). These fistulae allow leakage of urine or faeces from the vagina, and represent the extreme morbid conditions that may occur following an unmanaged or poorly managed obstructed labour.

Maternal death
The mother may die either due to uterine rupture and the resultant haemorrhage and shock, or death may result from the DIC triggered by decay of the dead foetus [see below].

Foetal complications
Caput succedaneum
This is a boggy swelling on the foetal scalp formed due to pressure of the maternal pelvic bones on the foetal skull. It usually subsides on its own after a few days.

Excessive moulding of the foetal skull
This may cause a change in the shape of the baby's head.

Birth asphyxia and its complications
This is a dangerous complication. The foetus is deprived of the necessary oxygenation while the mother is in
labour. This can lead to foetal death/stillbirth. If the baby survives, it may have complications resulting from birth asphyxia, such as cerebral palsy and/or mental retardation.

**Foetal death**
This may occur due to prolonged, excessive pressure on the placenta and umbilical cord, leading to decreased oxygenation and death of the foetus.

**Clinical picture**

**History**
The following points must be asked to any woman who comes to the PHC with suspected obstructed/ prolonged labour.

**Age**
A teenage mother has greater chances of going into obstructed labour as her pelvic bones and the shape of her pelvis has not developed enough physically to allow the foetus to deliver normally.

**Parity**
Though there is no difference in the incidence of obstructed labour between a primipara or a multipara, the risk of uterine rupture as a complication of obstructed labour is much higher in a multiparous woman.

**Previous operative delivery**
The indication for the previous operative delivery (if present) will give an insight into the probability of a foetopelvic disproportion during the present delivery. Also, the presence of a previous uterine scar following a caesarean section puts the woman at greater risk of having a uterine rupture following obstructed labour.

**Previous stillbirth**
The cause of the stillbirth, such as birth asphyxia, will tell you whether the woman is at risk of suffering from the same complication again in the present pregnancy.

**Duration of labour so far**
This is important to decide whether you can still wait or need to refer the woman urgently to an FRU for operative intervention. A partograph at this stage will also help to decide whether the woman has crossed the alert/action line.

**Previous history of babies with developmental anomalies**
A previous history of developmental anomalies increases the chances of the present baby having one also. Developmental anomalies are one of the main causes of obstructed labour, and are therefore often associated with it.

**Progress of labour**
The woman may complain of excessive abdominal pain, or give a history that initially the labour had proceeded normally followed by sudden stoppage of the pains and contractions. Such a history points towards the stage of uterine inertia, which usually occurs following a prolonged labour.
Rupture of the membranes and their timing
Obstructed labour predisposes to premature rupture of the membranes which, in turn, results in an increased frequency of puerperal sepsis during the postpartum period.

If the membranes have ruptured, ask for or note the colour of the amniotic fluid to assess the presence of foetal distress.

*Inj. Oxytocin*

Ask the woman and/or her family if she has received Inj. Oxytocin before coming to the PHC. If she has, what was the total dose received? Giving Inj. Oxytocin in such cases increases uterine contractions and the chances of uterine rupture.

**Examination**

*General examination*

In cases of obstructed labour, the following signs are present:

- Physical and mental exhaustion
- Dehydration and ketoacidosis (ketonuria, dry mouth, tachycardia)
- Fever (in cases of sepsis)
- Shock (as evidenced by tachycardia, low BP, cold extremities, pale complexion, history of oliguria or anuria). The cause of shock may be a ruptured uterus or sepsis.

*Abdominal examination*

In cases of obstructed labour, abdominal examination may reveal the following:

- The foetal head (or the presenting part) can be felt above the pelvic brim because it is unable to descend.
- The woman may have frequent and strong uterine contractions. But if she has been in labour for a long time, the contractions may have stopped because of uterine exhaustion/inertia or because of rupture of the uterus.
- The uterus may have gone into tonic contraction and is tightly moulded around the foetus.
- Bandl's ring may be seen

* Bandl's ring is the name given to the area between the upper and lower uterine segments when it becomes visible and/or palpable during labour. During normal pregnancy and labour, this area is called a retraction ring. It should not normally be seen or felt on abdominal examination.

* Bandl's ring is a late sign of obstructed labour. It can be seen as a depression across the abdomen at about the level of the umbilicus. Above this is the retracted upper uterine segment. Below the Bandl's ring is the distended lower uterine segment. This is dangerously thin and can rupture if not managed in time. A distended lower uterine segment is not the only cause of a bloated lower abdomen. The lower abdomen can be further distended by a full bladder and gas in the intestines.

* The shape of the uterus looks like a peanut shell.
* Palpation will confirm the signs noted on observation.

- Foetal condition: Try and listen for the FHS. An FHR of <120 beats/minute or >160 beats/minute is indicative of foetal distress *(see Module 2, Chapter 7b: "Foetal distress").*
Vaginal examination

Look for the following danger signs related to obstruction:

- Discharge from the vagina
  - Foul-smelling meconium may be seen draining from the vagina. It indicates foetal distress with possible infection.
  - The amniotic fluid may have already drained away. This is dangerous with regard to survival of the foetus.

Vaginal examination

- Oedema of the vulva may be seen, especially if the woman has been bearing down for a long time;
- The vagina may be hot and dry because of dehydration;
- Oedema of the cervix may be present; this further prevents descent of the head;
- Incomplete dilatation of the cervix (in mid-cavity obstruction; though the cervix may be fully dilated in the case of outlet obstruction);
- A large caput succedaneum, or any other abnormal presentation, can be felt;
- The cause of the obstruction may be felt, e.g. a severely moulded head stuck in the pelvis, shoulder presentation, any other abnormal presentation, prolapsed arm, or a compound presentation such as head with hand, cord, etc.

Urine examination

Test the woman's urine for the presence of ketone bodies using a ketostix, if available (ketonuria is present in ketoacidosis and dehydration). Treat with IV fluids (R/L) if ketosis is present.

Symptoms and signs suggestive of ruptured uterus

Symptoms

- Shock may be present
- There is severe abdominal pain
- Vaginal bleeding may or may not be present

Signs on abdominal examination

- Abdominal tenderness is present
- The foetal parts felt superficially
- The uterine contour is not felt
- The FHS is not heard

Signs on vaginal examination

- The presenting foetal part is either very high up, or may not be felt at all.
Management of obstructed labour

1. Rehydrate the patient

It is essential to maintain a normal plasma volume and prevent or treat dehydration and ketosis.

(a) Start an IV line. Use a large needle (no. 18) or cannula [see Annexure 14: "Inserting an IV line and giving IV fluids"]).

(b) Infuse with R/L or normal saline.

(c) Run the fluid at a moderate rate of approximately 25-30 drops/minute.

2. Give antibiotics

To prevent puerperal sepsis, which may occur due to frequent vaginal examinations and premature rupture of membranes, the following antibiotics need to be administered to the woman:

* Inj. Ampicillin 1 g IV, after sensitivity testing (AST)
* Inj. Gentamicin 80 mg IV
* Inj. Metronidazole 400 mg, preferably IV (if available), otherwise orally.

3. Refer the patient

Refer the woman immediately to an FRU as operative intervention is usually required to relieve the obstruction and deliver the baby.

Chart 5: Management of suspected obstructed labour
**Definition**

Puerperal sepsis is 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 in which any two or more of the following signs and symptoms are present:

- Fever of 38.5 ºC or higher, measured orally on any one occasion;
- Abnormal vaginal discharge;
- Abnormal smell, foul odour of the vaginal discharge;
- Pelvic pain;
- Delay in the rate of reduction of the size of the uterus (subinvolution of the uterus; <2 cm/day).

**How puerperal sepsis occurs**

Puerperal sepsis occurs due to colonization of the genital tract by microorganisms. These organisms can be introduced from within (infection of endogenous origin), or from outside (infection of exogenous origin).

Endogenous infections are caused by bacteria that normally live in the vagina and rectum without causing harm (commensals). These bacteria can become harmful if:

* They are brought into the uterus by the examining finger or by instruments during pelvic examinations
* There is bruised, lacerated or dead tissue
* They ascend into the uterus during premature and prolonged rupture of the membranes.

Exogenous infections are introduced into the vagina from outside the body, by:

* Unclean hands and unsterile instruments
* Foreign substances introduced into the vagina, e.g. herbs oils, etc. during an illegal and unsafe abortion
* By sexual activity.

Puerperal sepsis can occur both intrapartum and postpartum.

* During the intrapartum period, due to PROM, the bacteria ascend and can cause chorio-amnionitis. This is a very serious condition and can endanger the life of both the mother and the baby.
* During the postpartum period, puerperal sepsis may be localized to the perineum, vagina, cervix or uterus; or it can spread and also infect the fallopian tubes, the ovaries, etc. It can lead to parametritis, peritonitis and even septicaemia. It can result in complications such as DIC, and can be rapidly fatal for the woman.

Women are vulnerable to infection during the puerperium due to the large, raw placental site that is warm, dark and moist. It has a rich blood supply. The site is not far from the outside environment and the rectum. These factors make it very easy for bacteria to enter and colonize the genital tract. The scars in the cervix, vagina, and/or perineum which may have occurred during the birthing process make the genital tract even more susceptible to infection, and for the infection to spread to the underlying tissues.

The most common site of infection in puerperal sepsis is the placental site in the uterus. Other sites of infection are tears of the cervix, vagina, perineum and the site of episiotomy.
Risk factors for puerperal sepsis

Patient-related risk factors
• Poor patient hygiene
• Pre-existing anaemia and malnutrition
• Pre-existing sexually transmitted infections (STIs)/RTIs
• Not immunized against tetanus
• Pre-existing diabetes

Risk factors related to the delivery process and interventions
• Failure to follow aseptic techniques
• Frequent vaginal examinations
• Manipulations high in the birth canal
• Presence of dead tissue in the birth canal (due to IUD, retained placental fragments or fragments of membranes, necrosis of tissue due to prolonged labour, etc.)
• PROM
• Prolonged/obstructed labour
• Caesarean section, or other assisted deliver (forceps, ventouse)
• Unrepaired vaginal/cervical lacerations
• PPH

Risk factors related to health service delivery
• Delivery by untrained persons
• Lack of asepsis during delivery
• Lack of routine postpartum care
• Inadequate monitoring of the temperature during prolonged labour and after delivery
• Non-availability of proper antibiotics
• Inadequate management with appropriate antibiotics in a case in whom puerperal sepsis has set in
• Further operative intervention in a case where puerperal sepsis has set in

Causes of fever in the puerperium

Infectious causes
1. Puerperal sepsis, depending on how far it has spread, may present as:
   • Localized infection of a vaginal/cervical laceration or episiotomy;
   • Infection of a laceration or episiotomy which has spread to the underlying soft tissue, e.g. ischiorectal abscess;
   • Infection of the uterine lining-endometritis;
   • Infection of the fallopian tubes-salpingitis;
   • Parametritis;
   • Generalized peritonitis;
   • Septic thrombophlebitis;
• Tubo-ovarian abscess;
• Broad ligament abscess;
• Abscess in the pouch of Douglas (peritoneal abscess);
• Abscesses at other sites in the abdomen or chest;
• Septicaemia (an infection that has entered the blood stream and is a very serious condition);
• Septic shock (may complicate septicaemia).

2. Breast infection such as mastitis or, at a later stage, breast abscess

3. UTI

4. Wound infection (e.g. of the caesarean section incision)

5. Thromboembolic disorders, including superficial thrombophlebitis and deep vein thrombosis, sometimes give rise to fever and tachycardia.

Non-infectious causes
Low-grade fever is very common in the postpartum period, especially in the first 24 hours. The causes include dehydration, tissue trauma, reaction to foetal proteins and breast engorgement. Although fever occurring in the first 24 hours after delivery has generally been regarded as being unrelated to infection, a temperature of 38.5 ºC or higher within the first 24 hours should alert you to the possibility of puerperal sepsis developing in the patient.

Management of puerperal sepsis
• The basic principles of infection control should be followed to prevent the spread of infection to other women and their babies.
• Women will die of puerperal sepsis and septicaemia if appropriate antibiotic therapy is not given early enough. The aim of starting antibiotic therapy immediately is to manage/treat the current infection and to stop it from spreading further.

Antibiotics
Give the first dose of the following regimen of antibiotics and refer the woman to an FRU as soon as possible:

• If the woman is not very sick (e.g. there is no fever or it is low grade, the pulse is not very high, and the consciousness is normal), you may start the woman on:
  Cap. Ampicillin 1 g stat orally PLUS Tab. Metronidazole 400 mg orally PLUS Inj. Gentamicin 80 mg IM

• If the woman is very sick (e.g. she has very high fever, a rapid pulse, appears confused), more than one microorganism is usually involved. A combination of antibiotics which provide as broad a coverage as possible should be given, preferably through the parenteral route. A useful regime is:
  Inj. Ampicillin 1 g IV stat PLUS Metronidazole 400 mg IV, PLUS Inj. Gentamicin 80 mg IM

Give plenty of fluids
The aim of this is to correct or prevent dehydration and to help bring down the fever.

In severe cases (e.g. if the woman is in shock or is in a confused, delirious state), it is necessary to give IV fluids immediately. If the woman is conscious and there is no indication that a general anaesthetic may be
needed in the next few hours, she should also be given oral fluids. In mild cases, a simple increase in the oral fluid intake is sufficient.

**Rule out the presence of retained placental fragments**

Retained placental fragments can be a cause of puerperal sepsis. Suspect this if the uterus is soft and bulky and if the lochia is excessive and contains blood clots. Refer the woman to an FRU that has the equipment and health care personnel trained to perform curettage.

**Refer to an FRU**

Refer the woman as soon as possible to an FRU after initiating the required treatment. It is important to write a full description of the treatment offered in the referral card. Ask the ANM in charge of the area to follow up the condition of the woman after she is discharged from the FRU.

**Tetanus toxoid**

If there is a possibility that the woman was exposed to tetanus (if, for example, cow dung, mud or herbs were inserted into the vagina), and there is uncertainty about her vaccination history, then give her TT. A case of tetanus needs management that will not be possible in a PHC setting. Hence, the woman must be urgently referred to an FRU.

**Provide skilled nursing care**

This requires careful attention. Nursing staff must be instructed to ensure the following:

- Advise the woman to take bed rest;
- Monitor vital signs (temperature, pulse, BP, RR);
- Measure intake and output of fluids;
- Keep an accurate record of the medicines given;
- Prevent the spread of infection and cross-infection.
Definition
Anaemia in pregnancy is defined as a Hb level of <11 g/dl during pregnancy (and in the immediate postpartum period). A pregnant woman with a Hb level of <7 g/dl is said to have severe anaemia.

Diagnosis
Examine and investigate the woman for the following:

- Conjunctival pallor
- Severe palmar pallor
- Pallor of the tongue, palate and oral mucosa
- RR (count for 1 minute)
- Level of Hb [see Annexure 4: "Estimating the level of haemoglobin"]

Table 15: Diagnosis of anaemia and its severity

<table>
<thead>
<tr>
<th>Symptoms and signs</th>
<th>Probable diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haemoglobin &gt;11 g/dl No pallor</td>
<td>No clinical anaemia</td>
</tr>
<tr>
<td>Haemoglobin 7-11 g/dl OR Palmar or conjunctival pallor</td>
<td>Moderate anaemia</td>
</tr>
<tr>
<td>Haemoglobin &lt;7 g/dl AND/OR Severe palmar and conjunctival pallor or any pallor with any of the following:* &gt;30 breaths/minute * Easy fatiguability * Breathlessness at rest</td>
<td>Severe anaemia</td>
</tr>
</tbody>
</table>

Management

No anaemia
- Give IFA tablet (with 100 mg elemental iron and 0.5 mg folic acid) once daily for 100 days (3 months) starting after the first trimester.
- Counsel the woman on the need for compliance with treatment.

Moderate anaemia
- Give double the prophylactic dose of IFA, i.e. 1 tablet twice daily for 100 days (3 months).
- Counsel the woman on the need for compliance with treatment.
- Give appropriate antimalarial drugs in accordance with the NAMP guidelines, especially if you are in a malaria-endemic zone.
- Give the woman an antihelminthic for deworming (Mebendazole 500 mg stat, or Albendazole 400 mg stat), especially if you are in a hookworm-endemic area. Do NOT give Albendazole in the first trimester; but it is safe for use from the second trimester onwards.
Reassess the woman after one month.
If the Hb level increases, continue treatment.
However, if anaemia persists, refer the woman to an FRU for typing the anaemia, finding out the cause, and further management.
If a woman with moderate anaemia comes to you in labour, conduct the delivery at the PHC, but keep the following points in mind:
* Do not discharge her before 24 hours.
* Check the Hb level after 3 days.
* Give double the dose of iron (1 tablet of 100 mg twice a day) for 6 months postpartum.
Reassess the woman at the next postnatal visit (after 6 weeks). If there is no improvement, refer her to an FRU.

Severe anaemia
- Revise the birth plan to conduct the delivery in a facility with blood transfusion services.
- Give treatment similar to that mentioned above (see under "Moderate anaemia").
- Refer the woman to an FRU for further investigations and treatment. This woman might also need a blood transfusion.
- If a woman with severe anaemia comes to you in the early first stage of labour, or postpartum, refer her urgently to an FRU.
- If such a woman comes in the late first stage or second stage of labour:
  * Deliver the woman at the PHC.
  * Monitor the vital signs intensively during the delivery.
  * Try to minimize blood loss during delivery.
  * Refer her urgently to an FRU after delivery. Ensure that the woman is stable before you refer her.
- Follow up the woman in two weeks to check the clinical progress, test results and compliance with treatment of double dose of iron (1 tablet twice a day) for 6 months postpartum.

In case of moderate to severe anaemia, give 200 tablets of IFA during Ante-natal period.
(a) URINARY TRACT INFECTION

A urinary tract infection (UTI) in a pregnant/postpartum woman may be in the form of an upper UTI (acute pyelonephritis), or a lower UTI (cystitis). This woman needs treatment with antibiotics.

Signs and symptoms of UTI
- Fever, may be high grade, i.e. >38 °C; may be accompanied with chills and rigors
- Burning on urination
- Increased frequency and urgency of urination
- Abdominal pain
- Flank tenderness

Table 16: Diagnosis of fever and dysuria during pregnancy and labour

<table>
<thead>
<tr>
<th>Symptoms and signs typically present</th>
<th>Symptoms and signs sometimes present</th>
<th>Probable diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dysuria</td>
<td>Retropubic/suprapubic pain during or after urination</td>
<td>Cystitis</td>
</tr>
<tr>
<td>Increased frequency and urgency of urination</td>
<td>Abdominal pain</td>
<td></td>
</tr>
<tr>
<td>Dysuria</td>
<td>Retropubic/suprapublic pain</td>
<td>Acute pyelonephritis</td>
</tr>
<tr>
<td>Spiking fever/chills</td>
<td>Loin pain/tenderness</td>
<td></td>
</tr>
<tr>
<td>Increased frequency and urgency of urination</td>
<td>Tenderness in the rib cage</td>
<td></td>
</tr>
<tr>
<td>Abdominal pain</td>
<td>Anorexia</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nausea/vomiting</td>
<td></td>
</tr>
</tbody>
</table>

Investigations

Dipstick, microscopy and urine culture tests (if available at the PHC) can be used to determine if UTI is present, but it will not differentiate between cystitis and acute pyelonephritis.
- A dipstick leucocyte esterase test can be used to detect white blood cells, and a nitrate reductase test can be used to detect nitrates.
- Microscopy of the urine sample may show white cells in clumps, bacteria and, sometimes, red cells.
- Urine culture and sensitivity tests should be done, if available, to identify the organism and know its antibiotic sensitivity.

NOTE: Urine examination requires a clean-catch mid-stream sample to minimize the possibility of contamination.

Treatment

General management
- Encourage bed rest.
- Encourage increased fluid intake by mouth.
- Use a fan or tepid sponge to help decrease the body temperature.
Assume that a urinary tract infection involves all levels of the urinary tract, from the renal calyces to the urethral meatus.

Cystitis

- Treat with antibiotics
  * Cap. Amoxicillin, 500 mg orally, 3 times a day for 3 days; OR
  * Tab. Co-trimoxazole (160/800 mg) 1 tablet orally, 2 times a day for 3 days.
- If the woman responds, continue the antibiotics for 10-14 days.
- If there is no response, i.e., the treatment fails, refer the woman to an FRU for urine culture and sensitivity, and further management.
- If the infection recurs two or more times:
  * Refer to an FRU for urine culture and sensitivity tests;
  * For prophylaxis against further infections, give antibiotics orally once daily at bedtime for the remainder of the pregnancy and two weeks postpartum. Give:
    - Co-trimoxazole 1 tablet (160/800 mg) OR
    - Amoxicillin 250 mg

NOTE: Prophylaxis is indicated only after recurrent infections, and NOT after just a single episode.

Acute pyelonephritis

Acute pyelonephritis is an infection of the upper urinary tract, mainly of the renal pelvis, which may also involve the renal parenchyma.

- If shock is present or suspected, initiate immediate treatment [see Module 2, Chapter 9, "Management of shock"].
- Start an IV infusion and infuse IV fluids @ 150 ml per hour [see Annexure 14: "Inserting an IV line and giving IV fluids"].
- Start the woman on antibiotics and refer her to an FRU for further management. Give:
  * Ampicillin 2 g IV
  * PLUS Gentamicin 80 mg IM
- Give Paracetamol, 500 mg orally as needed to control the pain and lower the body temperature.
(B) HYPEREMESIS GRAVIDARUM

Definition
This condition occurs during pregnancy and is characterized by excessive vomiting and inability of the woman to retain anything taken orally, resulting in metabolic acidosis. It is more commonly seen in primigravidas, in women with multiple pregnancy and in the presence of a hydatidiform mole.

Diagnosis
On examination, you may find the following signs:
• Dehydration (dry tongue, loss of skin turgor, oliguria in severe cases)
• Tachycardia may be present
• Ketonuria may be present

Differential diagnosis
Exclude the following conditions, which may result in vomiting when present during pregnancy.
• Jaundice
• Meningitis
• Diabetic coma
• Uraemic coma
• Peritonitis due to untreated septic abortion.

Management
• Admit the woman to the PHC.
• Reassure the woman and her family. Counsel them regarding the harmless nature of the condition.
• Start IV fluids slowly, either R/L or dextrose saline.
• Repeat urine examination every four hours till it becomes negative for ketone bodies.
• Occasionally, an anti-emetic such as Inj. Stemetil may be required to control the vomiting.
• Once the vomiting stops and the dehydration is corrected, discharge after 24 hours.
• Advise the woman to take small, frequent, carbohydrate-rich meals.
(C) RETENTION OF URINE

During the late first trimester, dysuria may present due to pressure of the retroverted gravid uterus on the bladder, though usually this does not present with any symptoms. After 12 weeks of gestation, spontaneous correction of the retroversion occurs and the uterus rises above the pelvic brim and becomes palpable per abdomen. Occasionally, the uterus remains retroverted even after 12 weeks of gestation and retention of urine occurs due to stretching of the urethra.

Diagnosis

- On abdominal examination, a cystic swelling is palpable in the lower abdomen arising from the pelvis. The swelling may be large enough to reach above the umbilicus.
- On vaginal examination
  - The cervix is high up behind the symphysis pubis and directed downward and forward.
  - The uterus is retroverted, more than 12 weeks in size and is felt below the cervix.
  - There is a cystic mass in the anterior fornix.

Management

- Under all aseptic precautions, insert a self-retaining Foley catheter. Drain the urine continuously for 48 hours.
- These measures allow the uterus to rise above the pelvic brim.
- Once the uterus is palpable P/A, remove the catheter and ensure that the woman can pass urine on her own.
(D) PREMATURE OR PRELABOUR RUPTURE OF MEMBRANES

Definition
Premature or prelabour rupture of membranes (PROM) is rupture of the membranes (bag of waters) any time after 22 weeks of gestation but before the onset of labour.

Diagnosis
The diagnosis of PROM may not be difficult when the membranes have ruptured recently. In such cases, a profuse watery discharge with the typical odour of the amniotic fluid may be seen at the introitus on inspection. But when the leakage is gradual, diagnosis may be difficult.

The following signs and symptoms may be seen in PROM:

• A P/S examination done under aseptic conditions may reveal a pool of amniotic fluid lying in the vagina, or amniotic fluid coming out of the cervix, particularly when the woman is made to cough.
• A sterile pad placed over the vulva and examined after an hour may show the pad soaked with amniotic fluid.
• If the facilities are available, the following tests may also be carried out.
  * Nitrazine test: Normal vaginal secretions are acidic and the amniotic fluid is alkaline. Touching a nitrazine paper to the pool of fluid collected on a speculum from the vagina will change it from yellow to blue if the fluid is alkaline, indicating rupture of the membranes.
  * Ferning test: Amniotic fluid, when dried, crystallizes and leaves a fern-leaf pattern. Spread some fluid pooled in the vagina on a glass slide and let it dry. Examine under a microscope for ferning.

NOTE: · A digital examination (P/V) in no way helps to establish the diagnosis of PROM
  • Instead it may add to the complication by way of introducing infection.
  • If a woman complains of bleeding after 20 weeks of gestation, do NOT do a digital vaginal examination.
Table 17: Differential diagnosis of vaginal discharge during pregnancy

<table>
<thead>
<tr>
<th>Symptoms and signs typically present</th>
<th>Symptoms and signs sometimes present</th>
<th>Probable diagnosis</th>
</tr>
</thead>
</table>
| Watery vaginal discharge            | • Sudden gush or intermittent leaking of fluid  
• Fluid seen at the introitus  
• No contractions within 1 hour | PROM             |
| • Foul-smelling watery vaginal discharge after 22 weeks of gestation  
• Fever/chills  
• Abdominal pain | • History of loss of fluid  
• Tender uterus  
• Rapid foetal heart rate  
• Light vaginal bleeding | Amnionitis |
| • Foul-smelling vaginal discharge  
• No history of loss of fluid | • Itching  
• Frothy/curdish discharge  
• Abdominal pain  
• Dysuria | Vaginitis/cervicitis |
| Bloody vaginal discharge            | • Abdominal pain  
• Loss of foetal movements  
• Heavy, prolonged vaginal bleeding | Antepartum haemorrhage |
| Blood-stained mucus or watery vaginal discharge | • Cervical dilatation and effacement  
• Contractions | Possible labour  
(May be term or preterm) |

Management

• If there is vaginal bleeding with intermittent or constant abdominal pain, suspect abruptio placentae [see Module 2, Chapter 1 b: "APH-Haemorrhage during late pregnancy and labour"].

• If there are signs of infection (fever, foul-smelling vaginal discharge) give a combination of the triple antibiotics (Ampicillin, Metronidazole and Gentamicin) for amnionitis and refer the woman to an FRU for further management.

• If there are no signs of infection and the pregnancy is less than 37 weeks (when the foetal lungs are more likely to be immature)
  * The woman may be managed conservatively under strict supervision and strict monitoring for signs of development of chorioamnionitis. At the earliest sign of chorioamnionitis, the pregnancy needs to be terminated.
  * Termination is best done in an FRU where facilities are available to manage complications and provide care to a premature newborn.
  * Hence, it is best to refer these women to an FRU after administering the following
    - Give the first dose of the triple antibiotics to reduce morbidity caused by maternal and neonatal infection and to delay delivery, i.e. 1 g Ampicillin and 400 mg Metronidazole orally along with Inj. Gentamicin 80 mg IM.
    - Also give steroids to improve foetal lung maturity, i.e. either Inj. Betamethasone 12 mg IM, OR Inj. Dexamethasone 6 mg IM, and then refer the woman to an FRU.
Do NOT use corticosteroids in the presence of frank infection.

* If there are palpable contractions and a blood-stained mucus discharge, suspect preterm labour and manage accordingly [see Module 2, Chapter 7a: "Preterm labour"].

• If there are no signs of infection and the pregnancy is 37 weeks or more

* If the membranes have been ruptured for more than 18 hours, give prophylactic antibiotics, i.e. Ampicillin 1 g orally every 6 hours, Metronidazole 400 mg every 8 hours and Inj. Gentamicin 80 mg IM every 12 hours.

* Assess the cervix
  - If the cervix is favourable (soft, thin and partly dilated), this could signify the beginning of labour. Deliver the woman under antibiotic cover. If there are no signs of infection after delivery, discontinue the antibiotics.
  - If the cervix is unfavourable, refer the woman to an FRU for induction or a caesarean section as required, but after giving her the first dose of the triple antibiotics.
(A) PRETERM LABOUR

Definition
• Preterm labour refers to the onset of labour before 37 weeks of gestation.
• Preterm delivery is associated with a higher perinatal morbidity and mortality. Maternal problems in preterm labour are chiefly related to interventions carried out to stop contractions.

Management
Management of preterm labour consists of tocolysis (trying to stop the uterine contractions) or allowing the labour to progress.

Make every effort to confirm the gestational age of the foetus.

Tocolysis
• Attempt tocolysis if:
  * The period of gestation is <37 weeks.
  * The cervix is <3 cm dilated.
  * There is no amnionitis, pre-eclampsia or active bleeding.
  * There is no foetal distress.
• Confirm the diagnosis of preterm labour by documenting cervical effacement or dilatation over 2 hours.
• If the gestation period is <34 weeks, give corticosteroids to the mother to improve foetal lung maturity and the chances of survival of the newborn.
  * Betamethasone 12 mg IM, two doses, 24 hours apart
  * OR Dexamethasone 6 mg IM, four doses, 12 hours apart.
• Give a tocolytic drug and monitor the maternal and foetal condition (pulse, BP, signs of respiratory distress, uterine contractions, loss of amniotic fluid or blood, FHR, fluid balance, blood glucose, etc.)
• If the gestation period is <34 weeks, and labour continues despite tocolysis, or if the woman is already in an advanced stage of labour (cervical dilatation >3 cm) refer the woman immediately to an FRU.

NOTE: Do NOT give tocolytic drugs for more than 48 hours.

If preterm labour continues despite the use of tocolytic drugs, if possible, arrange to refer the woman to an FRU before she delivers. Otherwise, arrange for the baby to receive special care at an FRU with neonatal facilities.
Allowing labour to progress

- Allow labour to progress if
  * The period of gestation is >37 weeks.
  * The cervix is >3 cm dilated.
  * There is active bleeding.
  * The foetus is distressed, dead or has an anomaly incompatible with survival.
  * There is amnionitis or pre-eclampsia.
- Monitor the progress of labour using a partograph.
- If labour continues and the gestation period is <37 weeks.
  * Give prophylactic antibiotics to reduce the chances of infection in the neonate (Ampicillin, Metronidazole and Gentamicin).
  * Avoid delivery by MVA, as the risk of intracranial bleeding in a preterm baby is high.
- Prepare for management of preterm or LBW baby and anticipate the need for resuscitation.

<table>
<thead>
<tr>
<th>Drug</th>
<th>Initial dose</th>
<th>Subsequent dose</th>
<th>Side-effect and precautions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salbutamol</td>
<td>5 mg in 500 ml IV fluids. Start IV infusion @ 10 drops/minute</td>
<td>If contractions persist, increase the infusion rate by 10 drops/minute every 30 minutes until the contractions stop or the maternal pulse exceeds 120 beats/minute.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>If the contractions stop, maintain the same infusion rate for at least 8 hours after the last contraction.</td>
<td>If the maternal pulse increases (more than 120 beats/minute) reduce the infusion rate. If the woman is anaemic, use the drug with caution.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>If steroids and salbutamol are used, maternal pulmonary oedema may occur. Restrict fluids, maintain the fluid balance and stop the drug.</td>
</tr>
<tr>
<td>Indomethacin</td>
<td>100 mg loading dose via the mouth or rectum</td>
<td>Give 25 mg every 6 hours for 48 hours.</td>
<td>If the gestation period is more than 32 weeks, avoid use to prevent premature closure of the foetal ductus arteriosus. Do not use for more than 48 hours.</td>
</tr>
</tbody>
</table>
(b) FOETAL DISTRESS

Foetal distress is a manifestation of foetal hypoxia. If prolonged, it can lead to serious foetal damage including foetal death.

Diagnosis of foetal distress

During labour, foetal distress can be diagnosed by

- Abnormal FHR
- Thick, meconium-stained amniotic fluid

Box 11: Abnormal FHR

- A normal FHR is between 120 and 160 beats/minute.
- A slow FHR, i.e. <120 beats/minute (foetal bradycardia), in the absence of contractions, or if present persistently, is indicative of foetal distress.
- A normal FHR may slow down during a contraction, but usually recovers to normal as soon as the uterus relaxes. On the contrary, if there is a slowing down of the FHR during a contraction, which persists for a length of time thereafter (late deceleration pattern), it indicates foetal distress.
- A rapid FHR, i.e. >160 beats/minute (foetal tachycardia), may be a response to maternal tachycardia, which may be, in turn, a response to maternal fever, drugs such as terbutaline, ritodrine, etc. hypertension or amnionitis. In the absence of maternal tachycardia, a rapid FHR should be taken as a sign of foetal distress.

Box 12: Meconium staining of the amniotic fluid

- Meconium staining of the amniotic fluid is seen frequently as the foetus matures, and therefore by itself does not indicate foetal distress. A slight degree of meconium staining without heart rate abnormalities is a warning sign of the need for vigilance.
- Thick meconium staining along with FHR abnormalities suggests foetal distress.
- Thick meconium suggests the passage of meconium in a decreased volume of amniotic fluid, and may indicate the need for an expedited delivery and management of the neonatal upper airway at birth to prevent meconium aspiration.
- In a breech presentation, meconium is passed during labour due to compression of the foetal abdomen. This is not a sign of foetal distress unless it occurs in early labour.

Management of foetal distress

General management

This is aimed at improving the placental perfusion and foetal oxygenation.

- Prop up the woman or place her on her left side (left lateral position) to relieve aortocaval compression by improving the cardiac output and placental perfusion.
• Stop Oxytocin if it is being administered.
• Give oxygen 4-6 L through a mask or cannula.
• Rapidly infuse about 1 L of R/L to expand the intravascular volume provided there are no contraindications for such an infusion.

Specific management
• If a maternal cause for FHR abnormality is identified (maternal fever, drugs) initiate appropriate management.
• If a maternal cause is not identified, and the FHR remains abnormal throughout at least three contractions, perform a vaginal examination to check for any explanatory signs of distress, and manage accordingly.
  * If there is vaginal bleeding with intermittent or constant abdominal pain, suspect abruptio placentae and manage accordingly [see Module 2, Chapter 1b: "APH-Haemorrhage during late pregnancy and labour"].
  * If there are signs of infection (fever, foul-smelling vaginal discharge) suspect amnionitis and start the woman on antibiotics (Ampicillin, Gentamicin and Metronidazole).
  * If the cord is prolapsed below the presenting part, or in the vagina, manage appropriately [see Module 2, Chapter 7c: "Prolapsed cord"].

• If FHR abnormalities persist or there are additional signs of distress (thick, meconium-stained fluid), plan for delivery.
  * If the cervix is fully dilated and the foetal head is low down, expedite delivery by ventouse vacuum extraction [see Annexure 24: "Ventouse (vacuum extractor) delivery"] or forceps application [see Annexure 23: "Outlet forceps delivery"].
  * If the cervix is not fully dilated or delivery is not imminent (the foetal head is high), refer the woman to an FRU as a caesarean section may be required to save the baby.
(C) PROLAPSED CORD

Definition
A prolapsed cord is a condition in which the umbilical cord lies in the birth canal below the presenting part, with the foetal membranes ruptured. The same condition, but with the membranes intact, is known as a cord presentation. The cord may be visible at the introitus or lying outside it.

The immediate complication of cord prolapse is cord compression which can lead to foetal distress, and which can further lead to foetal death if immediate intervention is not carried out.

Cord prolapse is usually a result of improper fit of the presenting part over the pelvic brim, which is often due to foetopelvic disproportion or foetal malpresentation.

Management

General measures
Give the woman oxygen through a mask to improve foetal oxygenation.

Specific measures

• If the cord is not pulsating, the foetus is dead. Deliver in a manner that is safest for the woman. Allow labour to progress normally if there are no contraindications for a vaginal delivery.
• If the cord is pulsating, it means that the foetus is alive and has a reasonable chance of surviving after delivery.
  * Diagnose the stage of labour by an immediate vaginal examination
  * If the woman is in the first stage of labour
    - The cord compression can be relieved or lessened by dislodging the presenting part from the pelvis and keeping it like that till the baby is delivered by caesarean section.
    - One of the ways is to insert a hand into the vagina after wearing high-level disinfected or sterile gloves and push the presenting part up to decrease the pressure on the cord. Replace the cord back into the vagina
    - After doing this, place the other hand on the abdomen on the suprapubic region to keep the presenting part out of the pelvis.
    - Once the presenting part is held firmly above the pelvic brim, remove the other hand from the vagina. Keep the hand on the abdomen until caesarean section.
    - Another way to relieve the pressure is by introducing a Foley’s self-retaining catheter and distending the bladder with 500 ml of normal saline. Clamp the catheter. Release the clamp only when one is ready to extract the baby by a uterine incision during caesarean section.
    - In the second method, the distended bladder will also have a tocolytic (uterine relaxant) effect, thus decreasing the cord compression further.
    - Give Salbutamol 0.5 mg IV slowly over 2 minutes to reduce uterine contractions.
    - Refer the woman immediately to an FRU after these preliminary measures for a caesarean section.
- Do NOT try to replace the cord above the presenting part as this may cause constriction of the umbilical vessels resulting in more foetal distress. At best, the cord may be replaced in the vagina while the woman is transported to an FRU.

* If the woman is in the second stage of labour

- Expedite the delivery with an episiotomy [see Annexure 17: "Making and repairing an episiotomy"], and ventouse vacuum extraction [see Annexure 24: "Ventouse (vacuum extractor) delivery"] or outlet forceps application [see Annexure 23: "Outlet forceps delivery"].

- Be prepared to resuscitate the newborn [see Module 1, Chapter 4: "Essential newborn care and basic newborn resuscitation"].
(D) TWINS

Definition

When more than one foetus develops simultaneously in the uterus, it is called multiple pregnancy. Simultaneous development of two foetuses (twins) is the commonest; but rarely development of three foetuses (triplets), four foetuses (quadruplets), etc. may also occur. The cause of twinning and other multiple pregnancy is either hereditary or it may be due to multiple ovulation occurring either naturally or induced by drugs used for infertility treatment, or in an in vitro fertilization (IVF) programme.

Diagnosis

Early diagnosis and appropriate management will go a long way in preventing complications associated with twin pregnancy.

History

- H/o ovulation-inducing drugs, especially gonadotrophins and clomiphene for the management of infertility
- Family h/o twins
- Increased nausea and vomiting in the first trimester
- Breathlessness in the later months of pregnancy due to overdistension of the uterus.
- Unusual rate of abdominal enlargement and excessive foetal movements (as told by the woman)

Examination

- Unusual weight gain, not explained by pre-eclampsia or obesity
- Unduly enlarged, barrel-shaped abdomen
- The height of uterus is more than the period of amenorrhoea. This discrepancy may become evident only from mid-pregnancy onwards.
- The foetal bulk seems disproportionately larger in relation to the foetal head.
- Palpation of too many foetal parts, finding two foetal heads or three foetal poles makes the diagnosis almost certain.
- Auscultation for the FHS can help confirm the diagnosis. If two independent observers listening simultaneously hear two FHS distinctly in two different areas, well separated from each other, with the foetal hearts differing in frequency by at least 10 beats/minute, it is likely to be a twin pregnancy. However, it would be unwise to rely on auscultatory findings alone to make a diagnosis.
- Multiple pregnancy is associated with polyhydramnios in 12% of cases. The presence of polyhydramnios makes abdominal palpation and auscultation for FHS difficult.
- Diagnosis during labour: Occasionally the diagnosis of twins may be missed during pregnancy, and the presence of the second foetus may be discovered only during labour.

* The presence of one cephalic pole felt distinctly on vaginal examination and another pole at the fundus during abdominal palpation points towards the presence of twins.
* The size of the head (or the breech) on pelvic examination during labour may be smaller than expected from abdominal examination.

Complications associated with twinning

Antenatal complications
There are increased chances of the following in twin pregnancies:
- Hyperemesis gravidarum
- Mechanical distress
- Abortion
- APH
- Anaemia
- Pre-eclampsia
- Polyhydramnios
- IUGR
- IUD
- Congenital malformations

Intranatal complications
There are increased chances of the following:
- Malpresentation
- Preterm labour
- Prolonged labour
- APH following the birth of the first baby
- PPH

Postnatal complications
There are increased chances of the following:
- Subinvolution of the uterus
- Puerperal sepsis
- Problems in lactation

Management of twins

Antenatal management
- Keep the complications mentioned above in mind while providing ANC to a woman carrying twins.
- Once the diagnosis is made, provide routine ANC.
- Keep an eye for complications and, if they develop, manage them accordingly.
Management during labour

- If the woman diagnosed as having twins presents in the early first stage of labour, refer her immediately to an FRU for delivery.

- If the woman presents in late first stage or the second stage of labour, there may be no time for referral and you must conduct the delivery at the PHC.

- **Delivery of the first twin**
  * Give an adequate episiotomy under pudendal block [see Annexure 17: "Making and repairing an episiotomy"].
  * Conduct the delivery as usual.
  * Do not give an oxytocic after delivery of the first twin.
  * After delivery of the first twin, as is the usual practice even in singleton births, clamp the cord at two places and cut in between. This will prevent exsanguination of the second baby in case of uniovular twins.

- **Delivery of the second twin**
  * After delivery of the first baby, remove your gloves and do an abdominal examination to check the lie of the twin. Also check the FHS of the twin.
  * If the lie is longitudinal (vertex or breech), see if the membranes have ruptured. If yes, immediately carry out a vaginal examination. If not, do a vaginal examination after 5-10 minutes. Fix the presenting part and carry out an artificial rupture of the membranes.
  * If the contractions are not effective, add 2 U of Oxytocin to a bottle (500 ml) of R/L.
  * If there is excessive vaginal bleeding, foetal distress or cord prolapse, hasten the delivery by using a pair of forceps (in case of a vertex presentation) [see Annexure 23: "Outlet forceps delivery"] or a breech extraction (in case of breech presentation) [see Annexure 22: "Conducting a breech delivery"].
  * Otherwise conduct a normal vaginal or assisted breech delivery in the usual manner.
  * After the delivery of the second baby, clamp the cord promptly.
  * Carry out active management of the third stage of labour [see Module 1, Chapter 2: "Care during labour and delivery-intrapartum care"].
  * Add 10-20 U of Oxytocin to the R/L drip to prevent atonic PPH, which is more common in the case of twin deliveries.
  * If the lie of the second twin is transverse or oblique, refer the woman immediately to an FRU, as she will need a caesarean section. Start IV fluids before referral.
(A) UTERINE INVERSION

Acute inversion of the uterus is a rare condition. The inversion may be complete or incomplete. Acute inversion of the uterus is often followed by circulatory collapse that may be associated with neurogenic shock due to pull on the infundibulopelvic ligaments. The woman needs immediate management, as the condition can be fatal.

**Diagnosis**

**History**

- There may be a h/o pulling on the umbilical cord in the absence of a uterine contraction, during the third stage of labour, in an effort to deliver the placenta; OR
- There may be a h/o pulling on the cord in the presence of "placenta accreta" (i.e. an implantation of the placenta in which there is an abnormally firm adherence to the uterine wall); OR
- There may be a h/o excessive fundal pressure given on a relaxed uterus in an effort to deliver the baby or placenta.

**Examination**

- The woman may present in shock.
- The uterus may be contracted or relaxed, depending on whether the placenta has been delivered or not.
- The uterine fundus is seen outside the introitus, or in the vagina.

**Prevention**

- Do not pull on the cord in the absence of a uterine contraction.
- Always apply "counter-traction" with the other hand while carrying out CCT.
- Do not apply fundal pressure to deliver the baby or the placenta.

**Management**

Manage only those cases where the inversion has taken place a short while ago at your PHC.

All cases of uterine inversion brought from the community or after some delay should be referred to an FRU where the services of an obstetrician are available.

- Rapidly evaluate the woman’s condition.
- Examine her vital signs, i.e. pulse, BP and look for pallor, to assess for the presence of shock.
- Ask/look whether the placenta has been delivered or not.
- Take a written informed consent of the woman or any family member accompanying her, in case the woman is not in a position to give informed consent.
- Start IV fluids [see Annexure 14: "Inserting an IV line and giving IV fluids"], i.e. R/L to be infused fast.
Manual replacement of the uterus: Give the woman IV sedation with Inj. Pentazocine (Fortwin) 30 mg, and Inj. Phenergan 25 mg.

* Ensure aseptic precautions, i.e. wear sterile gloves, and clean the area with antiseptic swabs.
* Insert a hand into the vagina. Feel for the cervical rim.
* Repose the uterus back, starting with the part that comes out last. (Remember, during inversion, the fundus comes out first and the portion of the uterus just above the cervix comes out last.) Thus, the part of the uterus just above the cervix is reposed first, gradually going up.
* Usually after a certain point, the fundus moves up on its own.

If the placenta is not separated even after the procedure, remove the placenta manually [see Annexure 20: "Procedure for manual removal of placenta"]: Do not remove the placenta, if retained, before vaginal replacement of the uterus as it can lead to severe haemorrhage.

* Give an oxytocic drug (Oxytocin or Misoprostol) before removing the hand from the vagina. Add 20 U of Oxytocin to the IV drip.
* Monitor the pulse, BP and uterine fundal height every 15 minutes for the next 2 hours, every hour for the next 4 hours and the every 6 hours for the next 24 hours.
* If inversion of the uterus recurs, refer the woman to an FRU.
* Start the woman on antibiotics, i.e. Cap. Ampicillin, 500 mg 8-hourly, Tab. Metronidazole 400 mg 8-hourly, and Inj. Gentamicin 80 mg IM, every 12 hours.
(b) BREAST PROBLEMS: MASTITIS AND BREAST ABSCESS

Sore and fissured nipples, breast engorgement, mastitis and breast abscess are painful conditions of the breast commonly seen in a woman during the postpartum period. Hence, breast examination should be an essential part of routine postpartum examination of the mother.

Diagnosis

To diagnose conditions affecting the breasts, examine the woman for the following:

- Measure the body temperature of the woman.
- Look at the nipples for fissuring.
- Look at the breasts for:
  - swelling
  - shiny skin
  - redness
- Palpate the breasts for any tenderness.
- Observe the woman during a breastfeed, if you have not yet done so.

Table 19: Diagnosing breast problems during the postpartum period

<table>
<thead>
<tr>
<th>Symptoms and signs typically present</th>
<th>Symptoms and signs sometimes present</th>
<th>Probable diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nipple sore or fissured</td>
<td>Hard and enlarged breasts</td>
<td>Nipple soreness or fissure</td>
</tr>
<tr>
<td>The baby is not attached well</td>
<td>Breasts are shiny and patchily red</td>
<td>Breast engorgement</td>
</tr>
<tr>
<td></td>
<td>Both the breasts are affected</td>
<td></td>
</tr>
<tr>
<td>Breast pain and tenderness</td>
<td>Inflammation preceded by engorgement</td>
<td>Mastitis</td>
</tr>
<tr>
<td>Occurs 3-5 days after delivery</td>
<td>Usually only one breast is affected</td>
<td></td>
</tr>
<tr>
<td>Temperature is &lt;38 ºC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The baby is not attached well</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reddened, wedge-shaped area on the breast</td>
<td></td>
<td>Mastitis</td>
</tr>
<tr>
<td>Occurs 3-4 weeks after delivery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Firm, acutely tender breast</td>
<td>Fluctuant swelling in the breast</td>
<td>Breast abscess</td>
</tr>
<tr>
<td>Overlying erythema</td>
<td>Draining pus</td>
<td></td>
</tr>
</tbody>
</table>

Treatment

Nipple soreness or fissure

- Encourage the mother to continue breastfeeding.
- Teach her the correct position and how the baby should be attached to the breast.
Attachment of the baby to the breast

- Reassess after two feeds or after one day. If it is still not better, teach the mother how to express breast milk from the affected breast and feed the baby by cup, and continue breastfeeding on the healthy side.

Breast engorgement

Breast engorgement is an exaggeration of the lymphatic and venous engorgement that occurs before lactation. It is not the result of overdistension of the breast with milk.

- If the woman is breastfeeding and the baby is not able to suckle, encourage the woman to express milk by hand or with a pump.
- If the woman is breastfeeding and the baby is able to suckle
  * Encourage the woman to breastfeed more frequently, using both breasts at each feeding.
  * Show the woman how to hold the baby and help it attach (proper positioning and attachment).
  * Relief measures before feeding include:
    - Apply warm compresses to the breasts just before breastfeeding, or encourage the woman to take a warm shower.
    - Massage the woman’s back and neck.
    - Have the woman express some milk manually before breastfeeding and wet the nipple area to help the baby latch on properly and easily.
  * Relief measures after feeding may include:
    - Support the breasts with a binder or brassiere.
    - Apply cold compresses to the breasts between feeds to reduce the swelling and pain.
    - Give Paracetamol 500 mg orally as needed.
  * Follow up in 3 days to ensure response.

- If the woman is not breastfeeding (say, for example, due to separation from the child, or death of the child)
  * Support the breasts with a binder or a brassiere.
  * Apply cold compresses to the breasts to reduce the swelling and pain.
* When the breasts are tender and full, express just enough to give the woman relief. Do NOT empty the breasts fully. This will help suppress lactation gradually.
* Avoid massaging or applying heat to the breasts.
* Avoid stimulating the nipples.
* Give Paracetamol 500 mg orally as needed.
* Follow up in 3 days to ensure response.

*Mastitis*

- Treat with antibiotics:
  * Cap. Ampicillin 500 mg orally three times a day for 10 days; if there is no improvement after 72 hours, change to another antibiotic.
  * OR Erythromycin 250 mg orally three times a day for 10 days.

- Encourage the woman to:
  * Continue breastfeeding.
  * Support the breasts with a binder or a brassiere.
  * Apply cold compresses to the breasts between feeds to reduce the swelling and pain.

- Give Paracetamol 500 mg orally.
- Follow up in 3 days to ensure response.

*Breast abscess*

- Treat with antibiotics:
  * Cap. Ampicillin 500 mg orally three times a day for 10 days; if there is no improvement after 72 hours, change to another antibiotic.
  * OR Erythromycin 250 mg orally three times a day for 10 days.

- Draining the abscess: Since anaesthesia is required for draining a deep abscess, refer the woman to an FRU.

- Encourage the woman to:
  * Continue breastfeeding even when there is a collection of pus.
  * Support the breasts with a binder or brassiere.
  * Apply cold compresses to the breasts between feeds to reduce the swelling and pain.

- Give Paracetamol 500 mg orally as needed.
- Follow up in 3 days to ensure response.
**Introduction**

Shock is a life-threatening condition and requires immediate and intensive treatment to save the patient's life. With shock, the oxygen supply and blood flow to the tissues is interrupted due to a generalized and severe failure of the circulatory system. Based on the cause, shock can be categorized into the following types:

- **Haemorrhagic/hypovolaemic shock** (due to haemorrhage, as in APH, PPH or ruptured uterus)
- **Septic shock** (due to severe and extensive puerperal sepsis, or septicaemia following puerperal sepsis)
- **Neurogenic shock** (seen in cases of inverted or ruptured uterus).

**Table 20: Diagnosis and management of various types of shock**

<table>
<thead>
<tr>
<th>Type of shock</th>
<th>Signs and symptoms</th>
<th>Management</th>
</tr>
</thead>
</table>
| Hypovolaemic shock  | • Low-volume pulse  
                     | • Tachycardia  
                     | • Low BP  
                     | • Cold and clammy extremities | • Since it is usually due to haemorrhage, stop the bleeding  
                     |                                    | • Start IV fluids with Ringer lactate (R/L); to be infused fast  
                     |                                    | • If blood transfusion is required, refer the woman to an FRU |
| Septic shock        | • Full and bounding pulse  
                     | • Tachycardia  
                     | • Low BP  
                     | • Flushed face  
                     | • Warm extremities | • Start an IV line with R/L  
                     |                                    | • Start broad-spectrum antibiotics  
                     |                                    | • Give a single dose of corticosteroids (Inj. hydrocortisone, 100 mg, IM or IV)  
                     |                                    | • Refer the woman to an FRU |
| Neurogenic shock    | • Try and correct the cause of shock  
                     |                                    | • Start an IV line. The rate of infusion of fluids will depend upon the cause.  
                     |                                    | • If the cause cannot be treated, refer the woman to an FRU |

When the patient is in shock, the relative volume of blood circulating is reduced either through loss of blood (haemorrhage) or through dilatation of the blood vessels (vasodilatation) due to sepsis. In both cases, the amount of blood and fluids circulating must be increased. Shock can progress from early "mild" to late "severe" and, if not treated, the patient may die.

Patients suffering from shock must be treated promptly and watched closely as their condition can worsen rapidly. The primary goal in treating shock is to stabilize the patient, i.e. to restore the volume and efficiency of the circulatory system. Start life-saving care immediately, with IV fluids for volume replacement. Give antibiotics immediately if sepsis or an intra-abdominal injury is also present. First referral-level hospitals should be able to manage most cases of shock. In facilities where shock cannot be treated, initial measures or care should be given [see under "Universal measures" later in this chapter].

While treating shock is essential to save the woman's life, the underlying cause must also be treated immediately to keep the condition of the patient from getting worse. Haemorrhage should be arrested. In cases of renal failure or where the woman's condition does not stabilize, transport her rapidly to a higher health facility.

When the patient is first seen with complications of abortion, assess her immediately for signs of shock. If haemorrhage, trauma or sepsis are immediately apparent, the possibility of shock should also be considered.
Signs of shock

* Fast, weak pulse rate (rate 110 beats/minute or greater)
* Low BP (hypotension); systolic <90 mmHg, diastolic <60 mmHg
* Pallor (inner eyelid [conjunctival]), around the mouth, or palms
* Sweating
* Rapid breathing (RR 30 breaths/minute or more) in severe shock, air hunger due to hypoxia
* Anxious, confused, or unconscious (diminished mental state)
* Scanty urine output; less than 30 ml per hour

Assessment of shock

When shock is suspected, assess its stage and severity immediately. Early shock is reversible and may respond well to the treatment generally available at the primary level. If early shock is not recognized and not treated, it will progress to late shock. Late shock is more difficult to treat with the facilities typically available at PHCs and requires referral for more intensive care once emergency care has been started. Table 21 compares the signs of early and late shock.

Table 21: Signs of early and late shock

<table>
<thead>
<tr>
<th>Early shock</th>
<th>Late shock</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Awake, aware, anxious</td>
<td>• Confused or unconscious</td>
</tr>
<tr>
<td>• Slightly fast pulse (110 beats/minute or greater)</td>
<td>• Very fast and weak pulse (even pulseless)</td>
</tr>
<tr>
<td>• Slightly fast breathing (30 breaths/minute or more)</td>
<td>• Extremely fast and shallow breathing</td>
</tr>
<tr>
<td>• Pale</td>
<td>• Pale and cold</td>
</tr>
<tr>
<td>• Mild fall in blood pressure (BP) (systolic &lt;90 mmHg)</td>
<td>• Very low BP (sometimes unrecordable)</td>
</tr>
<tr>
<td>• Lungs clear</td>
<td>• Heart failure, pulmonary oedema</td>
</tr>
<tr>
<td>• Haemoglobin level 8 g/100 ml or more</td>
<td>• Haemoglobin level &lt;8 g/100 ml</td>
</tr>
<tr>
<td>• Urine output 30 cc per hour or more</td>
<td>• Urine output &lt;30 cc per hour</td>
</tr>
</tbody>
</table>

Initial treatment

The first steps in the care of shock can be life-saving.

Universal measures

Check the vital signs (pulse, BP and temperature). Do NOT give fluids by mouth as the woman may vomit and inhale (aspirate) the vomit. Turn the woman’s head and body to the side so that if she vomits, she is less likely to aspirate. Keep her warm because hypothermia is a danger (it can worsen the shock). Blankets are useful, but do NOT apply any external sources of heat (heating pad, hot water bottle) as a person in shock may easily be burnt. Raise the legs to help the blood return to the heart and, if possible, raise the foot end of the bed.

If lying down causes severe difficulty in breathing, there may be heart failure and pulmonary oedema. In this case, lower the legs and raise the head to relieve the fluid pressure on the lungs.
Oxygen

Make sure that the airway is open. If oxygen is available, start oxygen at 6-8 L/minute using a mask or nasal cannula.

Fluids

IV fluids: Do NOT give fluids by mouth. To restore the fluid volume, start IV fluids immediately [see Annexure 14: "Inserting an IV line and giving IV fluids"]). Infuse a compound solution of sodium lactate or normal saline (sodium chloride) @ 1 L in 15-20 minutes. Normally, it takes 1-3 L of IV fluids infused at this rate to stabilize the patient in shock. It is important to monitor the amount of fluids given.

In case the Hb level is 5 g/100 ml or the haematocrit is 15% or less, the condition is life-threatening and the woman needs to be referred immediately for blood transfusion. Both clinical and laboratory findings should be taken into consideration to decide whether the patient needs referral.

Medicines

IV or IM ONLY (IV preferred). DO NOT give any medicines by mouth to a woman in shock.

Antibiotics: If there are any indications that infection may be present, including fever, chills or pus, give broad-spectrum antibiotics effective against Gram-negative, Gram-positive, anaerobic organisms and Chlamydia.

The preferred antibiotic combinations are:

* Inj. Ampicillin 500 mg I/V and then 6-hourly
* Gentamicin 80 mg I/V 12-hourly
* Metronidazole 500 mg I/V 8-hourly

Measures to improve the urinary output

Little or no urine output is a sign of low blood volume seen in shock, haemorrhage and dehydration, and can be a sign of kidney failure. Measure the urine output, preferably by inserting a Foley’s self-retaining catheter. If catheterization is not possible, collect and measure the urine output. If it is not possible to collect the urine, note if the urine is concentrated (dark in colour), or if the output is decreased (little or no urination). If the output is initially low but begins to increase later, it indicates that the woman’s general condition is improving and is a measure of her response to IV fluids.

Additional measures

If a vaginal examination has not already been performed, check for and remove any products of conception present in the vagina.

Once the initial steps have been taken to stabilize the patient, prompt treatment of the underlying cause of shock is necessary, while continuing to closely monitor the patient’s condition. Retained products of conception are often the underlying cause of shock. Removal through uterine evacuation is therefore an essential part of definitive management and should be done as soon as possible, once the stabilizing steps have been taken and management of any other severe condition has been started. If the underlying cause of shock cannot be treated at the site, provide supportive treatment according to the guidelines below and refer the woman to a facility where treatment is available.
Assess the woman’s response to fluids within 20-30 minutes to see if her condition is stabilizing. The **signs of stabilization/improvement** include:

- An increase in the BP; aim for a systolic BP of 100 mmHg
- Slowing of the pulse rate (under 90 beats/minute)
- Improvement in the mental status (less confusion or anxiety)
- Increase in the urinary output; aim for a urine output of at least 100 ml per 4 hours
- The respiration should not be rapid and shallow.

**Failure to stabilize:** If after 20-30 minutes, the woman does not stabilize, continue efforts to stabilize her and assess her condition according to the following list:

- Continue oxygen and IV fluids.
- Monitor her condition closely.
- Reassess the need for antibiotics.
- Perform a complete clinical assessment.
- Diagnose and promptly begin treatment of the underlying cause or causes of shock.
- If definitive management of the underlying cause (including IV fluids for volume replacement) is not available, refer the patient.

As the time factor is very important in shock, if there is no improvement in 30 minutes of initial treatment, try to refer the patient at the earliest to a higher centre.

**Stabilization:** Even if the woman shows signs of improvement, address the underlying cause of shock as follows:

- Adjust the rate of IV fluids and oxygen as recommended below.
- Perform a complete clinical assessment.
- Begin treatment of the underlying cause or causes of shock. If definitive management (including uterine evacuation) is not available, refer the patient.

If oxygen is available, continue giving it to the woman till her condition becomes stable. If possible, continue oxygen during transportation if her condition remains unstable. As the woman stabilizes, oxygen can be gradually withdrawn. However, if her condition begins to worsen with the oxygen turned down or off, turn the oxygen back on @ 6-8 L/minute. Once her condition has stabilized and her low fluid volume has been corrected, give IV fluids @ 1 L in 6-8 hours.
MODULE 3
Ensuring the Quality of Care

Introduction
This module is meant to sensitize you to the fact that good clinical knowledge and skills, though important, are not sufficient to ensure client/patient satisfaction. Often, patients do not access the services of the primary health centre (PHC) due to the indifferent and unfriendly attitude of the health care staff. Your behaviour with patients is an important factor that will draw patients to your PHC. The quality of services offered at the PHC will also help maintain clientele. A strong focus on addressing clients’ perspectives on service quality issues will go a long way in enhancing service utilization and improving client satisfaction.

The first chapter in this module deals with issues such as the clients’ rights and other client-centred issues that are important for delivering quality services. The second chapter deals with the various methods, techniques and precautions that need to be followed to prevent infection in both patients and health care professionals.
Pregnancy is considered to be a physiological event and is typically a time of joy and anticipation. Any complication or risk of a "not normal" pregnancy shatters the dreams of the woman and her family. Invariably, one comes across instances where family members resort to blaming health providers for adverse outcomes, which leads to unpleasant situations. An increasing trend for initiating legal cases against service providers has also been noticed.

All health care providers at facilities that cater to maternity services should:
* Respect women's dignity and their right to privacy.
* Be sensitive and responsive to a woman's needs.
* Be non-judgemental about the decisions that the woman and her family take regarding her care. You may need to provide corrective counselling after the complication has been dealt with and not before or during the management of problems.
* Respect the rights of women who receive maternity care services.

Rights of women

Providers should also be aware of the rights of women when they receive maternity care services:
* Every woman receiving care has a right to information about her health.
* Every woman has the right to discuss her concerns in an environment in which she feels confident.
* A woman should know in advance the type of procedure that will be performed.
* Procedures should be conducted in an environment (e.g. labour ward) in which the woman's right to privacy is respected.
* The woman has a right to express her views about the service she receives.

When a provider talks to a woman about her pregnancy or a complication, basic communication techniques should be used. These techniques help the provider establish an honest, caring and trusting relationship with the woman. If a woman trusts the provider and feels that he/she has the best interests of the woman at heart, she will be more likely to return to the facility for delivery, or come early if there is a complication. In fact, she will also share her experience with other women in the community, who might be encouraged to use the services.

Emotional and psychological reactions in the event of an emergency during pregnancy/delivery

How each member of the family reacts to an emergency situation depends on
* The social situation of the woman/couple and their cultural and religious practices, beliefs and expectations
* The personalities of the people involved and the quality and nature of social, practical and emotional support
* The nature, gravity and prognosis of the problem, and the availability and quality of the health care services.

Common reactions to obstetric emergencies or death include
* Denial (feelings of "it can't be true")
* Guilt regarding possible responsibility
* Anger (frequently directed towards the health care staff but often masking the anger that patients direct at themselves for "failure")
* Bargaining (particularly if the patient hovers for a while between life and death)
* Depression and loss of self-esteem, which may be long-lasting
* Isolation (feeling of being different or separate from others that may be reinforced by providers who may avoid people who experience loss)
* Disorientation.

**General principles of communication and support**

While each emergency situation is unique, the following general principles offer guidance. Communication and genuine empathy are probably the most important keys to effective care in such situations.

**At the time of the event**

- Listen to those who are distressed. The family/mother will need to discuss their grief and sorrow.
- Do not change the subject and move on to easier or less painful topics of conversation. Show empathy.
- Tell the family/mother as much as you can about what is happening. Understanding the situation and its management can reduce their anxiety and prepare them for what comes next.
- Be honest. Do not hesitate to admit what you do not know. Maintaining trust matters more than appearing knowledgeable.
- If language/dialect is a barrier to communication, someone can be identified to translate for you.
- Do not pass the problem onto the nursing staff.
- Ensure that the woman has a companion of her choice and, where possible, the same caregiver throughout labour and delivery. Supportive companionship can enable a woman to face fear and pain, and reduce loneliness and distress.
- Where possible, encourage companions to take an active role in care. Position the companion at the top of the bed to allow them to focus on caring for the woman's emotional needs.
- Both during and after the event, provide as much privacy as possible for the woman and her family.

**After the event**

- Give practical assistance, information and emotional support.
- Respect traditional beliefs and customs and accommodate the family's needs as far as possible.
- Counsel the family/mother and allow for reflection on the event.
- Explain the problem to help reduce anxiety and guilt. Many families/mothers blame themselves for what has happened.
- Listen and express understanding and acceptance of the woman's feelings. Non-verbal communication may speak louder than words: a squeeze of the hand or a look of concern can say an enormous amount.
- Repeat the information several times and give written information, if possible. People experiencing an emergency will not remember much of what they are told.
- Health care providers may feel anger, guilt, sorrow, pain and frustration in the face of obstetric emergencies that may lead them to avoid the family/woman. Showing emotion is not a weakness.
- Remember to care for the staff who themselves may experience guilt, grief, confusion and other emotions.
This chapter outlines the basic principles of prevention and control of infections that may be acquired in health care facilities. The major objectives of infection prevention are to prevent infections when providing services and minimize the risk of transmitting infections, e.g. hepatitis B, C and HIV to clients and staff, including the cleaning and housekeeping staff. Almost all cases of hepatitis B and HIV due to transmission of infection to health care workers have occurred through preventable accidents, such as puncture wounds.

Sources of infection

In hospitals, the sources of infection may be service delivery personnel, patients or the environment. The source of an outbreak of nosocomial infection may be a health staff member who is infected or colonized (carrier). A typical example is *Staphylococcus aureus*, which may be carried in the nasal passage of 30%-60% of staff. Streptococcus, hepatitis B and HIV are other examples. The source of most hospital infections could be infected patients.

Why infection prevention?

With appropriate infection prevention practices, you can:

- Prevent post-procedure infection, including surgical-site infections, i.e. stitch abscess
- Prevent infections in service providers and other housekeeping staff
- Protect the community from infections that originate in health care facilities
- Prevent the spread of antibiotic-resistant microorganisms
- Lower the costs of health care, since prevention is cheaper.

The following are the recommended principles for infection prevention:

- All objects that come in contact with the patient should be considered as potentially contaminated.
- Every person (patient/staff) must be considered potentially infectious.
- If an object is disposable, it should be discarded as waste. If it is reusable, transmission of infective agents must be prevented by cleaning, disinfecting or sterilizing.

Standard precautions

Standard precautions should be followed with every patient regardless of whether or not you think the patient might have an infection. This is important because it is not possible to tell who is infected with viruses such as HIV and the hepatitis viruses, and often the infected persons themselves do not know that they are infected.

1. Handwashing

- Wash your hands after touching blood, secretions, excretions and contaminated items, whether or not gloves are worn. Wash your hands immediately after you remove your gloves and between patient contacts.
- Use plain soap for routine handwashing.
Module-3, Chapter-2

Procedure for handwashing

• Use an antimicrobial agent for specific circumstances.
• Do not use shared towels to dry your hands.
• For surgical procedures, wash your hands for 3-5 minutes, rinse each arm separately and ensure that the scrubbed hands do not come in contact with other objects that are not high-level disinfected or sterile. If the hands touch a contaminated surface repeat surgical scrubbing.

2. Gloves

• Wear gloves while touching blood, body fluids, secretions, excretions and contaminated items. Put on clean gloves just before touching the mucous membranes and non-intact skin.
• A separate pair of gloves should be used for each woman to avoid cross-contamination.
• Although disposable gloves are preferred, when resources are limited surgical gloves can be reused provided they have been:
  - decontaminated by soaking in 0.5% chlorine solution for 10 minutes
  - washed and rinsed
  - sterilized by autoclaving or high-level disinfection (HLD) by steaming or boiling
• Do not use gloves that are cracked, peeling or have detectable holes and tears.
• Clean, but not necessary sterile, gloves should be worn during all delivery procedures [see Annexure 7: Preparing "clean" gloves].

3. Mask, eye protection, face shield

Wear a mask and use eye protection or a face shield during procedures and patient care activities that are likely to generate splashing or spraying of blood, body fluids, secretions and excretions.
4. Gown
Wear a gown during procedures and patient care activities that are likely to generate splashing or spraying of blood, body fluids, secretions or excretions. A clean but not necessarily sterile gown should be used for all delivery procedures.

5. Patient care equipment
Ensure that reusable equipment is not used for the care of another patient until it has been cleaned and reprocessed appropriately.

6. Environmental control
Ensure that the hospital has adequate procedures for routine care, cleaning and disinfection of environmental surfaces.

7. Linen
Handle used linen soiled with blood, body fluids, secretions and excretions in a manner that prevents exposure to the skin and mucous membrane, and avoids transfer of microorganisms to other patients and the environment.

8. Occupational health and blood-borne pathogens
• Take care to prevent injuries while using needles, scalpels and other sharp instruments or devices.
• Use ventilation devices as an alternative to mouth-to-mouth resuscitation methods.

Hand hygiene
Handwashing and hand disinfection are the primary preventive measures.

<table>
<thead>
<tr>
<th>Table 22 : The main forms of hand hygiene</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technique</td>
</tr>
<tr>
<td>-------------------------------------</td>
</tr>
<tr>
<td>Social handwashing</td>
</tr>
<tr>
<td>Careful handwashing</td>
</tr>
<tr>
<td>Hygienic hand disinfection</td>
</tr>
<tr>
<td>Surgical hand disinfection</td>
</tr>
</tbody>
</table>
Handling sharp instruments and needles

Labour ward
• Do not leave sharp instruments or needles ("sharps") in places other than "safe zones".
• Before passing sharps to other workers, inform them that you are doing so, so that they are careful.

Hypodermic needles and syringes
• Use each needle and syringe ONLY ONCE.
• Do not disassemble the needle and syringe after use.
• Do not recap, bend or break needles before disposal.
• Dispose of needles and syringes in a puncture-proof container.
• Make hypodermic needles unusable by burning them.

NOTE: Where disposable needles are not available and recapping is practised, use the "one-handed" recap method:
• Place the cap on a hard, flat surface.
• Hold the syringe with one hand and use the needle to "scoop up" the cap.
• When the cap covers the needle completely, hold the base of the needle and use the other hand to secure the cap.

Waste disposal
There are specific concerns regarding infections due to the hepatitis B and HIV viruses, for which there is evidence of transmission via health care waste. These viruses can be transmitted through injuries from needles contaminated by human blood.

The purpose of waste disposal is:
- to prevent the spread of infection to hospital personnel who handle the waste
- to prevent the spread of infection to the local community and
- to protect those who handle waste from accidental injury.

Non-contaminated waste (e.g. paper, boxes) poses no risk for infection and can be disposed of according to local guidelines.

Proper handling of contaminated waste (blood or body fluid-contaminated items) is required to minimize the spread of infection to hospital personnel and the community.

Proper handling means:
• Wearing utility gloves
• Transporting solid contaminated waste to the disposal site in covered containers
• Disposing of all sharp items in puncture-resistant containers
• Carefully pouring liquid waste down a drain or flushable toilet
• Burning or burying contaminated solid waste
• Washing hands, gloves and containers after disposal of infectious waste.

### Table 23: Effectiveness of methods used for processing instruments

<table>
<thead>
<tr>
<th>Method</th>
<th>Effectiveness (removal or inactivation of microbes)</th>
<th>End-point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decontamination</td>
<td>Kills HBV and HIV</td>
<td>Soak for 10 minutes</td>
</tr>
<tr>
<td>Cleaning (water only)</td>
<td>Up to 50%</td>
<td>Until visibly clean</td>
</tr>
<tr>
<td>Cleaning (detergent with rinsing water)</td>
<td>Up to 80%</td>
<td>Until visibly clean</td>
</tr>
<tr>
<td>Sterilization</td>
<td>100%</td>
<td>Autoclave, dry heat or treat with chemicals for the recommended time</td>
</tr>
<tr>
<td>High-level disinfection(^a)</td>
<td>95% (does not inactivate some endospores)</td>
<td>Boil or treat with chemicals for 20 minutes</td>
</tr>
</tbody>
</table>

\(^a\)Thorough cleaning is required before decontamination.

### Decontamination

**Principles**

The first step in processing instruments and other items for reuse - decontamination - kills viruses (such as hepatitis B, other hepatitis viruses and HIV) and many other microorganisms, making these items safer to handle by the staff who do cleaning and further processing. Although decontamination also makes items easier to clean by preventing blood, other body fluids and tissue from drying on them, decontamination does not remove fluids, tissue or dirt. It makes items safer for handling.

**Practices**

- Place instruments and reusable surgical gloves in 0.5% chlorine solution after use.
- Soak for 10 minutes and rinse immediately.
- Wipe surfaces (examination tables) with chlorine solution.

### Cleaning

**Principles**

Cleaning refers to scrubbing with a brush, detergent and water to remove blood, other body fluids, organic material, tissue and dirt. Cleaning greatly reduces the number of microorganisms (including bacterial endospores) and is a crucial step in processing. If items have not been cleaned first, further processing might not be effective because microorganisms trapped in organic material may be protected and survive further processing. Organic material and dirt can make the chemicals used in some processing techniques less effective.
Practices
- Wash with soap solution and water.
- Scrub instruments to remove debris.
- Rinse thoroughly with clean water.

Sterilization

Principles
Sterilization eliminates all microorganisms (bacteria, viruses, fungi and parasites), including bacterial endospores from instruments and other items. Sterilization should be performed on any item that will come in contact with the bloodstream or tissues under the skin, as well as on drapes and some surgical attire. Sterilization can be performed using steam (autoclaving), dry heat or chemicals.

Practices
Steam sterilization
- 121 ºC; 15 lb/square inch pressure
- 20 minutes for unwrapped items, 30 minutes if wrapped
- Allow all the items to dry before removing.

Chemical sterilization
- Soak items either in glutaraldehyde for 8-10 hours or in formaldehyde for 24 hours.
- Rinse with sterile water.
- Store in a sterile container.

High-level disinfection

Principles
HLD is the process that eliminates all microorganisms (including bacteria, viruses, fungi and parasites), but does not reliably kill all bacterial endospores, which cause diseases such as tetanus and gas gangrene. This method is suitable for instruments and items that come in contact with broken skin or intact mucous membranes. If sterilization is not available, HLD is the only acceptable alternative. It can be performed by boiling, using chemicals or steaming. Sterilization is preferred to HLD for items that will come in contact with the bloodstream or tissues under the skin. In settings where tetanus is common, all attempts should be made to sterilize these items.

Practices
- Boil instruments and gloves for 20 minutes, or
- Soak in a high-level disinfectant
Table 24: High-level disinfectants and sterilants

<table>
<thead>
<tr>
<th>Disinfectants</th>
<th>Sterilization</th>
<th>HLD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glutaraldehyde</td>
<td>8-10 hours</td>
<td>20 minutes</td>
</tr>
<tr>
<td>Formaldehyde (8%) (formalin)</td>
<td>24 hours</td>
<td>20 minutes</td>
</tr>
<tr>
<td>Hydrogen peroxide (6%)</td>
<td>N/A</td>
<td>30 minutes</td>
</tr>
<tr>
<td>Chlorine (0.1% made with boiled water)</td>
<td>N/A</td>
<td>20 minutes</td>
</tr>
</tbody>
</table>

**NOTE:** Iodophors and alcohols cannot be used for sterilization or HLD.

*Preparing a high-level disinfected container*

- Boil (if small) or fill a clean container with 0.1% chlorine solution (made with boiled water).
- Soak for 20 minutes.
- Pour out the solution. (The chlorine solution can then be transferred to a plastic container and reused.)
- Rinse thoroughly with boiled water.
- Air dry before use.
ANNEXURE
Annexure-1
MEASURING THE BLOOD PRESSURE

The auscultatory method: Use this method at the primary health centre (PHC) as it measures both the systolic and the diastolic blood pressure (BP) levels.

- Ask the patient to sit or lie down comfortably and relax. If the woman has come walking, let her rest for 5-10 minutes before taking her BP.
- The woman should be tilted to her left side supported by a cushion placed at her back.
- Place the sphygmomanometer on a flat surface, level with the woman's heart.
- Ensure that the pointer on the dial is at zero. If not, adjust it by rotating the knob attached to the dial.
- Fix the inflatable cuff on the upper part of either arm after removing all clothing from that arm. The lower border of the cuff should not be more than 2.5 cm away from the cubital fossa (elbow).
- Place the dial/manometer at the same level as your eye.
- Feel for the brachial artery over the cubital fossa, just medial to the biceps tendon. Alternatively, feel for the pulse at the wrist of the arm to which the cuff is tied with your left hand.
- Tighten the screw of the rubber bulb and inflate the cuff by repeatedly pressing the bulb with your right hand.
- The pointer of the dial will show increasing deflections above zero as the pressure increases within the cuff.
- Keep on inflating the cuff and increasing the pressure by pressing the rubber bulb till you do not feel the pulse.
- Note the manometer reading. Increase the pressure by 10 mmHg above the level at which the pulse disappeared.
- Deflate the cuff gradually till you feel the pulse appear again. The level at which the pulse reappears gives the systolic BP.
- Deflate the cuff by loosening the screw of the rubber bulb.
- Now raise the pressure of the cuff again to 30 mmHg above the level at which the radial pulse was no longer palpable.
- Place the stethoscope on the cubital fossa, ensuring that the diaphragm is in contact with the skin. Ideally, you should not hear any sound. Ensure that you are using the stethoscope correctly, with the earpieces facing forwards when placed in the ears.
- Lower the pressure of the cuff slowly, by about 2 mmHg at a time, till you start hearing repetitive thumping sounds. The reading at which the sound first starts is the systolic BP.
- Continue lowering the pressure until the sound first gets muffled and finally disappears. The reading at which the sounds finally disappear is the diastolic BP.
- Note the BP on a paper as "systolic BP/diastolic BP".
(a) MEASURING THE FUNDAL HEIGHT

- Ask the woman to empty her bladder completely immediately before proceeding with the abdominal examination. This is important as even a half full bladder might result in an increase in the fundal height.

- Ask the woman to lie on her back with the upper part of her body supported with pillows or a rolled bed sheet. Never make a pregnant woman lie flat on her back for a prolonged period as the heavy uterus may compress the main blood vessels returning to the heart and cause fainting (supine hypotension syndrome). Ask her to partially flex her hips and knees.

- Stand on the right side of the woman to examine her in a systematic manner.

- The attention of the woman may be diverted by conversation.

- Your hand must be warm and should be placed on the abdomen till the uterus is relaxed before you begin palpation. Poking the abdomen with the fingertips should be avoided at all costs.

- To measure the fundal height, place the ulnar (medial) border of the hand on the woman’s abdomen, parallel to the symphysis pubis. Start from the xiphisternum (the lower end of the sternum) and gradually proceed downwards towards the symphysis pubis, lifting your hand between each step down, till you finally feel a bulge/resistance, which is the uterine fundus.

- Mark the level of the fundus. Using a measuring tape (a tailor’s tape measure which is made of non-stretchable material), measure the distance (in cm) from the upper border of the symphysis pubis to the top of the fundus. After 24 weeks of gestation, the fundal height (in cm) corresponds to the gestational age in weeks (within 1-2 cm deviation). Remember, at the time of measuring the fundal height in cm, the legs of the woman should be straight and not flexed.

- The supine position in late pregnancy and labour has also been shown to be associated with higher fundal height readings; therefore, this can give rise to false readings and an inaccurate estimate of the gestational age. It is therefore recommended that the woman lies down in a semi-recumbent position when measuring the fundal height.

- When the same operator is measuring the fundal height at each visit, this technique has been shown to have good predictive value, especially for identifying major intrauterine growth retardation and multiple pregnancy.

- The normal fundal height varies at different weeks of pregnancy. To estimate the gestational age through the fundal height, the abdomen is divided into parts by imaginary lines. The most important one is the one passing through the umbilicus. Then divide the lower abdomen (below the umbilicus) into 3 parts with 2 equidistant lines between the symphysis pubis and the umbilicus. Similarly, divide the upper abdomen into three parts, again with two imaginary equidistant lines, between the umbilicus and the xiphisternum.

- Note the fundal height and judge as given below:
  * At 12th week: just palpable above the symphysis pubis
  * At 16th week: lower one-third of the distance between the symphysis pubis and umbilicus
  * At 20th week: two-thirds of the distance between the symphysis pubis and umbilicus
  * At 24th week: at the level of the umbilicus
  * At 28th week: lower one-third of the distance between the umbilicus and xiphisternum
  * At 32nd week: two-thirds of the distance between the umbilicus and xiphisternum
  * At 36th week: at the level of the xiphisternum
* At 40th week: sinks back to the level of the 32nd week, but the flanks are full, unlike that in the 32nd week.
(b) DETERMINING THE FOETAL LIE AND PRESENTATION

- The pelvic grips (4 in number) are performed to determine the lie and the presenting part of the foetus.
- Ask the woman to lie down on her back. Ask her to partly flex her legs at the knees and hips and keep them slightly apart.

Fundal palpation/fundal grip

- Fundal palpation helps to determine the lie and presentation of the foetus.
- Palpate the uterine fundus gently by laying both hands on the sides of the fundus to determine which pole of the foetus (the breech or the head) is occupying the uterine fundus. The head feels like a hard globular mass which is ballotable (moves between the fingertips of the two hands), whereas the breech is of a softer consistency and has an indefinite outline.
- In the case of a transverse lie, the fundal grip will be empty.
Lateral palpation/lateral grip

- This palpation is used to locate the back of the foetus to determine the position.

- Place the hands on either side of the uterus at the level of the umbilicus and apply gentle pressure. The back of the foetus is felt like a continuous hard, flat surface on one side of the midline and the limbs are felt as irregular small knobs on the other side.

- In the case of a transverse lie, the back is felt transversely, i.e. stretching across both sides of the midline.
The first pelvic grip/superficial pelvic grip

- The third manoeuvre must be performed gently, or it will cause pain to the woman. Spread your right hand widely over the symphysis pubis, with the ulnar border of the hand touching the symphysis pubis. Try to approximate the finger and thumb, putting gentle but deep pressure over the lower part of the uterus. The presenting part can be felt between the fingers and the thumb. Determine whether it is the head or the breech (in the case of a longitudinal lie).

- The mobility of the presenting part can also be determined by gripping the presenting part and trying to move it. If it can be moved, it indicates that the presenting part is free and not "engaged". The foetal head is said to be engaged if the widest diameter of the foetal head has passed through the brim of the pelvis, and only one pole of the head or only two finger-breadths are felt above the pelvic brim.

- In the case of a transverse lie, the third grip will be empty.
The second pelvic grip/deep pelvic grip

- To perform this grip, you must face the foot end of the mother. Keep both the palms of your hand on the sides of the uterus, with the fingers held close together, pointing downwards and inwards, and palpate to recognize the presenting part.
- If the presenting part is the head (felt like a firm, round mass, which is ballotable, unless engaged), this manoeuvre, in experienced hands, will also be able to tell you whether it is in a state of flexion.
- If the woman cannot relax her muscles, tell her to flex her legs slightly and to breathe deeply. Palpate in between the deep breaths.

*Deep pelvic grip*
(c) AUSCULTATING FOR THE FOETAL HEART SOUND (FHS)

- Use a foetoscope or the bell of the stethoscope to auscultate for the FHS. Remember, the FHS is best heard on the side where the spine/back of the foetus is. For a normal vertex presentation, the FHS is best heard midway between the line joining the umbilicus and the anterior superior iliac spine, on the side where the back is.
- In a breech presentation, the FHS is usually heard above the umbilicus.
- Count the foetal heart rate for one full minute.
Near term or during labour, a vaginal examination needs to be done to assess the pelvis. This observation is very important in a primigravida or in a multigravida where there is a history of prolonged or difficult labour, which could be associated with CPD.

• Ask the woman to pass urine and empty her bladder, and lie down in the dorsal position (on her back) with her knees slightly bent and apart.
• Wash your hands thoroughly and put on sterile gloves.
• Clean the external genitalia with a swab dipped in an antiseptic solution, in the anterior to posterior direction. Use a swab ONLY ONCE.
• With the thumb and index finger of the left hand, separate the labia. Insert the examining fingers (index and fingers) of the right hand into the vagina following the direction of the vagina upwards and backwards.
• Ask the woman to relax, as this will minimize discomfort.
• Try to reach the sacral promontory with the middle finger. The fingers should be in a nearly horizontal position. Normally, the sacral promontory cannot be reached. This indicates that the anteroposterior diameter of the pelvic inlet is adequate. If the sacral promontory is reached, at the end of pelvic examination before removing the fingers, feel for the promontory again and mark with the forefinger of the left hand the point where the hand is in contact with the lower border of the symphysis pubis. After withdrawing your fingers, measure the distance between that point and the tip of the middle finger with a ruler. This is the diagonal conjugate. By subtracting 1.5-2 cm (width of the symphysis pubis) from the diagonal conjugate, the anteroposterior diameter of the pelvic inlet is obtained.
• Sweep the fingers from above downwards over the **sacrum** to note the sacral curve and from side-to-side over the ala of the sacrum. From above downwards, the sacral curve is backwards and smooth. The sacrum is usually inaccessible beyond the lower three pieces.

![The sacrum](image1)

• Feel for the **sacrosciatic notch**. Usually the notch is sufficiently wide for two fingers to be easily placed over the sacrospinous ligament covering the notch.

![The sacrosciatic notch](image2)

• Feel the **ischial spines** on both the sides. Normally, the spines are smooth and everted, and difficult to palpate. Spread the examining fingers. Normally, they cannot touch both the spines at the same time. But if they are prominent and encroach into the cavity, they will diminish the space available in the mid-pelvis.

![The ischial spines](image3)
• Note the lowest level of the presenting part in relation to the ischial spines.
• Feel the *sidewalls* of the pelvis. Normally, they are nearly parallel. Therefore, unless they are convergent, they are not easily palpable by sweeping the fingers over them.

![The sidewalls](image)

The *sidewalls*

• The posterior surface of the *symphysis pubis* is normally a smooth, rounded curve. The presence of angulation or breaking suggests an abnormality.
• The *pubic angle* is formed by the inferior pubic rami and, in females, the angle roughly corresponds to the angle formed by the fully abducted thumb and index finger. In a narrow angle, it roughly corresponds to the angle formed by the fully abducted middle and index fingers.

![The pubic angle](image)

The *pubic angle*
• Measure the **transverse diameter of the outlet** by placing the knuckles of the first interphalangeal joints or the knuckles of a clenched fist between the two ischial tuberosities. Normally, it admits four knuckles.

The transverse diameter of the outlet

Therefore, in a **normal pelvis**
• The sacral promontory is not reached.
• The sacrum is well curved.
• The sacrosciatic notch admits two fingers.
• The sidewalls are nearly parallel.
• The ischial spines are not prominent and both cannot be felt at the same time.
• The transverse diameter of the outlet admits 4 knuckles.

**Besides assessing the pelvis, you also need to assess for CPD**.
• Push the head into the brim with the abdominal hand placed over the symphysis pubis and feel for the level of descent with the fingers in the vagina. If the head can be pushed through the brim or the head is engaged, then there is no CPD.
The level of haemoglobin may be estimated by various methods such as:

- Sahli’s haemoglobinometer
- Cyanmethaemoglobin method
- Haemacue method
- World Health Organization (WHO)-approved Haemoglobin Colour Scale (awaiting approval for use in India)

You may follow in your PHC any method that is feasible depending on the availability of reagents/materials and the trained staff required for the test.
(a) THE PRESENCE OF PROTEIN
You may use various methods such as:
- Uristix (instructions to be followed as given in the leaflet provided by the manufacturer)
- The heat method

(b) THE PRESENCE OF SUGAR
You may use various methods such as:
- Diastix (instructions to be followed as given in the leaflet provided by the manufacturer)
- The Benedict reagent method

The second fasting sample is more reliable for testing the presence of sugar in the urine. The first early morning sample (fasting) of urine is discarded, and the sample of urine after that (fasting again) is tested.

(c) BACTERIURIA
You may use the "Bact-stix" for this purpose (instructions to be followed as given in the leaflet provided by the manufacturer).
Some Dos and Don'ts for prescribing drugs to women of childbearing age

- Always check if a woman is pregnant before prescribing any drugs.
  * Ask her the date of the last menstrual period (LMP). If the LMP is more than 3 weeks earlier, she could be in an early stage of pregnancy.
  * Rule out pregnancy if the date of LMP is more than 1 month ago
- Ask yourself: Is the drug likely to give more benefit than harm to the woman and, if pregnant or lactating, to her baby? If it is more likely to be harmful, look for an alternative.
- If a woman is on medication before pregnancy, pre-pregnancy counselling should be considered if she plans a pregnancy. In case she is already pregnant, continue the drug, e.g. antitubercular, antiepileptic, etc.
- Avoid ALL drugs as far as possible in early pregnancy. Use a drug if that is the only option available, e.g. if she is on antiepilepsy medication, give her the minimum effective dose required to prevent seizures and also prescribe folic acid .5 mg to be taken daily.
- In case the mother develops a disease that is likely to harm her and/or the baby, treat appropriately. For example, though prophylaxis against malaria is best avoided in the first trimester, the therapeutic dose should be given in case the woman develops malaria, even in the first trimester, as malarial fever causes more harm to the mother and baby than the drugs used to treat it.
- While teratogenicity is usually confined to drug use in early pregnancy, some drugs can affect the outcome when used in late pregnancy too (e.g. tetracyclines, non-steroidal anti-inflammatory drugs [NSAIDs])
- When in doubt as to whether or not a drug should be used, search for and read the relevant information.
- If the woman has been exposed to potentially harmful drugs in early pregnancy
  * Try to ascertain the exact time of exposure and the dose received
  * An early scan may be helpful in determining the duration of pregnancy
  * Involve perinatal obstetricians, wherever possible, in such cases.

Table 25. Drugs to be avoided during early pregnancy

<table>
<thead>
<tr>
<th>Drug</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol</td>
<td>Foetal alcohol syndrome</td>
</tr>
<tr>
<td>Androgens</td>
<td>Virilization and multiple congenital defects</td>
</tr>
<tr>
<td>Antineoplastic agents</td>
<td>Multiple congenital defects</td>
</tr>
<tr>
<td>Carbimazole</td>
<td>Aplasia cutis</td>
</tr>
<tr>
<td>Corticosteroids (high dose)</td>
<td>Cleft palate</td>
</tr>
<tr>
<td>Diethylstilboesterol</td>
<td>Vaginal adenosis and adenocarcinoma in a female foetus</td>
</tr>
<tr>
<td>Ergotamine</td>
<td>Increased uterine tone</td>
</tr>
<tr>
<td>Misoprostol</td>
<td>Increased uterine tone</td>
</tr>
<tr>
<td>Fibrinolytic drugs</td>
<td>Separation of the placenta</td>
</tr>
<tr>
<td>Tetracyclines</td>
<td>Yellowish discoloration of the teeth; inhibition of bone growth</td>
</tr>
<tr>
<td>Valproate</td>
<td>Neural tube defects</td>
</tr>
<tr>
<td>Warfarin</td>
<td>Multiple congenital defects</td>
</tr>
</tbody>
</table>
### Table 25b: Drugs that have an increased risk of producing abnormalities

<table>
<thead>
<tr>
<th>Drug</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amiodarone</td>
<td>Goitre</td>
</tr>
<tr>
<td>Chloroquine</td>
<td>Deafness</td>
</tr>
<tr>
<td>Lithium</td>
<td>Goitre, cardiovascular defects</td>
</tr>
<tr>
<td>Phenytoin</td>
<td>Multiple congenital defects</td>
</tr>
</tbody>
</table>

### Table 25c: Drugs that have a theoretical risk (from animal and other studies)

- Angiotensin-converting enzyme (ACE) inhibitors
- Calcium-channel antagonists
- Co-trimoxazole
- Fibrates
- Griseofulvin
- Ketoconazole
- Mebendazole
- Trimethoprim

### Table 26: Drugs to be avoided or used with care during late pregnancy

<table>
<thead>
<tr>
<th>Drug</th>
<th>Risk to foetus/neonate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspirin</td>
<td>Kernicterus, haemorrhage</td>
</tr>
<tr>
<td>Aminoglycosides</td>
<td>Damage of the eighth nerve</td>
</tr>
<tr>
<td>Antithyroid drugs</td>
<td>Goitre and hypothyroidism</td>
</tr>
<tr>
<td>Benzodiazepines</td>
<td>Floppy baby syndrome</td>
</tr>
<tr>
<td>Chloramphenicol</td>
<td>Peripheral vascular collapse</td>
</tr>
<tr>
<td>Fibrinolytic drugs</td>
<td>Foetal/maternal haemorrhage</td>
</tr>
<tr>
<td>Misoprostol</td>
<td>May induce labour</td>
</tr>
<tr>
<td>Narcotic analgesics</td>
<td>Respiratory depression</td>
</tr>
<tr>
<td>Nitrofurantoin</td>
<td>Haemolysis</td>
</tr>
<tr>
<td>NSAIDs</td>
<td>Closure of ductus arteriosus, delayed prolonged labour</td>
</tr>
<tr>
<td>Oral anticoagulants</td>
<td>Foetal retroplacental haemorrhage, microcephaly</td>
</tr>
<tr>
<td>Sulphonylureas</td>
<td>Hypoglycaemia</td>
</tr>
<tr>
<td>Pethidine</td>
<td>Respiratory depression</td>
</tr>
<tr>
<td>Reserpine</td>
<td>Bradycardia, hypothermia, respiratory distress</td>
</tr>
<tr>
<td>Sulphonamides</td>
<td>Kernicterus</td>
</tr>
<tr>
<td>Tetracyclines</td>
<td>Yellowish discoloration of the teeth, inhibition of bone growth</td>
</tr>
<tr>
<td>Thiazide diuretics</td>
<td>Thrombocytopenia</td>
</tr>
</tbody>
</table>
Antibiotics/antibacterials that are safe for use in pregnancy

- Amoxycillin (with or without clavulanic acid)
- Ampicillin
- Cloxacillin
- Phenoxyethyl penicillin
- Benzyl penicillin
- Benzathine penicillin
- Procaine penicillin
- Cephalexin
- Cefazolin
- Cefotaxime
- Ceftazidime
- Ceftriaxone
- Cefuroxime
- Rifampicin

Antibiotics/antibacterials that are contraindicated in pregnancy

- Ciprofloxacin
- Doxycycline
- Erythromycin
- Gentamicin
- Streptomycin
- Metronidazole
- Tinidazole
- Nalidixic acid
- Sulphadiazine (during the third trimester)
- Chloramphenicol (during the third trimester)

Antibiotics/antibacterials whose safety profiles for use in pregnancy have not yet been established

- Nystatin
- Co-trimoxazole
- Tetracycline
- Trimethoprim
- Chloramphenicol
Annexure-7
PREPARING "CLEAN" GLOVES

• Wash the gloves with soap and water.
• Check the gloves for damage. Blow the gloves full of air, twist the wrist end closed, then hold under clean water and look for air leaks. If bubbles are formed, there is a leak. Discard the gloves if they are damaged.
• Soak the gloves for 20 mins in a solution of bleaching powder containing 0.5% available chlorine. (This solution can be made by adding 90 ml water to 10 ml of bleach containing 5% available chlorine.)
• Rinse the gloves with 20 mins boiled, cool water to wash out the bleach solution.
• Dry the gloves away from direct sunlight.
• Dust the inside of the gloves with talcum powder or starch.

NOTE: This procedure produces disinfecte gloves. These gloves are NOT sterile.

Good quality latex gloves can be disinfected in this manner 5 times or more.
Dilatation of the cervical os is measured in centimetres (cm), fingers, percentages and inches. These guidelines refer to cervical dilatation in cm. If you use another method of measuring, convert into cm using the following information:

- 1 finger = 0.5 inch or 1.25 cm
- 2 fingers = 1¼ inches or 3 cm
- 3 fingers = 1⅞ inches or 4.5 cm
- 4 fingers = 2¼ inches or 5.5 cm
- 5 fingers = 50% dilatation = 2½ inches or 7 cm
- 6 fingers = 75% dilatation = 3½ inches or 8.5 cm
- 7 fingers = 95% dilatation or rim = 3¾ inches or 9.5 cm

Once 50% dilatation has been achieved, estimate the length of cervix remaining during the vaginal examination. For instance, when the dilatation is 75%, you will feel only a circle of cervix about the width of a finger remaining. When the dilatation is 95%, you will feel only a very thin rim of the cervix. The cervix will now soon slip over the foetal head. The second stage of labour will begin soon. Once the cervix is fully dilated, it is no longer felt on vaginal examination.

To practise measuring cervical dilatation, use rings and bangles of varying diameters (varying from 1 to 10 cm) or a cardboard sheet in which circles of varying diameters (1-10 cm) have been cut out. Insert your index and middle fingers in each bangle/ring/circle and spread them apart to “get the feel” of the dilatation with your fingers kept apart. To evaluate yourself, close your eyes and pick up any ring/bangle/circle of any diameter. Spread your fingers and try to guess the diameter of that ring/bangle/circle.
Annexure-9
PROCEDURE FOR CONTROLLED CORD TRACTION (CCT)

- Clamp the maternal end of the umbilical cord close to the perineum with a pair of forceps.
- Hold this clamped end and the forceps with one hand.
- Place the other hand just above the woman's pubic bone. This is to stabilize the uterus by applying counter-traction (pressure in the opposite/upward direction) on the uterine fundus during CCT.
- Maintain slight tension on the cord and wait for a strong uterine contraction. Massaging the abdomen over the uterus before applying CCT will ensure a contraction and help in preventing complications such as inversion of the uterus.
- When the uterus contracts, as will be evidenced by the uterus becoming hard and globular, or when the extra-vulval portion of the cord lengthens, gently pull downwards on the cord to deliver the placenta. Continue to apply counter-traction on the uterus with the other hand.
- If the placenta does not descend within 30-40 seconds of CCT, i.e. there are no signs of placental separation, do NOT continue to pull on the cord.
- The signs of placental separation are as below:
  * The uterus becomes hard and globular (uterine contraction).
  * The extra-vulval portion of the cord lengthens.
  * There is a sudden gush of blood when the placenta separates.
  * If the fundus of the uterus is gently pushed up towards the umbilicus, the cord will not recede into the vagina.
- Wait for the next uterine contraction and repeat CCT with counter-traction.
- As the placenta delivers, hold it with both hands to prevent tearing of the membranes.
- If the membranes do not slip out spontaneously, gently turn the placenta so that the membranes are twisted into a rope and move them up and down to assist separation. If pulled at, the thin membranes can tear off and may be retained in the uterus.
- If the membranes tear, gently examine the upper vagina and cervix and use your fingers or a pair of sponge forceps to remove any pieces of membrane that might be present.
- **Remember, you should never apply cord traction (pull) without applying counter-traction (push) above the pubic bone with the other hand.**
Uterine massage and expulsion of clots should be carried out in case heavy postpartum bleeding persists after the placenta has been delivered, or the uterus is not well contracted (is soft).

Place your cupped palm on the uterine fundus and feel for the state of contraction.

Massage the uterine fundus in a circular motion with the cupped palm until the uterus is well contracted.

When well contracted, place your fingers behind the fundus and push down in one swift action to expel clots.

Collect the blood in a container or over a clean plastic sheet placed close to the vulva. Estimate and record the blood loss.
Annexure-11

EXAMINATION OF THE PLACENTA, MEMBRANES AND UMBILICAL CORD

Placenta

*Maternal surface of the placenta*

- Hold the placenta in the palms of the hands, keeping the palms flat and the maternal surface facing you. Look for the following:
  - All the lobules must be present.
  - The lobules should fit together.
  - The margins should be regular.
- After rinsing the maternal side carefully with water, it should shine because of the decidual covering.
- If any of the lobes are missing or the lobules do not fit together, suspect that some placental fragments may have been left behind in the uterus.

*Foetal surface of the placenta*

- Hold the umbilical cord in one hand and let the placenta and membranes hang down like an inverted umbrella.
- The umbilical vessels will be seen passing from the cord and gradually fading into the edge of the placenta.
- Look for free-ending vessels and holes which may indicate that a succenturiate lobe has been left behind in the uterus.
- Look for the insertion of the cord, particularly the velamentous insertion (the point where the cord is inserted into the membranes and from where it travels to the placenta).

Membranes

- The chorion is the layer in contact with the uterus. It is rough and thick.
- The amnion is the inner layer. It is thin and shiny.
- The amnion can be peeled up to the level of insertion of the cord.
- The edge of the hole where the membranes rupture and the foetus comes out reveals both the layers.
- If the membranes are ragged, place them together and ascertain their completeness.

Umbilical cord

- The umbilical cord should be inspected. It has two arteries and one vein. If only one artery is found, look for congenital malformations in the baby.