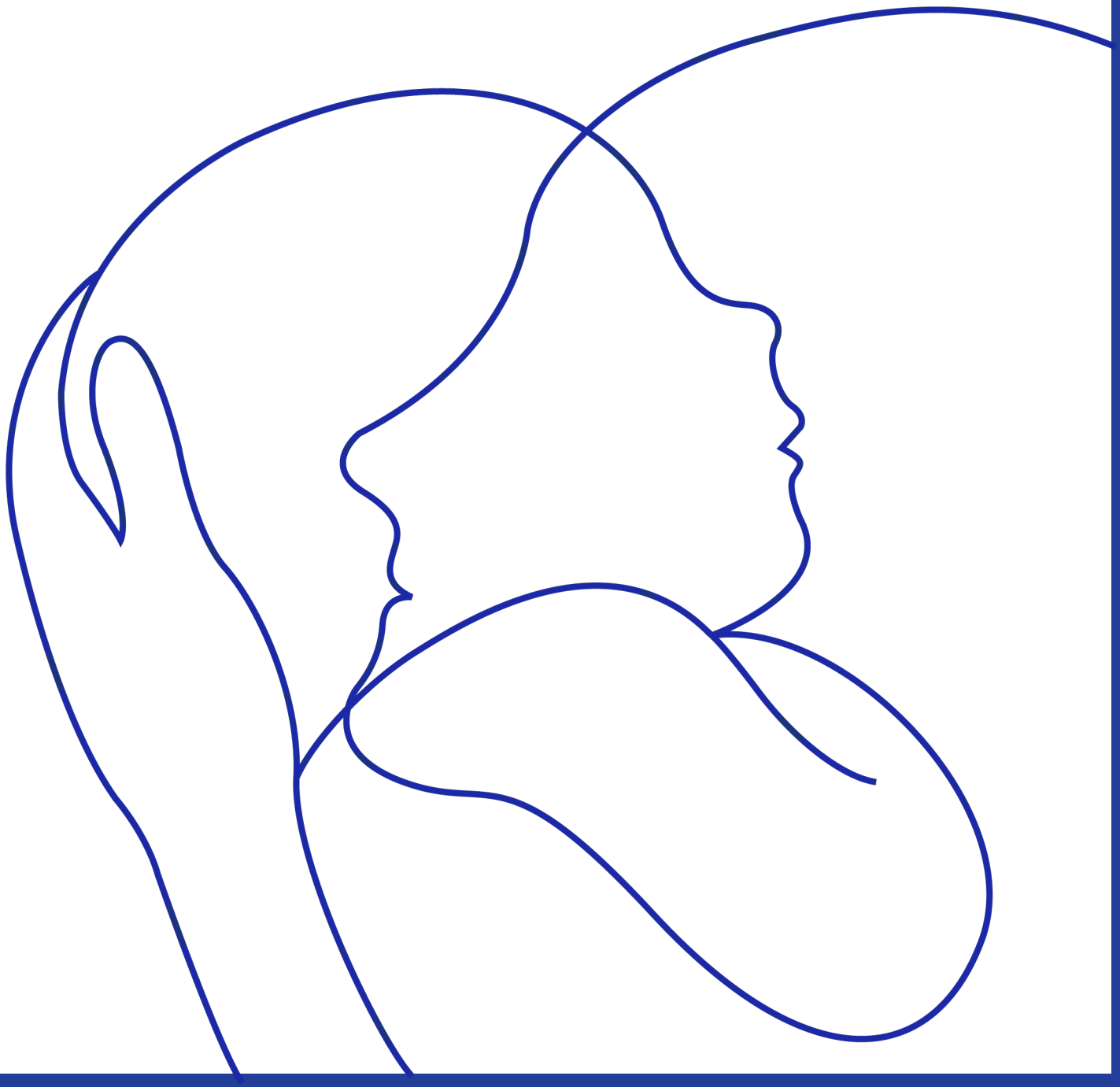
Life-Saving Skills

Manual for Midwives

4th Edition

"Used since 1990 by doctors, nurses, midwives, and other skilled birth attendants..."



Module 7. Infections **Module 8. Stabilize and Refer**

About the Life Saving Skills Manual Fourth Edition Materials

The Life-Saving Skills Manual for Midwives,* *and its training program process, builds on years of experience of midwives practicing in rural and urban areas. The critical issues of family and community support and education are woven throughout the manual. The* ***LSS Manual*** *is focused on strengthening the capacity of midwives and others with midwifery skills to save the lives of women and babies. The management, medications, equipment and procedures suggested in the manual assume that only the most basic provisions are usually available (LSS 3rd Edition, 1998).*

What is the *LSS Manual*?

- Continuing education of **critical knowledge** for practicing midwives, nurses, doctors, other skilled birth attendants
- A Problem Solving Method to identify and manage woman and baby complications and care
- A review of skills and information
- New or updated skills and information
- Resource to supplement pre-service training
- Clinical reference

The *LSS Manual* has 5 books – 2 modules in each book:

Book 1	Module 1: Introduction,	Module 2: Antenatal
Book 2	Module 3: Labor,	Module 4: Episiotomy
Book 3	Module 5: Hemorrhage,	Module 6: Resuscitation
Book 4	Module 7: Infections,	Module 8: Stabilize & Refer
Book 5	Module 9: VE & Others,	Module 10: Postpartum

In each module:

- ***LSS Manual*** table of contents lists major module topics.
- Module table of contents with module page numbers.
- Statement of the goal and objectives.
- An introduction to give an idea of what is in the module.
- An experience of a midwife or doctor linked to the topic.
- Common medical terms are defined.
- Skill procedures with a skill description, illustrations, review questions and case studies.
- Learning Aids for additional information, used as needed, were developed in response to requests from practicing LSS midwives.
- *Index* for the entire manual is found inside the back cover of each book. The index lists the subjects in alphabetical order. Some subjects may be listed under more than one name. For example, information on hemorrhage, may be found under hemorrhage or bleeding.
- *Page numbers* are numbered with both the **module number** and the **page number**. For example, the number 5.3 is found in Module 5 on page 3. To find laceration of the cervix – look in the index, it is listed with number 4 indicating Module 4. Module 4 table of contents Cervical Laceration is listed on page 4.23. The information is on page 23.

What is the Guide for Caregivers?

It is a **separate and smaller book that comes with the LSS Manual** for use when learning and giving care. It includes:

- Skill checklist for each skill procedure, a step by step outline of procedures for Modules 2 through 10. The learner and trainer fill out the appropriate skill checklist and discuss how the steps were performed. It may be used after training, to review and practice skills or as reference.
- Formulary is a reference of suggested drugs with space to add according to local situations.
- Protocols give woman and baby care guidelines for LSS topics. This section may be reviewed in-country and adapted for local situations.

What is the Manual for Policy Makers and Trainers: A Life-Saving Skills Training Program Process?

It is a **separate book, sold separately,** used to develop and manage LSS training programs:

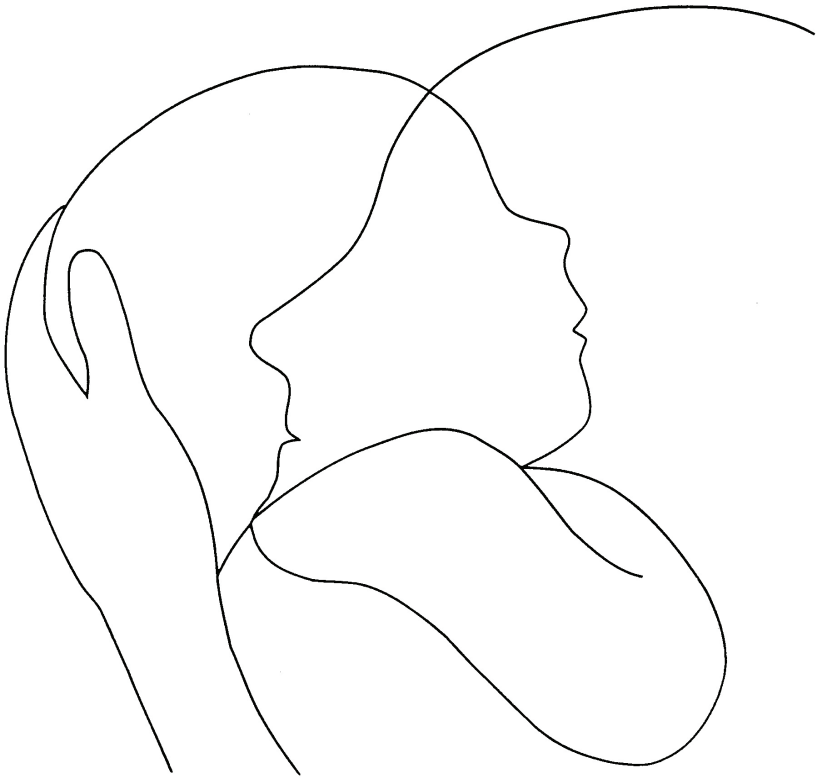
- A Ten Step Program Process includes experience and ideas from LSS programs in many countries.
- Trainers Section provides clinically active LSS learners opportunities to develop confidence and competence. The LSS trainer is not concerned as much about the **quantity** of times a particular skill is performed, but more about the **quality** with which it is performed.
- Sample Lesson Plans, Program Tools, Training Aids, and Forms for use, adaptation, and revision for local needs.

*** Note:** Much thought went into the naming of the manual, ***Life-Saving Skills Manual for Midwives.*** It was decided to highlight the **midwife,** as in many situations, the midwife is the first person called to help with a pregnancy related problem. Women and men using this manual to prevent and care for problems that cause women and babies to die during pregnancy, childbirth and postpartum might be called a doctor, nurse, midwife, or other skilled birth attendant. This manual **acknowledges and respects all who help. The manual uses the term midwife, and the pronouns 'she or her'** rather than alternating titles, pronouns (she/he) or using a generic description.

Life-Saving Skills
Manual for Midwives

Fourth Edition

Module 7: Infections – Prevent and Manage



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American College of Nurse-Midwives

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All those using this manual have a responsibility to review with their supervisors and medical authorities about medicines and medical procedures. This manual should be taught using hands-on clinical training. Procedures should only be done when they are mastered, when you are competent and confident. Always look, read, listen, learn, and ask to make sure you are offering safe and effective care to women and their babies.

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Life-Saving Skills Manual for Midwives
MANUAL TABLE OF CONTENTS

INFECTIONS – PREVENT AND MANAGE

MODULE 7

Table of Contents

INFECTIONS – PREVENT AND MANAGE

Goal

The midwife will review and update her knowledge and skills to prevent and manage infections in women and babies using the problem solving method.

Objectives

The midwife caring for women and babies during and after pregnancy will be able to:

1. **ASK and LISTEN.** Take the woman and newborn history to identify possible problems, including infections in women and babies.

2. **LOOK and FEEL.** Perform physical examination for woman and newborn to identify infections in women and babies.

3. **IDENTIFY PROBLEMS and NEEDS.** Use the information from history and examination to decide the problems and needs from infections including HIV/AIDS.

4. **TAKE APPROPRIATE ACTION.** Decide what should be done for the infections including managing problems, providing clinical education and counseling, and preventing infections in women and babies.

5. **EVALUATE / REPEAT THE PROCESS.** Decide with the woman / family the results of the care. Repeat the problem solving steps to find out whether there is a change in the problem.

6. Describe universal precautions (standards) for infection prevention.

7. Demonstrate the infection prevention steps.

Introduction

Infection is a major cause of illness and death among women and babies. **Over 11% of maternal deaths world wide come from sepsis and other infections. About 36% of neonatal deaths in the world are from infections.** A woman, baby or caregiver can easily get germs that cause infection. You will learn how to use the infection prevention method to prevent infection by killing or controlling harmful germs. When germs get into someone's body, they can cause fever, shock, failure of the kidneys, and death. If the woman does not die, she may suffer with chronic illness. In malaria endemic areas, malaria can infect the placenta of a pregnant woman, causing sickness for the woman and baby including death.

You will learn to use the problem solving process to save lives of mothers and babies by identifying and treating problems. **Learning Aids** help you review and learn new information and procedures you may not perform often, but may help you save a life. Look in the *Guide for Caregivers* for Skill Checklists.

A Midwife's Experience ...

A 43 year old gravida 11 came complaining of severe lower abdominal pain for the past 2 days, dizziness, and couldn't walk. Her BP 110/50, pulse 160, temperature 38.6° C (102° F) and abdomen tender to touch. It was on Tuesday, which is our market day so there was transportation available. Judging from her age and parity, I thought could this be appendicitis or infection? The BP too could not give me a clue as to ectopic. I decided to refer her immediately to hospital. Luck was not on my side. The only doctor had traveled.

So they returned to me on a Thursday with a BP 60/0. I set up Dextrose 5% IV, gave antibiotic, and arranged for a boat to take her to the hospital on the river. This woman will prefer to die in my clinic if I won't accompany her to the hospital myself, for fear that if she does not meet any doctor, she won't know what to do and she believes my company will help her receive prompt treatment. So we got a boat, which took almost my one-month's salary. Immediately we got there, a blood transfusion was arranged for and I gave a pint of blood. I left on the third day for my station. I had lost all confidence as I knew this woman was going to die. But she survived.

LSS Midwife, Ghana

Note: This midwife is 13 hours to 3 days from a referral hospital depending on the weather and available transport. She is the only trained health staff for miles around. She cares and is trusted.

Common Medical Terms

Abortion – pregnancy loss (spontaneous or induced), the fetus is not viable (not able to live outside of the uterus), usually less than 24 weeks gestation. The definition varies from 16 to 28 weeks in various parts of the world – use accepted local definition. Baby weight less than 0.5 kg (1.1 pounds). Products of conception come out of the uterus.

Amnion – the inside layer of membranes (bag of waters) covering the fetal side of the placenta and the chorion.

Antiseptic – a substance that slows or stops the growth or action of germs especially in or on living tissue, see examples in **Learning Aid 10.**

Aseptic Technique or Asepsis – the steps to prevent germs going into any part of the body where they may cause infection. To reduce germs to a safe number, or eliminate (remove all) them.

Chorioamnionitis – infection in the uterus with inflammation of the chorion and amnion. It is inflammation of the amniotic sac (bag of waters).

Chorion – the outside layer of membranes covering the woman's side of the placenta (bag of waters) holding the amniotic fluid (liquor) and the baby.

Chronic Pelvic Infection – a long term infection in the reproductive tract; it causes swelling, pain, redness, and foul smelling discharge. It will make a woman very weak, malnourished and not able to do normal functions of life. Without treatment this can lead to infertility, chronic pain, and death.

Cleaning – the second step in the infection prevention method. Remove all blood, body fluids, and any other foreign material such as dust or dirt by washing with soap and water, then rinsing with water.

Decontamination – the first step in the infection prevention method. Soak in 0.5% chlorine solution for 10 minutes. Kills germs and some viruses (hepatitis and HIV).

Disinfectant – a chemical solution that destroys microorganisms (germs and some viruses) or stops them from causing infection such as 0.5% chlorine solution, see Learning Aid 10 – section on high level disinfection with chemicals.

Disinfectant Cleaning Solution – a solution, with a detergent (soap), a disinfectant, and water, used to clean labor and patient care areas and furniture.

Ectopic Pregnancy – a pregnancy in which the fertilized egg is implanted (attached) outside the uterus. It can also be called an extrauterine pregnancy (outside of the uterus). The fertilized egg attaches most commonly in the fallopian tube, sometimes in the abdominal cavity or ovary.

Emergency – a time when action must be taken immediately to save a person's life. For instance, if someone is not breathing, you must help the person to breathe now so that she will not die.

Endospore or spore – a microorganism with a hard protective covering. A very difficult microorganism to kill. Tetanus germs are endospores.

High-Level Disinfection (HLD) – the third step in the infection prevention method when sterilization is not possible. A method that kills most germs and viruses, but can not kill some bacterial endospores. The HLD methods are boiling, steaming, or soaking in specific chemicals.

Infection Prevention Method – a way of decontaminating, cleaning, and then high-level disinfecting or sterilizing contaminated equipment and supplies.

Infertility – the inability of a couple to conceive. A man or woman not able to conceive a baby. One or both may be infertile.

Intrauterine Infection – an infection of the uterus.

Mastitis – infection of the breast.

Microorganisms (germs) – very small (micro) living things (organisms) which can be seen only with a microscope. Bacterial germs enter a person's body and grow in number causing infection. Other germs cause tuberculosis or tetanus.

Miscarriage (spontaneous abortion) – pregnancy loss; the fetus is not viable; products of conception come out of the uterus without any assistance.

Postpartum Infection (puerperal sepsis) – an infection in the uterus after the baby is born up to 6 weeks postpartum; infection usually enters the uterus through the cervix; infection may go from reproductive tract through the lymph system or bloodstream to cause infection in the woman.

Reproductive Tract – includes the female pelvis: pelvic bones, pelvic floor muscles, vulva, vagina, uterus, fallopian tubes, and ovaries.

Residual Spraying – Indoor residual spraying (IRS) is the application of small amounts of insecticide to the interior walls of houses to kill or sometimes repel malaria-transmitting mosquitoes. IRS is a highly effective, proven malaria prevention strategy that saves lives.

Sepsis – an infection that happens when bacteria enter a person's body and grow, causing sickness.

Septic Abortion – very serious infection in the uterus; germs go into the reproductive tract during or after the loss of a pregnancy (abortion); can lead to death.

Septic Shock – very serious infection of the blood which causes high fever, low blood pressure, fast heart rate, and fast breathing. Untreated septic shock leads to coma and death.

Sterilization – the third step in the infection prevention method when sterilization is possible. The method kills all microorganisms, even endospores, with high-pressure steam (autoclave), dry heat (oven), specific chemicals, or radiation.

Tetanus Infection – an infection caused by a bacterium endospore (bacillus) which produces a deadly poison. Untreated tetanus infection causes convulsions and death within 2 weeks.

Unsafe Abortion – pregnancy loss caused by dangerous medicine, instruments, or unskilled persons used to end a pregnancy in unclean conditions.

Universal Precautions – infection prevention standards using barriers to prevent contact with blood and body fluids for everyone. Assume that all blood and body fluids may be contaminated; discussed throughout this module.

Virus – very small germs, not visible with a common microscope, which live on nutrients inside of cells. Antibiotics do not kill viruses.

PREVENT INFECTIONS

Infection is caused by germs. Germs can be passed from person to person. The midwife can reduce the chances of passing or getting germs by using safe infection prevention methods when giving care to women and babies. Midwives are responsible to make sure that everything used in giving care is properly decontaminated, cleaned, and high-level disinfected or sterilized. The midwife teaches women, their families, traditional birth attendants (TBAs), and others, about preventing the spread of germs during pregnancy, childbirth, postpartum and in their personal life.

Strategies to Prevent Infection and Save Lives

Infection makes people sick and can cause death. It is one of the major causes of death in women and babies during birth and after the baby is born. When giving care during and after pregnancy, there is a risk of infection to women and babies, and also to providers and other staff. There may be contact with blood and other body fluids that carry diseases. To reduce the risk, **universal precautions** (blood and body fluid safety) with all clients and providers must always be carried out while giving care, using equipment, and disposing of waste. The infection prevention procedures discussed here can be used in any country or health facility. The strategies to prevent infection during labor and childbirth include:

- Learn how germs get into the body (cause and transmission)
- Prevent Infection by keeping germs away
- Wear protective and clean clothing (glove use)
- Clean labor and care areas
- Dispose of waste safely
- Care for equipment and supplies

How Germs Get into the Body (Cause and Transmission). People get sick when harmful germs that cause infection get inside their body. Germs that cause infection get inside the body in different ways:

- Touching. When you touch something with germs on it, you are contaminated. Now germs are on your hands or gloves. These germs can get into someone else when you touch an opening in their body or a cut on their skin before washing your hands and changing your gloves. The germs do not cause infection until they get into a person's blood, for example tetanus and infection of the uterus can spread this way.

- Blood or body fluids. Some germs live in blood or body fluids. These germs can pass from an infected woman to her baby during pregnancy, birth or after birth; or to her or her partner during sexual contact; or during contact with an open sore, blood transfusion, or sharing needles. HIV, hepatitis B and C, and gonorrhea move from person to person in this way.

- Water and food. Germs that live in food or water pass to people who eat or drink the dirty food or water. Cholera and diarrheal disease spread this way.

- Air. Some germs are coughed, sneezed or breathed into the air by a sick person and passed to others who breathe the air. Colds, flu, and tuberculosis can move from person to person this way.

Prevent Infection by Keeping Germs Away

- Hand washing. Hand washing with plain soap for at least 10-15 seconds followed by rinsing in clean, running water is very effective. Wash your hands before and after wearing gloves and immediately after any contact with blood, body fluids, or mucous membranes. See **Learning Aid 4** for hand washing procedure.

- Hygiene. Encourage women to bathe in early labor. They should wash the genital area with soap and water or antiseptic. Wash from front to back of the genital area until clean.

Antiseptic Solutions Safe for the Skin

Chlorhexidine gluconate (4%) (for example, Hibiclens®, Hibiscrub®, Hibitane®).
Chlorhexidine gluconate and cetrimide, various concentrations (for example, Savlon).
Iodophors, various concentrations (for example, Betadine®).

- For minor surgical procedures, such as manual vacuum aspiration (MVA) or episiotomy repair, use a water based antiseptic solution for vaginal and cervical preparation. **Do not use** alcohol or alcohol containing preparations (such as, Dettol or tincture of iodine). Alcohol burns, dries and irritates mucous membranes, which helps the growth of germs. **Do not use** hexachlorophene (PhisoHex®) as it causes nerve damage and is absorbed by mucous membranes.

- No-Touch Technique. Using the no-touch technique means that gloves, instruments or sutures that enter the cervix, uterus or an open wound will not touch anything before insertion. During vaginal procedures, separate the labia to let the gloved hand have very little contact with the vulva before feeling the cervix or going into the uterus. When repairing an episiotomy, hold the suture in your hand so it does not drag on the linen or the genital area. Midwives and doctors should hold the instruments only by the parts that do not touch the woman. Remember to put your fingers in the vagina or cervix as few times as possible to reduce the risk of contamination and for the comfort of the woman.

Wear Protective and Clean Clothing so germs and infection do not make you sick. You will not be able to help women if you are sick. If you are sick, you can make a woman or baby sick. Take care of yourself. Germs have trouble getting in your body if your skin has no cuts or sores and you protect yourself.

- Protective clothing should be used when giving care including during labor and delivery. It does not have to be expensive but it must be clean. You can wear an apron, a surgical gown or a big shirt to keep fluid off your clothes. You can protect your eyes with goggles or buy a pair of big glasses. Keep something in the delivery room to put on your feet as you go in, and take off as you go out. That way you do not carry germs into the room and you do not carry germs out of the room. Covers for feet may be closed shoes, boots or plastic bags.

- Glove use. Sometimes the recommended type of glove may not be available. If not available, use whatever clean glove is available. If no glove is available, use clean plastic bags to protect your hands.

  Disposable examination gloves can be used for pelvic examination and nonsurgical procedures. Use new examination gloves for each procedure; these gloves can not be used more than one time because they are too thin to be processed.

  Surgical gloves, if available, are used for vaginal deliveries, new gloves are best. If gloves are reused, they must be decontaminated, cleaned, and high-level disinfected (HLD) or sterilized. See **Learning Aid 2**, for information on care of surgical gloves.

  Use cleaning gloves such as heavy utility gloves, disposable examination gloves, or decontaminated, cleaned, HLD surgical gloves for cleaning chores. These chores include decontamination and instrument cleaning procedures. Throw away cracked or torn gloves.

Clean Labor and Care Areas to reduce germs and the risk of contamination, and provide a safe place for health care. When a birth is finished, wash all surfaces and floors. It is important that all staff needing to use the following solutions learn how to make them and know when to use them, see **Learning Aid 7.** The three types of cleaning solutions used for cleaning:

- Plain soap and water (may be called soap solution) is used after decontamination or when there is no blood or body fluids to remove. Locally available detergent and water are used for general cleaning tasks. Detergents remove dirt, organic material, grease, oil and other for easy cleaning by scrubbing.

- Chlorine decontamination solution (may be called disinfectant solution, bleach solution or chlorine solution). Chlorine solution 0.5% rapidly kills 90% of the germs. Chlorine solution makes it safer to clean. It is used to decontaminate surfaces, instruments, and spills of blood or other body fluids. Always wear cleaning gloves when cleaning spills. Wipe up spills with a cloth soaked in chlorine solution. Wipe up spills as soon as possible to prevent accidents. The area is then cleaned with disinfectant cleaning solution. See **Learning Aid 8**, for how to make 0.5% chlorine solution.

- Disinfectant cleaning solution for cleaning areas that may have blood and body fluid contamination such as beds, delivery room, theatres and latrines. Disinfectant cleaning solution has chlorine solution, a detergent, and water. It kills infectious germs fast and removes dirt. To make this cleaning solution, add detergent (or bar soap) to 0.5% chlorine solution until the solution is mildly sudsy.

Dispose of Waste Safely. Get rid of wastes to prevent people from getting sick from germs on the waste materials, see **Learning Aid 5**.

- Body waste is disposed of in a latrine, burned, or buried deep in the ground. Families may want to bury the placenta in a special place. To make placenta safe for families to dispose of in traditional manner, soak placenta in 0.5% chlorine solution for 10 minutes. Give to the family in a water proof container for disposal.

- Sharps. After use, put sharps in a puncture-proof container. Fill the container only ¾ full so sharps are not coming out the top of the container. It is best if the sharps container can be burned. If it is not possible to burn the sharps container, fill the container with 0.5% chlorine solution and bury in a pit. Safe disposal of needles and blades prevent accidental wounds. If you are stuck by a used needle or blade, immediately wash the area where you were stuck with soap and rapidly running water or alcohol. Do not squeeze the wound because it may cause more trauma to the tissue.

- Plastic waste. Use 0.5% chlorine solution to soak plastic gloves, syringes, IV tubing, blood bags or any other plastics for 10 minutes and then bury in a pit. Do not burn plastic wastes. The smoke and ash from burning these is very poisonous.

- Other waste. After a procedure, and while you are still wearing gloves, place other waste like surgical gloves, cotton, gauze and cloth soaked in blood in a leak proof container. Disinfect with 0.5% chlorine solution. Burn in a safe incinerator or bury in the ground.

Care for Equipment and Supplies. All equipment and supplies used at birth, during an exam or a procedure must be clean and high level disinfected or sterile to kill any germs. This reduces the risk of transmitting infection to the woman, the baby and the midwife.

- Linen and bedding. Wash linen and bedding with detergent and water and dry in the sunlight if possible. Heavily soiled linens should be soaked in 0.5% chlorine solution for 10 minutes before washing. Linens used in surgery should also be sterilized (autoclaved). Store all clean linen in a covered area, and sterilized linen in a sterilized container, to keep germs away.

- Processing equipment. The four steps of the **Infection Prevention Method** must be done in the order below so the procedure is safe and germs are all killed. See **Learning Aid 9** for details and *Guidelines for Caregivers* for checklist.

Infection Prevention Method for Processing Equipment and Supplies

Step 1. Decontamination kills germs and viruses including hepatitis and HIV. It makes the equipment safer to handle when cleaning. Soak in 0.5% chlorine solution for 10 minutes. Always wear cleaning gloves for this step.

Step 2. Cleaning includes washing with soap water and rinsing with clean water to remove blood, dirt and other materials. Wash items with brush, soap and under the water to prevent splashing. Rinse off all of the soap. Cleaning improves the effectiveness of the third step. Always wear cleaning gloves for this step.

Step 3. High-Level Disinfection (HLD) or **Sterilization** is used to destroy endospores and microorganisms. All the procedures in the *Life – Saving Skills Manual for Midwives* can be done safely with equipment that is either HLD or sterilized.

- **HLD** kills all viruses, bacteria, parasites, fungi, and some endospores. Boiling and steaming for 20 minutes are the simplest and most reliable HLD methods. Some chemical disinfectants may be used for HLD, see **Learning Aid 10**. See **Learning Aid 2** for HLD by Steam.
- **Sterilization** destroys all microorganisms and endospores. The most common methods are using wet heat (autoclave) and dry heat (oven). Sterilization is the best method for surgical equipment in hospitals, **Learning Aid 3**.

Step 4. Storage of HLD or sterilized equipment is as important as the other steps of decontamination, cleaning and HLD/sterilization. Keep storage area clean, dry and dust-free. Do not store anything in solutions. Germs can live and grow in antiseptic and disinfectant solutions,

Review Questions

What Did I Learn? Find what you know and understand from this section. Answer the following questions. When you are finished, look for the answer in the module on the page written in parentheses ( ).

1. When and how should a midwife wash her hands (page 7.7 and Learning Aid 4)?

2. How will you do each of these infection prevention steps (page 7.10)?

   Decontamination

   Cleaning

   High level disinfection

   Storage

INFECTIONS IN WOMEN

Remember that infection can lead to death. Even with treatment, infections may cause serious long term problems such as infertility and chronic pain.

Infection happens any time bacteria germs go into the body of a woman. Infection is a very serious risk during a miscarriage, while in labor and after delivery. The cervix is open during those times making it easy for germs to enter through the cervix. Tissue in the uterus from products of conception with an abortion or stillbirth can cause infection. A woman with an infection in the uterus is in serious danger. The infection can spread into the blood (septicemia). Prevent infection of the uterus: rupture membranes as close to delivery as possible, do as few vaginal examinations as needed and use sterile technique when doing these procedures. Keep the birth surface clean, the woman's perineum clean, and do not use any contaminated instruments or supplies. Infection of the breast (mastitis) if not treated correctly, makes a place for bacteria to grow in the blocked milk duct. An abscess can develop. A breast abscess is dangerous for the baby and the woman. Prevent mastitis with good breast feeding methods. Prevent breast abscess with correct treatment of mastitis.

You can treat some infections with antibiotics. Broad spectrum antibiotics that kill bacteria will help the woman get better. Infections such as HIV and malaria need other treatment. Increased fluid intake helps lower the fever. Surgery may be needed to empty the uterus or drain abscesses. Serious cases of infection must be referred to a doctor or hospital. The midwife should help arrange transport and go with the woman and baby. It is very important infections be treated as soon as possible. Advise all pregnant women to come to you for treatment as soon as they have any fluid (leaking or ruptured membranes), discharge (sexually transmitted infections), or bleeding from their genital tract (birth canal). Help them to understand they and their babies can get very sick if they delay seeking care.

Use Problem Solving Method to Find the Cause of the Infection

When you first see a woman with signs of infection, quickly decide how sick she is. When a woman comes to you and says she is pregnant, in labor or has delivered and has signs of infection (fever, pain, bleeding, vaginal drainage, other), take action right away. This may be a life threatening emergency. Talk to the woman and family as you find out what is wrong. Help them feel you are trying to make the situation better. Try to look calm and show that you know what you are doing. This will help the woman be less afraid. Have one member of the family stand beside the woman if possible.

You must make sure to treat or prevent shock, see Module 8. Find out if the woman is alive and at the same time call for help to provide care.

ASK and LISTEN – Take a History

This is the first step of the problem solving method when a woman and her family come to you with a problem, see Module 1: **Introduction**. If the woman looks very sick, quickly decide if she is in shock. Make sure the woman is alive – LOOK and FEEL as you ask questions. You may need to ask questions to the family if the woman is very weak or unable to answer. Ask about the reason she came to see you. Listen carefully to all the answers.

- When did the problem start?
- How long have you been pregnant?
- When did your labor start?
- When did you deliver?
- Are you bleeding?

LOOK and FEEL – Do a Physical Examination

This is the second step done when seeing a woman (or her baby) with a problem. LOOK and FEEL for open airway, breathing, heart beating, signs of shock and any bleeding.

A – **Airway.** Is the airway open? Can the woman talk? If the woman can not talk, make sure the mouth and nose are clear and open. Lay the woman on one side with head tilted back to keep the airway open.

B – **Breathing.** Is the woman breathing? If the woman is not breathing, help her to breathe, see Module 6: **Resuscitation**.

C – **Circulation.** Is the heart beating? If the heart is not beating, help the heart beat, see Module 6: **Resuscitation**.

S – **Shock.** Is the woman in shock?

- If signs or symptoms of shock, keep the woman warm, put in shock position, and give fluids, see Module 8: **Stabilize and Refer**.
- If no signs or symptoms of shock, examine the areas of her body with the problem.

Shock Signs or Symptoms

Eyes	Dull
Breathing	Fast, shallow
Pulse	Weak, fast
Skin	Cold, clammy
BP	Low
GI	Nausea, vomiting, thirst
CNS	Anxious, restless, weak
Late Signs	Confused, low urine output

IDENTIFY PROBLEMS

This is the third step of the Problem Solving Method. Use information from the ASK and LISTEN and the LOOK and FEEL, your knowledge, experience, information in this manual and the *Guide for Caregivers - Complaint and Findings section* to compare information and identify the problems and needs.

If there is shock, manage the shock and then identify the cause of the shock.

If there is no shock, or after you have treated the woman for the emergency and she is stable (BP above 90/60, pulse lower and respirations lower and regular, skin warm and dry), use the problem solving process to identify the problem(s) and needs.

TAKE APPROPRIATE ACTION

This is the fourth step of the Problem Solving Method. You must decide what should be done to solve each problem or meet each need. Sometimes emergency or shock treatment will be needed immediately. For example, when a woman is not breathing, you must help her breathe before asking how long she has been sick. Once she is breathing, you may continue the problem solving process.

If there is shock.

- Keep the woman warm. Cover her. A low body temperature can make the shock worse.
- Put in shock position. Raise a woman's feet and legs higher than her heart. Keep calm. Handle gently as body movement can make shock signs stronger (faster pulse, lower blood pressure). Reassure the woman and her family as you are giving care.
- Give fluids. Do not wait as severe shock usually ends in death. For a woman, start IV fluids. If you do not have IV fluids or if you can not start the IV, fluids can be given to the woman in the rectum or intraperitoneal, see Module 8: **Stabilize and Refer**.
- Identify the cause. Shock can have many different causes. You must identify the cause and manage the problem to prevent the condition from becoming worse. For example if the woman is bleeding, stop the bleeding. See Module 5: **Hemorrhage**.

If there is no shock, or after you have treated the woman for the emergency and she is stable see the next pages for discussions of the most common infection problems and refer to *Guide for Caregivers: Protocols* to manage these problems.

EVALUATION AND REPEAT PROCESS

This is the fifth step of the Problem Solving Method. Follow-up visits are important to see if a previous problem is solved, staying the same, or getting worse. You will need to repeat the problem solving method. She may need more information or a different medication or treatment. She may need to be referred to a hospital or doctor.

Problem: Infection Associated With Abortion

The two most dangerous problems that women can have with an abortion are infection and hemorrhage. Hemorrhage happens when tissue from the pregnancy is still in the uterus; the uterus or birth canal has been cut or torn; or the uterus is infected. Infection happens when tissue from the pregnancy is still inside the uterus or germs get into the uterus during the abortion. This can happen when something *not sterile* is put in the uterus or birth canal. **Unsafe abortions and complications of unsafe abortion are responsible for about 5% of all maternal deaths worldwide. In some parts of the world, more than 33% of all maternal deaths are associated with unsafe abortions**, see Module 5: **Hemorrhage** for more information.

Findings. The woman has fever of more than 38°C (100.4°F) for 24 hours or more, weak and fast pulse (above 100 beats per minute), feeling chills, complete or incomplete passing of pregnancy tissue, fetus is not viable (not able to live outside of the uterus), usually less than 24 weeks gestation (weeks vary in different areas – use local definition), uterine tenderness, lower abdominal pain, and foul smelling vaginal discharge. The cervix may be open, closed, or torn. There may or may not be vaginal bleeding.

Actions. The woman is very sick. Ask someone to find emergency transport and go with her to the hospital or doctor. Surgery may be needed. While you are waiting:

- Lower the fever by giving fluids and a sponge bath. Refer to Module 8: **Stabilize and Refer** for information on how to hydrate the woman. If there is malaria in your area, treat for malaria.

- Give an oxytocic to help the uterus contract.

- Give broad spectrum antibiotics.

- Remove any tissue in the cervix or uterus. The infection will not improve until the tissue is removed. Use sterile technique when doing this necessary vaginal procedure. Refer to Module 5: **Hemorrhage** for information on removing tissue which may be left in the cervix or uterus.

- Prevent tetanus infection, see page 7.32 for tetanus prevention information.

- It is very important that you go with the woman to the doctor or hospital. You must check her vital signs and watch for shock and bleeding. Refer to Module 8: **Stabilize and Refer** for shock information. You can also help the woman and family to stay calm during the trip.

Prevention. Women need good health care services, near to them and not costly. This will help prevent loss of life and long term sickness in women. When a woman loses a pregnancy, she has a difficult experience both physically and emotionally. Getting pregnant too soon after giving birth to a baby, or having too many children, can cause a woman to become sick or die. She may not be strong enough to carry the pregnancy and may lose the baby (spontaneous abortion). The woman is at risk for an infection, bleeding and anemia. Infection can be treated to prevent death, but sometimes that infection can cause chronic pelvic infection, future ectopic pregnancy, or infertility. Until the woman's body is ready, the woman and her partner can prevent pregnancy by using family planning methods. See Module 10: **Postpartum** for child spacing methods and how to use them.

- Teach women and their partners about planning for pregnancy to prevent an unplanned or unwanted pregnancy.

- Share child spacing and pregnancy prevention information with all women, even if you, personally, feel the woman should not have it (too young, not married). If this is difficult for you to do, find another midwife or person who is willing to do this.

- Teach people in the community about family planning and reproductive health.

  Give health education and counseling about human reproduction and family planning methods – to use condoms and other contraceptives, and how to prevent HIV transmission.

  Advise all women to come to you immediately if they see any unusual vaginal bleeding or discharge.

  Show and tell women about ways to protect themselves and their babies from infection and anemia.

  Teach women that it is important to keep their bodies, clothing, and surroundings clean to prevent sickness.

REMEMBER

A woman treated for an abortion will be at risk for getting pregnant again almost immediately:
As early as 10 days after the abortion, if the pregnancy was less than 12 weeks;
And by 4 weeks after the abortion if the pregnancy was 12 weeks or more.

There are safe contraceptive methods a woman and her partner
can use immediately to avoid pregnancy.

A woman should be told where and how to get family planning services.

Problem: Chorioamnionitis (Inflammation of the Amniotic Sac)

At the end of pregnancy and during labor, the cervix is open to the uterus. Sometimes bacteria or germs may go into the uterus during a long labor or when the fetus has died late in pregnancy. The bacteria infect the fetus and the woman more easily when membranes are ruptured. Infection may spread faster when the woman is HIV positive.

Findings. If the membranes are ruptured and the fetus has a fast heart beat (above 160 per minute), this may be the first sign of intrauterine infection. The fetus will be very sick and may die. The woman has fever, rising pulse (above 90 per minute), foul smelling and blood stained vaginal discharge, and a tender uterus.

Actions. The woman must get to the doctor or hospital as quickly as possible. The woman and her baby are both in danger of dying. Delivery should take place as soon as possible. The baby will be sick and may need resuscitation.

- Ask someone to get transportation immediately.
- Be ready to resuscitate the baby.
- Be prepared for a delivery.
- LOOK for shock while you wait for transport, and on the way to the doctor.
- Lower the fever by giving fluids: oral, intravenous (IV) or rectal. Give a sponge bath. If there is malaria in your area, treat for malaria.
- Give broad spectrum antibiotics. See *Guide for Caregivers – Protocols & Formulary*.

Prevention. Intrauterine infection (chorioamnionitis) is very dangerous and must be prevented if possible. Infection is more dangerous to the woman if the fetus is dead. Early rupture of the membranes, before regular contractions start, happens more often when the woman is HIV positive. The infection can go to the placenta, the baby, and the woman. Do only necessary vaginal examinations using sterile technique.

Advise all pregnant women to come to you for treatment as soon as they have any fluid (leaking or ruptured membranes) or discharge from their genital tract (birth canal). Help them to understand they and their babies can get very sick if they delay.

Problem: Postpartum Infection (Puerperal Sepsis)

Postpartum infection is infection of any part of the birth canal, any time between rupture of the membranes and the 42nd postpartum day. When bacteria get into the genitals or birth canal they can cause infection. A woman who has just delivered has an open uterus. The uterus could become infected if she is not cared for correctly. The infection may stay in the wall of her uterus. It may go to the pelvis and cause a pelvic abscess. It may go to her peritoneal cavity and cause peritonitis. It may go to her blood stream and cause septicemia. If the infection does not heal completely, it may block the tubes and make the woman infertile.

Findings. The woman has ruptured membranes, delivered a baby or had an abortion or miscarriage and has fever. **Postpartum fever is never normal.** She has a fast pulse (above 100 per minute). She has lower abdominal pain with uterine tenderness and foul smelling, blood tinged, sometimes purulent (pus) vaginal discharge. The woman may have chills and look very sick.

Actions.

- Find someone to get transport and go with her and her family to the doctor as soon as possible.

- Position. While waiting for transport, **if she is not in shock,** help her rest in a half-seated position. Keep her in a half-sitting position to help drain discharge from the uterus and vagina.

- Give a broad spectrum antibiotic.

- Lower her fever and hydrate her by giving at least one glass (8 ounces) of water or other liquid every hour. She may not be able to drink this much water if she is too sick. If she can not take this much fluid by mouth or if she is vomiting, start IV fluids. If you do not have IV fluids, give rectal fluids. See Module 8: **Stabilize and Refer.**

- LOOK for shock as you take the woman to the doctor. Remember, untreated postpartum infection can spread from the uterus into the abdomen. An abscess may form in the abdomen. The infection may go into the bloodstream, causing septic shock (shock due to infection) and death.

REMEMBER

Untreated postpartum infection can cause septic shock and result in death.

Prevention. Postpartum infection may start with the premature (early) rupture of membranes, during prolonged or traumatic delivery, or after the delivery. Remember cleanliness and hand washing prevent infection.

Teach others about germs and infection. Explain why this is important.

- A pregnant or laboring woman must be clean. Encourage her to bathe when labor starts. Cleanliness and hand washing prevent infection.

- All persons caring for a woman during labor and after the baby is born must be clean and wash their hands often.

- All equipment, materials and the place used for delivering a woman must be very, very clean.

- Women should clean themselves after using the latrine. Women should always wipe (clean) themselves from front to the back after using the latrine, so that they do not bring germs from the anus to the vagina and urethra. Daily washing of the vulva and perineum during pregnancy, labor, and postpartum keeps germs further away from the vagina and cervix.

REMEMBER

Postpartum fever is never normal.

Problem: Mastitis

Breast infection and breast abscess can lead to septicemia. Treat them right away. Infection of the breast must be treated to prevent breast abscess. A breast abscess is a serious infection in the breast.

Breast infection may be caused by:

- Milk staying in the breast (stasis).
- The breast not completely emptying after nursing.
- Bruising of breast tissue with poor technique for expressing milk.
- Germs growing in the breast.
- Having a cracked nipple where germs get into the breast.

Findings. Fever is slight at first, but may increase to 104°F (40°C). The woman may have increased pulse (above 100 beats per minute), chills, headache, and body aches and pains. The breast pain is usually in only one breast and the infected area of breast is hard, hot, red, swollen and **very** tender. She may have tender lymph nodes under her arm.

Actions. Prevent breast abscess by early treatment of breast infection, see *Guide for Caregivers – Breast Feeding Counseling.*

- Prevent breast infection by removing all the breast milk - emptying the breast with each feeding.

- Give broad spectrum antibiotic. See *Guide for Caregivers – Protocols & Formulary*.

- Compresses. Apply wet, warm compresses to the painful breast 15 minutes before each feeding to help the milk flow.

- Manage pain. Give analgesic and put ice or cool cloths (fresh cabbage leaves are used in some places) on the area, 30 minutes 4 times a day to reduce pain for as long as needed.

- Support breasts with a loose fitting brassiere or sling.

- If breast feeding is too painful in the infected breast, wait 12-24 hours after beginning antibiotic treatment and try breast feeding again. Explain to the woman the breast milk from the infected breast will not hurt the baby and the breast will get better once the breast milk is removed.

- Manage the abscess. If she has a high fever for 48 hours and a soft yellow center area of the breast that shows the location of a pus filled abscess, drain out the pus. Refer to **Learning Aid 6** – Incision and Drainage of Breast Abscess.

Prevention is the best treatment for a breast infection, see *Guide for Caregivers – Breast Feeding Counseling*.

- Breast Feeding. Teach the woman to feed her baby when the baby wants to feed and when the woman feels a need to feed. This is demand feeding. Babies may not feed at regular times. They may feed very often for a day or two or they may take only a few feeds each day for a few days. Every baby is different, but most find their own routine after a week or two. Frequent sucking stimulates the production of prolactin, which helps the milk to come in sooner. Demand feeding prevents engorgement (breast too full, causing pain), and helps the breasts to empty. Proper positioning of the baby when breast feeding prevents sore and cracked nipples.

- Good hygiene. Prevent breast infection by very good hand washing with soap, and good breast care including gentleness, and cleanliness: wash nipple with clean water, wear clean clothes, and spread breast milk on the nipples after nursing. The breasts need good support, but not tight or binding clothing. Prevent contamination of the nipples when the baby has an infection such as eye infection, cord infection, or skin infection. See Module 10: **Postpartum** for more information.

A Midwife's Experience...

The woman was a 29 year old gravida 4. My friend. She came to my house at 3 AM. As soon as I saw her, I remembered that she had delivered just 3 weeks ago on the first day of Ramadan. Labor and delivery were normal. I could see the pain she was suffering was terrible. She did not talk, only opened her dress and showed me her left breast.

Her breast was very swollen and red. There was a soft yellow center. I gave analgesic for pain, antibiotics and applied a wet, warm compress. I fixed her some tea with sugar and tried to reassure her.

After 30 minutes, I drained 600 cc of pus from her breast. The drain was left in the incision, dressing applied, and the baby put to breast. I reassured the woman the pain will get less. I asked that she return the next evening for me to change her dressing and so I could make sure the baby is getting enough breast milk. I remembered that a cause of child death is poor maternal health. I must help this woman get well so she can continue to provide food security and protection against illness through exclusive breast feeding of her baby.

LSS Co-author, Lesotho

Problem: Thrombophlebitis

Hormonal changes during pregnancy may cause the blood vessels to relax. Then the blood may not move well through the vessels, causing blood clots to form or infection to start in the blood vessels. Thrombophlebitis is caused by clots in small veins under the woman's skin. Blood sometimes clots in the deeper veins of her legs. This is dangerous because the clots can become loose and go to her lungs. This usually causes the woman to die.

Findings. Mild fever, pain, tenderness, or feeling warm in the lower leg or thigh. There can be swelling of the leg, and pain in the area of the clot or infection when the foot is flexed upward (Homan's sign).

Actions. Help the woman get to the doctor or hospital. Give aspirin, 500mg, to help with the pain and decrease the chances of clots (thrombosis). Wrap the entire leg with a bandage or cloth. Start wrapping around the foot and wrap all of the way to the groin using even pressure to give a little support to the veins. Hot compresses may help if referral is delayed. **Do not wrap too tightly as this may cause edema or stop circulation.**

Prevention. Teach and encourage the woman to walk and move around during pregnancy, labor and postpartum. Advise her to put her feet up when sitting. The midwife should prevent exhaustion, dehydration, and hemorrhage of the woman in labor which may cause circulatory problems. If stirrups are necessary during delivery, prevent pressure and bruising on legs. Encourage the woman to get up and walk as soon as she can after the baby is born.

Problem: Upper Respiratory Infection

An upper respiratory infection (common cold) is usually caused by a virus and is contagious. **Antibiotics will not help a common cold caused by a virus.**

Findings. Headache, fever, nonproductive (dry) cough, sore throat, and runny nose.

Actions. Paracetamol or Tylenol and cough mix will help the woman feel better. Encourage her to drink plenty of liquids. If her cough is productive with purulent (yellow or green) sputum, antibiotics may be needed. See *Guide for Caregivers – Protocols & Formulary.*

Prevention. The woman may continue to breast feed with little risk to her baby. The woman should wash her hands with soap and water before holding her baby. If the midwife or anyone has a cold, sore throat, cough, fever, or flu, they should try to stay away from the birth and the baby, and wash their hands often.

Problem: Urinary Tract Infection

Infection of the urinary tract is usually caused by germs from outside the body going into the urethra. Catheterization increases the risk of infection. If bacteria are in the bladder, the woman has cystitis. If the bacteria reach the kidneys, it is pyelonephritis (kidney infection) Many times the whole urinary tract is infected from the urethra to the kidneys.

Findings. Frequency and pain when passing urine is usually a symptom of infection in the bladder (cystitis). Symptoms for kidney infection are: fever, rigors (shivers or chills), lower abdominal pain and tenderness, tenderness over the kidneys, frequent, painful urination, and passing urine at night. It is much more serious than cystitis. The risk of urinary infections is higher during pregnancy than other times. Urinary infections are dangerous for the woman and can cause her to start labor too early if infection is not treated. Itching or burning while urinating can also be a sign of infection of the vagina or a sexually transmitted infection. See *Guide for Caregivers – Complaint & Findings* for more information.

Actions.

- Start broad spectrum antibiotic as outlined in the *Guide for Caregivers – Protocols & Formulary*.

- Have the woman drink one glass (8 ounces) of water or other fluid at least 8 times in 24 hours to wash the bacteria and pus out of the bladder.

- Advise the woman to empty her bladder every 2 hours.

- Alkaline urine will reduce painful urination. Give the woman 1 tsp baking soda in a glass of water, three times a day.

- If she does not start to feel much better in 1 - 2 days or if she is very ill, refer her to the doctor or hospital.

Prevention. Teach women the importance of good perineal care, showing them the correct way to wipe after toileting. Women should always wipe (clean) themselves from front to the back after using the toilet, so that they do not bring germs from the anus to the urethra.

Avoid catheterization unless very necessary. If catheterization is necessary, use aseptic technique.

Problem: Malaria

Globally around 50 million women living in malaria-endemic areas become pregnant each year. Up to **200,000 newborns die each year as a result of malaria.** The sickness is caused by the bite of an Anopheles mosquito that is carrying malaria. Malaria can infect the placenta of a pregnant woman and pass to the baby. If treatment is not available or the parasites are resistant to the treatment, malaria in pregnancy may cause spontaneous abortions, stillbirth, low birth weight, and maternal anemia. It attacks and destroys red blood cells, causing anemia. Malaria infected red blood cells can clog the capillaries that carry blood to the brain (cerebral malaria) causing death.

Findings. Chills, sweating, high fever (104°F or 40°C), headache, or flu-like symptoms. Malaria may occur without symptoms. Malaria, without fever and chills, often causes anemia in the pregnant woman.

Actions. The World Health Organization strategy recommends prompt and effective management (treatment) of women with malaria in areas where there is malaria. The recommended antimalarial for treatment of malaria is chloroquine (CQ) in CQ sensitive areas and sulfadoxine-pyrimethamine (SP) in areas with CQ resistance. Quinine is used in areas where CQ and SP do not work well. Quinine may be used anytime during pregnancy and is recommended for severe malaria. The **following drugs are not used during pregnancy**: halofantrine, tetracycline, doxycycline and primaquine.

Make sure the malaria treatment protocol you use is up to date. Every year more studies give new information on the treatment of malaria. If there is no improvement after 24 hours, help the woman to go to the doctor or hospital. She may have a resistant type of malaria. She may need a different medicine. See *Guide for Caregivers – Protocol & Formulary*

Prevention. Malaria prevention is very important during pregnancy, labor, and postpartum. Teach all pregnant women and their families the importance of preventing malaria. The WHO strategy recommends use of **insecticide-treated bed nets** (ITNs) by pregnant women and newborns. It recommends **intermittent preventive treatment** (IPT) of women two times during pregnancy after the first trimester. Give the medicines to them yourself and watch the women take it when they come for a regular antenatal visit. In communities where more than 85% of the homes are **inside residual sprayed** (IRS), there is a decrease of malaria in pregnancy. Refer to your country's malaria policy.

Teach people in the community to stay in well screened areas, use insecticide-treated bed nets when sleeping and residual spray their homes. If they must be outside at night, they should wear clothes to cover the body for protection from night feeding mosquitoes. It is important to know the biting patterns of mosquitoes in your area. Health care providers can set an example by using bed nets (ITN) and spray (IRS).

INFECTIONS IN BABIES

The death of a child is a too common experience for millions of parents. Each year globally, 4 million babies die within the first month of life and 4 million are stillborn. Many of the newborn deaths during the 4 weeks following birth are caused by or related to infections. Most germs do not get to the baby while he is protected by the bag of waters in the uterus. Germs may get in to the baby if the membranes break many hours before birth or when vaginal exams are done when membranes are ruptured. Some germs such as malaria cross the placenta to the baby. Germs get to the baby during and after birth. After the germs get to the baby, the germs need a day or two to grow. **Newborn sepsis is most common after the second day through the first month of life.** The midwife can save the life of a baby through early identification, correct action, and use of the steps for preventing infection. It is important that the midwife, another skilled attendant, community health worker or family member see the newborn in the first two to three days of life to LOOK for signs of infection and to make sure the baby is breast feeding, see Module 10: **Postpartum Care.**

Use Problem Solving Method to Find the Cause of Infection

Talk to the woman as you are caring for the baby. Help her understand the baby's condition and that you are trying to make the baby feel better. If possible, have one member of the family stay with the woman. Follow these steps of the Problem Solving Method.

ASK and LISTEN – Take a History

This is the first step of the Problem Solving Method when a woman and her family bring their sick newborn baby to you, greet mother and family. Tell them you are going to help the baby. Explain that you will ask some questions and do an examination to decide how to help and take care of the baby. **Do not waste time.** You do not know how long the baby has been sick before seeing him. He may be close to shock. LOOK and FEEL as you ask questions. Listen carefully to all the answers.

- Why have you come or what is wrong with your baby?
- When did the problem start?
- When was the baby born? Did he cry or breathe right away?
- Is he sucking the breast?
- Did the woman have any problems at birth such as membranes ruptured for a long time, prolonged labor, infection or hemorrhage?
- Was the woman sick or have any problems during the pregnancy?

LOOK and FEEL – Do a Physical Examination

This is the second step of the Problem Solving Method when seeing a baby with a problem. LOOK and FEEL for open airway, breathing, heart beating, signs of shock and sucking reflex. The mother or family may say the baby is not sucking and / or the baby feels cold or hot.

A – **Airway.** Is the airway open? Is the baby crying? If the baby is not crying, make sure the mouth and nose are clear and open. Lay the baby in the sniffing position to keep the airway open.

B – **Breathing.** Is the baby breathing? If the baby is not breathing, help him to breathe, see Module 6: **Resuscitation**.

C – **Circulation.** Is the heart beating? If the heart is not beating, help the heart to beat, see Module 6: **Resuscitation.**

S – **Shock.** Is the baby in shock?

Shock Signs or Symptoms

Eyes	Dull
Breathing	Fast, shallow, irregular
Pulse	Weak, fast
Skin	Cold or hot
CNS (brain)	Restless, weak, sleepy

IDENTIFY PROBLEMS

This is the third step of the Problem Solving Method. Using information from the **ASK and LISTEN** and the **LOOK and FEEL**, decide the problems and needs.

- **If there is shock,** manage the shock and then identify the cause of the shock. Keep the baby warm, put in sniffing position, and give fluids, see Module 8: **Stabilize and Refer**, and *Guide for Caregivers – Emergency Treatment.*

- **If there is no shock,** or after you have treated the baby for the emergency and he is stable (pulse lower and respirations regular, skin warm and dry, response to stimuli, tries to suck), examine the areas of the body with the problem. Use the steps of the Problem Solving Method to identify the problem(s) and needs.

TAKE APPROPRIATE ACTION

This is the fourth step of the Problem Solving Method. You must decide what should be done to solve each problem or meet each need. Sometimes emergency treatment for shock will be needed immediately. For example, when a baby is not breathing, you must help him breathe before asking how long he has been sick. Once he is breathing, you may continue the problem solving process.

If there is shock.

- Keep the baby warm. If possible, put baby skin to skin with the mother as shock can cause the body temperature to drop very low and make the shock worse. Reassure the woman and her family as you are giving the baby care.

- Give fluids. Do not wait. Severe shock usually ends in death. For a newborn baby, give expressed breast milk with a cup. Give fluids with a nasogastric feeding tube if the baby can now swallow. If you do not have nasogastric feeding tube, start IV fluids. See Module 8: **Stabilize and Refer**.

- Identify the cause. Shock can have many different causes. You must identify the cause and manage the problem to prevent the condition from becoming worse. For example, if the baby is bleeding from the cord stump, stop the bleeding. .

If there is no shock, or after you have treated the baby for the emergency and he is stable, see the next pages for discussions of the most common infection problems and refer to *Guide for Caregivers - Protocols* to manage these problems.

REMEMBER

Shock, not breathing, not sucking are emergencies in the baby.

Problem: Eye Infections (Ophthalmia Neonatorum)

Ophthalmia neonatorum is an infection of the eyes caused by several kinds of germs, including Chlamydia and gonococcus. The most dangerous is gonococcus, because it can cause blindness. A pregnant woman with gonorrhea (caused by gonococcus infection) or Chlamydia can infect her baby during the birth.

Findings. Thick, greenish, yellowish discharge usually in both eyes of the baby; eyelids may be swollen and red during the first days of life. When redness and swelling of the eyes is seen later or is only in one eye, it is usually not caused by Chlamydia or gonococcus.

Actions.

- Wash eyes. Boil one half liter (500 cubic centimeters [cc]) of water with a pinch of salt if available. Cool the solution. Fill a syringe with solution to wash the baby's eyes. Wash eyes from the nose outward toward the ear. Wash eyes until all of the discharge is gone. Wipe eyes with dry cotton or gauze. Do this every 15 minutes for the first hour and then every hour for the first 24 hours. Frequent washing is needed because discharge washes out the eye medicine quickly. After the first 24 hours, continue to wash the eyes 3 times a day for 3 days or more, until the eyes are normal.

- Put antibiotic eye drops or ointment in both eyes after each washing. **Never use eye medications that contain steroids as this can cause blindness in the baby.**

- Give broad spectrum antibiotic IM. See *Guide for Caregivers – Protocols & Formulary*.

- Check the mother and father of the baby for gonorrhea infection, and treat according to your country's protocols.

Prevention. Routine use of antibiotic ointment such as erythromycin or tetracycline will prevent ophthalmia neonatorum. Put ointment into each of the baby's eyes after delivery. Silver nitrate 1% may be used if antibiotic eye ointments are not available. Many genital tract infections can be prevented by teaching women about risks of sexually transmitted infections (STIs) in pregnancy and birth, signs of STIs, use of condoms and personal hygiene. Some women may feel uncomfortable talking about STIs. You can talk with them during antenatal visits, women's group meetings and individually. It is important to talk with men too so they understand the risks of STIs for pregnant women and babies. Teach women, their family and friends about the importance of care during pregnancy so that all sickness can be treated before delivery.

REMEMBER

It takes much time and care of the baby to prevent life-long blindness.
Remember to wash your hands before and after taking care of the baby.

Problem: Sepsis – Septicemia, Pneumonia, Cord Infection, Meningitis, Skin Infection

Septicemia is an infection of the whole baby. The infection is caused by germs in the blood. The germs may enter the baby if membranes rupture too early, through the umbilical cord or respiratory tract, or after an unclean circumcision or scarification. The germs may enter the baby from an untreated infection such as a cord infection. The baby may become very sick and may die. See *Guide for Caregivers – Complaint & Findings and Protocols*

Findings. The mother may say the baby is not sucking well, has been vomiting or coughing, or just looks sick. The temperature may be above or below normal. The baby may be limp, sleepy, or irritable. He may have pus in the skin (pyoderma), jaundice, grayish skin color, or convulsions. The cord may be smelly and draining pus. The circumcision or scarification may be swollen and draining pus.

Actions. See *Guide for Caregivers - Protocols* for management of cord infection (omphalitis), lung infection (pneumonia), brain infection (meningitis), skin infection (pyoderma).

- Explain to the family the baby is very sick and needs a doctor's care. Ask someone to get transport right away.
- Give broad spectrum antibiotics right away, see *Guide for Caregivers - Formulary*.
- Maintain the temperature. Babies with sepsis usually have trouble keeping warm. Keep baby warm if temperature is below normal. Give sponge bath if fever. Encourage the woman to carry baby skin to skin, see Module 10: **Postpartum.** .
- Continue to feed the baby. If the baby is too weak to suck, help the mother express her breast milk. Give the milk with a cup, see Module 10: **Postpartum**. If the baby can not take the milk from a cup, use a nasogastric feeding tube, see Module 8: **Stabilize and Refer**.
- Go with the family to the doctor or hospital.

Prevention. Sepsis is caused by germs that get in the baby.

- Limit vaginal examinations.
- Follow infection prevention precautions for woman, the midwife and her equipment for tying and cutting the cord. Teach prevention of infection for circumcisions and scarification done in your area.
- Delay baby's first bath for 24 hours. Prevent infection and give cord care with chlorhexidine bath, if available. Chlorhexidine reduces germs and infection of the cord stump. If no chlorhexidine and there is a practice of putting "cow dung or other mixtures" on the cord, teach the woman it is best to keep the cord clean and dry. Clean the cord stump with soap and water (Mullany, 2006).
- Continue to watch the low birth weight baby, those with difficult delivery, and those whose membranes ruptured early for signs of infection.
- Teach woman and her family newborn danger signs. Advise them to come to the health facility right away when they see a danger sign.

Problem: Malaria

In areas which have malaria all year, adults become partially immune. An immune mother can give her newborn baby a natural passive immunity. This protects the baby for the first three months of life. The immunity soon becomes weaker and then it is gone. Between the ages of 3 months to 5 years a child will have many malaria attacks, become anemic and may die. The newborn should sleep under an **insecticide-treated bed net** (ITNs) with his mother or alone. In areas where malaria is occasional or seasonal, the baby usually does not receive passive immunity and must be carefully protected from mosquitoes after birth. Early and correct treatment is important when there are signs of malaria, see malaria section in this module and *Guide for Caregivers – Protocols.*

Problem: Diarrhea

A baby's first bowel movements are green-black and are called meconium. During the next few days, they become soft, yellow, and sour smelling. The stools of a healthy breast fed baby are sometimes very soft and runny, and passed most times when the baby breast feeds. A bottle-fed baby usually has harder stools. Diarrhea is frequent watery stool usually causing dehydration. Dehydration is very dangerous in a newborn baby.

Findings. Watery, green, bloody, or explosive stools more than 6 times a day.

Action. Usually enough breast milk to prevent dehydration will manage diarrhea in a newborn. Continue to breast feed and give small amounts of oral rehydration solution (ORS) as described in Module 8: **Stabilize and Refer**. If vomiting, give breast milk often in small amounts with ORS. If unable to suck, give expressed breast milk. If diarrhea continues for 24 hours, check to see if the baby is dehydrated. Treat dehydration with ORS and expressed breast milk by nasogastric feeding tube or with intravenous solution if you are trained to do so. Go with the family to the doctor or hospital for care. See *Guide for Caregivers – Protocols.*

Prevention. There are many causes of diarrhea. Poor hygiene by those caring for the baby (such as no or little hand washing or unclean feeding practices), is the most common cause during the first 4 weeks of life. Prevent diarrhea by teaching women to breast feed and to wash their hands before and after caring for their baby. If breast feeding is not possible, help find a wet nurse if the family agrees. The wet nurse must be tested for HIV. Use a cleaned with boiled water to feed expressed breast milk to the baby. It may be difficult to have clean water and boiled feeding utensils. Bottles and nipples must be cleaned and rinsed with boiled water after each use. Unclean bottles and nipples are very dangerous to use for a baby's feeding. Prevent infections by teaching hand washing and clean baby feeding and care practices.

Problem: Postpartum Tetanus in Baby and Mother

Postpartum tetanus is an infection of the baby (tetanus neonatorum) or the woman. The tetanus germs get into the baby usually through the umbilicus, circumcision, scarification, or ear piercing. Tetanus almost always comes from the use of unclean instruments or gloves when cutting the cord, from unclean herbs, or using cow dung to dress the cord.

The tetanus germs get into the woman most commonly through the genital tract. Tetanus is more likely to happen when a woman is delivered or cared for in an unclean place. The woman may get tetanus when unclean hands or gloves, cloths, herbs, or instruments are put into the genital tract.

Findings. The mother usually says the baby can not suck at 5 -10 days old. Spasms start within 36 hours of not sucking and stiffness spreads to all body muscles. The baby has generalized muscle spasms, stiffness of the neck and jaw and is not able to swallow. **The most common complaint is stiffness in the jaw (lockjaw) for both woman and baby.**

Actions. The most important action is to prevent tetanus by giving every pregnant woman tetanus toxoid immunization. This protects the woman and the baby from tetanus infection. See *Guide for Caregivers – Protocols & Formulary.*

1. Ask someone to find transport and go with the woman, baby and family to the doctor or hospital right away.

2. Sedate the woman or baby with tetanus, while waiting for transport to lower the chance of tetanus convulsions. Give the sedation to lower the chance of continuous convulsions (tetany). Convulsions may not stop; they will just be fewer or not as strong. **Remember that light or touching and moving of the person may cause more convulsions.** Keep the airway open and keep the person turned to the side so fluids in the mouth will run out and not cause choking.

   - First dose for baby: diazepam 1 mg/kg body weight IV slowly over three minutes.
   - First dose for woman: diazepam 10 mg IV slowly over 2 minutes.

3. Clean the source of infection. Clean the infected area (usually the cord in a newborn baby) with soap and water or chlorohexidine.

4. Give broad spectrum antibiotics, *see Guide for Caregivers – Formulary.*

5. Feeding. Many tetanus patients die because of aspiration during feeding. Never try to force feed with the hand or a spoon. Feeding can usually be done with a nasal gastric feeding tube. Give intravenous fluids for hydration and nutrition when a feeding tube is not possible or not available, see Module 8: **Stabilize and Refer**.

6. **General care.** Tetanus is a very time consuming sickness to treat. It is very, very important to get refer the woman and baby for care. The person with tetanus needs feeding and temperature monitoring. The temperature must always be taken under the arm to prevent breaking a thermometer in the mouth or rectum during a convulsion. Adults with tetanus usually are catheterized. Babies must be kept clean and dry after they urinate. Enemas may be needed to keep the bowels working. Bathing and turning the person are important to prevent the skin from becoming sore and ulcerated. The woman or baby with tetanus must be in a dark, quiet place. Try to plan all care at one time so the person will not be touched too often. Every time you touch a person with tetanus, you may cause a tetanus convulsion.

Prevention. Give DPT (diphtheria, pertussis, and tetanus) to all infants. Give tetanus toxoid to adolescent girls and pregnant women. Tetanus immunization protects the woman and baby. At least 2 doses are required for 80 per cent protection from tetanus (at least 3 doses are required for diphtheria and pertussis protection). **It is the responsibility of every health worker to make sure every girl and woman is immunized against tetanus.** A person does not get immunity by having tetanus. A full course of tetanus toxoid must be given to the tetanus victim after recovery. See immunization schedule in *Guide for Caregivers – Formulary.* Teach all who do or help with deliveries, do circumcisions, or scarification to wash their hands, wear gloves and to use very clean equipment. Do not use cow dung as medication on any open cut.

A Midwife's Experience...

A frightened and crying young mother holds her 2-week old baby girl. She says her baby has been vomiting since morning. The baby was healthy until about 3 days ago when the mother noticed the baby was hot to touch. Last night the baby had a fit (convulsion) lasting about 5 minutes. She is not feeding well at the breast and has vomited twice already today.

The mother had a full term delivery at home. She is alone with her baby. I see that the baby is very weak. I hug the mother and tell her I will help her. She is so afraid and so am I. I ask her to let me hold her baby so that I can find out what is wrong. When I hold the baby, her skin almost burns my hands. The baby looks very ill and does not move. I quickly look and feel (as I learned in LSS).

I put wet cloths on the baby, gave broad spectrum antibiotic intramuscular, and explained to the mother that we must go to the hospital right away! We sent the gardener to tell her family. We expressed breast milk and fed the baby until transport arrived. The baby was cooler by the time we reached the hospital.

LSS Midwife, Uganda

Problem: HIV/AIDS Infection

AIDS (Acquired Immunodeficiency Syndrome) is a sickness that reduces and eventually stops a person's body from fighting infections. AIDS is caused by a virus called Human Immunodeficiency Virus (HIV).

When a healthy person has sex with an infected person, the HIV virus goes into the healthy person's body. The HIV virus is more easily passed from a man to a woman. If the healthy person is infected, the HIV test will be negative for 1 – 3 months. Sometime before the HIV test shows positive, there may be symptoms of fever, headache, muscle and joint pain. These symptoms of a seroconversion phase (a person who has just been infected) may or may not be remembered after tests show positive for HIV. During this phase there is a lot of virus in the blood and the person is very infectious. The person then recovers and feels well for months or years before the AIDS symptoms start. The only way they can know they are infected and can infect other people (including the baby if a pregnant woman is infected), is that their HIV test is now positive and they have been told of the results. The person is now a carrier of HIV, even though they look and feel healthy.

Findings. People with HIV may have no signs of AIDS for a long time (even 10 years) but can easily pass HIV to others. Early signs of AIDS are fever, diarrhea, and skin rashes.

HIV is passed from person to person. HIV can come from someone who looks and feels healthy. HIV does not live outside the human body for more than a few minutes. You can not give or get HIV by touching, hugging, kissing, or from insect bites, or by sharing food, a bed, or clothes. HIV can be transmitted by unprotected sexual intercourse, mother to child during pregnancy, birth or breast feeding, blood transfusion when the blood is not tested for HIV virus, infected blood getting into cuts or wounds of another person, infected needles and other instruments, unclean equipment in a clinic used from infected to noninfected person, traditional practices like piercing and scarification, and intravenous drug users sharing needles.

Action. There is no known cure for HIV/AIDS. There are medicines called antiretrovirals (ARV) to help people live many years after getting HIV. A person who is able to eat well and care for their body, mind, and spirit may live a long and healthy life. When the immune system is weakened by HIV/AIDS, secondary infections such as diarrhea, tuberculosis, candidiasis, herpes, and others happen more easily. When an HIV positive person gets another infection, HIV makes it worse.

A pregnant woman with HIV and malaria has a higher risk of illness, anemia, and a baby with low birth weight. Good nutrition, infection prevention and antenatal care can help a woman have a healthy pregnancy. WHO also recommends insecticide-treated bed nets, intermittent malaria treatment or daily prophylaxis, and antiretroviral treatment. These help to manage the combination of HIV and malaria which is very dangerous in pregnant women: **Refer to your HIV/AIDS and malaria country protocols,** and see *Guide for Caregivers – HIV/AIDS Counseling.*

When medicines are difficult to get or they are too costly, a woman may not be able to have the medicines she needs to stay well. You may be able to help prevent mother to child transmission of HIV (MTCT) by giving antiretroviral medicines during pregnancy, labor, and postpartum. **Refer to your HIV/AIDS country protocols for the antiretroviral medicines to use.**

Prevention. The *Guide for Caregivers – HIV/AIDS Counseling* has a summary of health information and advice about HIV/AIDS that may be used for teaching pregnant women, mothers, family members and community members. Midwives and other health providers are partners with women and families in providing ongoing support to the woman with HIV and Preventing Mother to Child HIV Transmission (PMTCT), see Module 2: **Antenatal**, Module 3: **Labor**, and Module 10: **Postpartum** for prevention of PMTCT.

Counseling. Midwives can help stop HIV/AIDS. Teach men and women about HIV/AIDS. When they learn more about it, they can decide to avoid getting infected or not to infect someone else. **Use information available in your country** and some or all of these points in counseling:

- Health Provider Attitudes. Think about prevention first, not just action to cure the person. Be helpful, not critical of the people who come to you. Some of us fear HIV/AIDs because so many people die from it. This fear may cause poor treatment of people with HIV/AIDs. Share prevention education about HIV before and during pregnancy. Treat women and families who have HIV/AIDS with respect and care. If a person comes to your clinic and is HIV positive, respect the trust she put in you and do not tell anyone about her sickness.

- Pregnancy Planning. Women at risk or living with HIV/AIDS, who do not want to carry a pregnancy, need your help in this choice. If it is legal in your country, they should be provided with abortion information. Women living with HIV/AIDS need counseling and support.

- Dual Protection. The idea of using condoms with another family planning method or using only condoms may be new to women and men. Counseling on the importance of preventing STIs and HIV should be part of family planning and STI clinics.

- Voluntary Confidential Counseling and Testing (VCCT). VCCT can help remove the shame and make people think of AIDS as a sickness to prevent. The counseling information can be given to help women make wise decisions all through the maternity cycle. This service must be confidential. No one should know except the person and the health worker. If possible, the same health worker should counsel before testing, draw the blood for the test, and do a counseling session after the test. Do not offer testing if you have no test available. If you do not have HIV medicines find out where they are available. Work with your government to get these in your clinic.

- Community Awareness and Mobilization. Prevention plans should be continued at all levels. Everyone can work on prevention and action plans. To lessen the shame that is common with HIV/AIDS, encourage community and religious leaders to be tested themselves and to have helpful and noncritical attitudes to those with HIV/AIDS.

- Dispel Local Myths. What people do not know about HIV/AIDs helps the epidemic get worse. Stories are told, like “sex with a virgin will cure the disease”, or “condoms contain HIV”. These are not true. Work with the community to have open discussions about sex, pregnancy, gender issues, and sexually transmitted infections.

- Work On Prevention Together With Care and Support. Prevention is still the key to stop the epidemic. Prevention works better when connected to care and support for the people who are infected. Care and support must include working on poverty, care of orphans, and food support, along with direct physical and emotional care of the person with HIV/AIDS.

Midwives and HIV infection. Fortunately, we as health workers do not get infected easily at work. Needle stick injuries and infected body fluids, especially blood on our skin or in our eyes are our main risks. We can prevent needle stick injuries and keep infected body fluids away by using Infection Prevention, **Learning Aid 2 and Learning Aid 4.** When health workers are infected with HIV, it is usually through unprotected sex. Rarely is there documentation showing HIV infection through contact when caring for women, men, and babies with HIV/AIDS infection.

REMEMBER

To prevent the transmission of HIV, women and men should:

- Avoid having sex with someone who has HIV
- Use condoms
- Use only sterile needles and other instruments

Review Questions

What Did I Learn? Find what you know and understand of this module section by answering the following questions. When you are finished, look for the answers in the module on the pages shown in parentheses ( ).

1. Describe postpartum infection (page 7.18)?

2. List 4 ways germs can get into a pregnant woman or her newborn baby (pages 7.6 – 7.7).

3. How can you, the midwife, prevent infection and save lives (pages 7.6 to 7.10)?

4. List 4 findings that will help you decide if a woman has post abortion infection (page 7.15).

5. What actions will you take to help a woman who has a post abortion infection (page 7.15)?

6. What actions by a midwife can prevent a post abortion infection (page 7.16)?

7. List findings that will help you decide if a woman has chorioamnionitis (page 7.17).

8. How will you decide that a breast abscess is ready to be cut and drained (page 7.20)?

9. How does tetanus infect a newborn (page 7.31)?

10. How can you prevent tetanus in the newborn (page 7.32)?

11. Septicemia is an infection of the whole baby, caused by germs in the blood. How can these germs get into the blood of a newborn baby (page 7.29)?

12. What actions will you take to help a baby with septicemia (page 7.29)?

13. Ophthalmia neonatorum can cause blindness in the new baby. Describe the actions you will take to care for a baby with ophthalmia neonatorum (page 7.28).

14. List and explain each of the infection prevention steps for processing equipment and supplies (pages 7.10).

15. Describe the high-level disinfection steaming method for gloves (Learning Aid 2, page 7.50).

16. How can HIV/AIDS be prevented (pages 7.34 -7.35)?

Case Study 1 - The Problem Solving Method

The Problem Solving Method is a way of thinking about the care you give to women. This case study will help you review the Problem Solving Method.

We all solve problems every day of our lives. We usually do not think about the steps involved in problem solving, though we all follow steps to solve problems. The Problem Solving Method is a way to help us follow steps in giving care to women.

The five steps of the Problem Solving Method are:

1.

2.

3.

4.

5.

Check your answers by looking in Module 1.

The Traditional Birth Attendant (TBA) sees you at the market and asks you to visit Mrs. P.I. She delivered 5 days ago. This morning she feels very hot and does not feel like bathing or eating.

ASK and LISTEN

What do you **ASK** the TBA on the way to see the woman?

You find out that Mrs. P.I. received antenatal care at the hospital, this is her second delivery, the baby girl is sucking, moving around and looks healthy, the labor was about 1/2 day, the perineum is intact, placenta and membranes are complete.

What do you **ASK** Mrs. P.I.?

You find out that she has abdominal pain, foul smelling bloody vaginal discharge, and chills. She has taken a little tea, but does not feel like taking any food. She has not taken any medicine.

Before you **LOOK and FEEL,** think about the information you have been told. For example, Mrs. P.I. has chills therefore you want to know if she has fever.

LOOK and FEEL

What examination do you do **(LOOK and FEEL**) on Mrs. P.I. using the **ASK and LISTEN** information?

Refer to Module 7.

You find that she is very hot to the touch, her pulse is 108 beats in a minute, she is flushed, *looks sick,* and has foul smelling, blood-tinged, purulent (pus) vaginal discharge. The uterus is firm, contracted, and very tender.

IDENTIFY THE PROBLEM

Using the information from **ASK and LISTEN, LOOK and FEEL**, what is the problem with Mrs. P.I.?

Refer to Module 7.

You **IDENTIFY THE PROBLEM** that Mrs. P.I. has an infection of the uterus. You know that untreated postpartum infection (sepsis) can move from the uterus into the abdomen. An abscess may form in the abdomen. The infection may go into the blood-stream, causing septic shock (shock due to infection) and death.

TAKE APPROPRIATE ACTION

What **ACTION** will you take to help Mrs. P.I.?

Refer to Module 7.

You explain to the TBA, the woman, and the family, that the woman is very sick and must get to the hospital as soon as possible. Ask the family to get transport, and go with the woman and baby to the hospital. While waiting for transport, help her rest in a semi-seated position. Keep her pelvis low to help drain discharge from the uterus and vagina.

Since you were called from the market, you probably do not have any antibiotics with you. **IF** you have antibiotics with you, give her a broad spectrum antibiotic such as ampicillin 1 gm by mouth.

Lower her fever and hydrate her by giving at least one glass (8 ounces) of water or other liquid every hour. If she is very sick, feed her the liquid with a spoon. If she begins to vomit, wait a little while and begin giving her liquids again. Reassure her and explain to her that the fluids will help her to get better and she must try to take them.

If it is possible to get IV fluids from your maternity, what IV fluid do you give and in what amount?

Refer to Module 8 for IV solutions.

Give normal saline because the woman needs fluid with sodium so that the fluid will stay in her circulation system to raise her blood pressure and keep her heart from working so hard. The fluid will also help her temperature to go down. If you do not have normal saline choose Ringers Lactate or any other fluid you may have. Give normal saline IV fluid as fast as it will go into her vein and watch the woman very carefully for swelling around the needle. You stay beside the woman while the IV is running in fast and take her blood pressure every 15 minutes.

When her systolic blood pressure is 80 mm Hg or above and her pulse is below 140, slow the IV down to 150 ml per hour and REFER. Mark the IV container with the hour for each 150 ml. Watch the solution going in and regulate it to 150 ml per hour.

If referral is delayed, continue the IV fluids at 150 ml per hour for 24 hours (this would be a total of 5000 ml in 24 hours if 1500 ml was given very fast in the beginning). Give oral fluids and food when the woman is able to drink and eat. Explain to the family they can also watch the amount of fluid that should be going into the vein.

Take and record the blood pressure every 30 minutes until referral is possible. Watch carefully for swelling around the needle when you are giving IV solution. If you see swelling, you need to check to see if the needle is in the vein. You watch this woman very carefully for shock as you go with her to the doctor.

What signs of shock will you **LOOK** for, as you go with the woman to the doctor?

Refer to Module 8.

If Mrs. P.I. is in shock or near shock, she will **LOOK** restless and nervous (anxious). The respirations will be shallow and fast (above 40 per minute). The pulse may be hard to feel (weak) and fast (above 140 per minute). The blood pressure will be low (below 80/60). The skin will **FEEL** cold and wet. If the fever is very high, the hands and feet may feel cold and the whole body wet.

What will you do when you reach the hospital?

Help the hospital staff move Mrs. P.I. and make her comfortable. Introduce the family to the staff and explain to her the staff will now be caring for her. Write down everything that you have done for Mrs. P.I., including any medicines given and explain to the staff. Ask the family to tell you when Mrs. P.I. comes home so that you can see her and follow up on her condition.

EVALUATE AND REPEAT THE PROCESS

This is the fifth step of the Problem Solving Method. Follow-up visits are important to see if the woman is feeling better, staying the same, or getting worse. Decide if the actions taken were effective at resolving the problem.

What will you look for and do for Mrs. P. I. when she returns home?

The follow up evaluation is done when Mrs. P.I. comes home to check for healing, any infection, and other postpartum care. You will need to repeat the problem solving method. See *Guide for Caregivers – Postpartum Counseling and Protocols* for postpartum care and anemia routines.

You may need to develop a new plan for treating her. Remember to check her baby for breast feeding, infection, and relationship with the mother.

Case Study 2 - Baby: What Is the Problem?

ASK and LISTEN

An eight day old baby is brought to your clinic. The woman says the baby does not suck. She says the baby is very hot. The woman tells you the baby has a seizure (fit) every time she touches her.

LOOK and FEEL

The baby is hot to touch. The jaw is tight in spasm and the body is stiff (rigid).

1. What is the PROBLEM?

2. What is the ACTION?

3. Was this PROBLEM preventable? If so, how?

ANSWERS - Case Study 2

1. *What is the **PROBLEM**? Tetanus is likely the problem, but think about sepsis too.*

2. *What is the **ACTION**? REFER as soon as possible. Give broad spectrum antibiotic to prevent infection and a sedative such as Valium or amobarbital sodium. Give both intramuscular (IM). If referral takes some time, help the mother to express breast milk and feed the baby with a spoon or a nasal gastric tube, if available. Give cool compresses for fever. To prevent convulsions, touch the baby as little as possible.*

3. *Was this **PROBLEM** preventable? If so, how? Yes, it was preventable. Give 2 injections of tetanus toxoid to the mother at least 4 weeks apart during her pregnancy. Teach birth attendants and mothers to wash their hands carefully and to use boiled or sterile equipment at deliveries. Teach them the umbilical cord is tied with a sterile or boiled string or thread, and cut with a sterile or boiled knife or a new razor blade. Teach those who perform circumcisions to use boiled or sterile instruments. Teach them to wash the cut area with soap and water every day and every time the child urinates or passes stool. Work with the community and birth attendants to discuss the importance of sterile cutting equipment and the dangers of circumcisions.*

Case Study 3 - Baby: What Is the Problem?

ASK and LISTEN

A woman says her three day old baby's eyes are red and swollen. The baby was delivered at home and had no eye care. Woman had a vaginal discharge during pregnancy and has it now.

LOOK and FEEL

The baby's eyes are swollen. When the eyelids are lifted, much thick, greenish discharge is seen.

1. What is the PROBLEM?

2. What is the ACTION?

3. Was this PROBLEM preventable? If so, how?

ANSWERS - Case Study 3

1. *What is the **PROBLEM?** Conjunctivitis, possibly the mother has gonorrhea.*

2. *What is the **ACTION?** Using a syringe, wash eyes with cooled boiled salted water (a pinch of salt in one-half liter of water). Wash from the nose outward toward the ear. Wash until all discharge is removed. Apply antibiotic eye drops or ointment. Wash eyes and put in antibiotic eye medicine every 15 minutes X 1 hour, then every hour X 24 hours. After the first 24 hours, do the procedure 3 times a day until eyes are normal. Give antibiotic IM. Treat both parents for gonorrhea, if testing is not available. Explain to the parents the infant became infected from the birth canal during delivery.*

3. *Was this **PROBLEM** preventable? If so, how? Yes, teach birth attendants and pregnant women that antibiotic eye medicine at birth can prevent this sickness. Teach mothers at antenatal clinic the cause of vaginal discharge can be treated and gonorrhea can be prevented by the use of condoms.*

Case Study 4 - Woman: What Is the Problem?

ASK and LISTEN

Woman complains of fever and chills and a bad smelling vaginal discharge. She delivered 5 days ago.

LOOK and FEEL

The temperature is 39°C (102.6°F), pulse is104. The lower abdomen is tender when you **FEEL** (palpate). You see and smell foul smelling bloody purulent (pus) discharge when you **LOOK**. When you do a vaginal examination (**FEEL**), the uterus is very tender to touch and it is soft.

1. What is the PROBLEM?

2. What is the ACTION?

3. Was this PROBLEM preventable? If so, how?

ANSWERS - Case Study 4

1. *What is the **PROBLEM?** Postpartum infection.*

2. *What is the **ACTION?** REFER the woman and her baby. Until referral can happen, place her in a semi-seated position, give a broad spectrum antibiotic. Help the baby attach and breast feed. Give oral hydration, at least one glass of liquid in an hour. If the woman is too sick to drink or is vomiting, give intravenous infusion. Reassure and explain to woman and family.*

3. *Was this **PROBLEM** preventable? If so, how? It is difficult to know in this situation, as we do not know where the woman delivered or the conditions surrounding her delivery. General cleanliness and HLD or sterile gloves and equipment should always be used for a delivery. Hand washing before examinations and washing of the woman's genital area before vaginal examinations and before delivery are very important.*

Case Study 5 - Woman: What Is the Problem?

ASK and LISTEN

Woman complains of painful swelling of her left breast. She also has fever and chills.

LOOK and FEEL

Her temperature is 38.6°C (102°F), pulse is 92, left breast is warm to touch and tender. One area is firm and reddened.

1. What is the PROBLEM?

2. What is the ACTION?

3. Was this PROBLEM preventable? If so, how?

ANSWERS - Case Study 5

1. *What is the **PROBLEM?** Mastitis.*

2. *What is the **ACTION?** Tell woman to breast feed from both breasts as breast feeding will help heal the breast and will not make the baby sick. Tell woman to put wet, warm compresses to red area for 30 minutes four times a day. Give an oral antibiotic. If reddened area forms a soft yellow center, a breast abscess must be drained.*

3. *Was this **PROBLEM** preventable? If so, how? Breast abscess can be prevented. Breast infection is usually caused when the breast is not completely emptied of milk after nursing or by bruising breast tissue when using poor technique for expressing milk. A mastitis may develop from cracks on nipples when the baby does not attach to the nipple correctly. Help the woman hold her baby so all of the nipple and areola is in the baby's mouth. This position will prevent sore nipples leading to cracks on nipples which lead to infection. Help the woman empty her breast by encouraging baby to suck and by gentle manual expression of breast milk after nursing if her breasts are not emptied. Prevent breast infection by good hand washing with soap, good breast care including gentleness and cleanliness, with special attention to the nipple. Good support for the breasts and watching the baby for skin, eye, or cord infection can also help prevent breast infection.*

Learning Aid 1 – History of Puerperal Infection

Puerperal infection (postpartum infection) has been recognized throughout history. Hippocrates, for example, wrote that the slowing down of discharge from the vagina in the weeks after delivery was the cause of puerperal infection. The true cause was not known until Louis Pasteur found germs (bacteria) using a microscope. Puerperal infection continues to be a common cause of maternal death, even though we know how to prevent infection.

In 1847, Dr. Ignaz Semmelweiss, was working at a maternity hospital in Vienna, Austria. He noticed the low mortality (deaths) from puerperal infection in a ward managed by midwives, but a high mortality in a ward managed by doctors. The doctors worked on dead bodies, then went to examine patients who were recovering from childbirth. He decided the doctors were transmitting a deadly infection on their unwashed hands. He got real proof of this when he saw a co-worker die of septicemia. The co-worker had accidentally cut himself with a scalpel used during the autopsy (examination) of a woman who had died of puerperal infection. Because of this accident, Semmelweiss asked his staff to wash their hands with an antiseptic solution before examining maternity patients.

During the first year of hand washing by doctors, mortality from puerperal infection at Semmelweiss' hospital was reduced from almost 12% to 3.8%. Even when they heard this, most doctors did not believe that invisible bacteria could do such a thing. Twenty years later, Pasteur's studies with the microscope and Lister's research with aseptic methods made doctors see and believe what Semmelweiss had been telling them.

Learning Aid 2 – Infection Prevention Steps with High Level Disinfection by Steam

Source: EngenderHealth 2007

Everything that touches broken skin, or is used to cut skin, such as a scissors, or goes through the skin, like a needle, must be sterile and have all germs removed. A sterile instrument *(no germs on it)* touched by something not sterile becomes contaminated and can not be used to care for a woman or her baby**.**

REMEMBER

- It is not wrong to contaminate something.
- It is very wrong to know that a place or instrument is contaminated and do nothing to make it safe.

There are 3 ways to **High-Level Disinfect (HLD)**: steaming, boiling and chemical, see **Learning Aid 10** for boiling and chemical methods**.** Steaming is an affordable method for clinics and maternities with not many patients. It destroys all microorganisms and some endospores.

Step 1: Decontamination. Soaking equipment and other things contaminated with blood or body fluids in 0.5% chlorine or other disinfectant solution makes things safer to touch. The first step helps the second step.

Put on gloves and apron. Make a 0.5% chlorine solution using a plastic container. Use the chart in **Learning Aid 8** to find the strength of the chlorine in your country and how much chlorine and water to use for preparing a 0.5% chlorine solution. Change the solution daily or when very soiled or cloudy. **Put used equipment in chlorine solution** immediately after using equipment. The solution should completely cover the equipment.

1. Catheters and tubing. Flush completely with solution using a syringe.

2. Instruments. Open them wide so the solution can touch all parts.

3. Needles and syringes. Do not take the needle and syringe apart. Hold needle and syringe down until covered by the solution. Fill with solution, flush 3 times and soak 10 minutes. Remove the needle and syringe by hand wearing cleaning gloves or with a forceps. If disposing of needle and syringe, put into a sharps container after soaking. If reusing the needle and syringe, continue with step 2 after decontamination step is completed.

4. Linen. Wear gloves or use a plastic bag on your hands when collecting used linen. **Do not touch** clothing or sheets stained with blood or body fluids with unprotected hands. Keep the stained cloths or sheets separate from other laundry.

5. **Gloves.** Remove your contaminated gloves before you touch anything, Figure 1.

   a. Rinse gloved hands in the 0.5% chlorine decontamination solution.

   b. Pull the cuff of the first glove part way down using the other gloved hand.

   c. Remove second glove by using the gloved fingers from first hand to pull your second glove down. (or you may just pull the entire glove off inside out).

   d. Completely remove gloves using the gloved fingertips of each hand (or with the second glove removed, remove the other glove by touching only the inside of the glove).

   e. Put gloves in decontamination solution to soak for 10 minutes. Remove from chlorine solution and rinse with clean water.

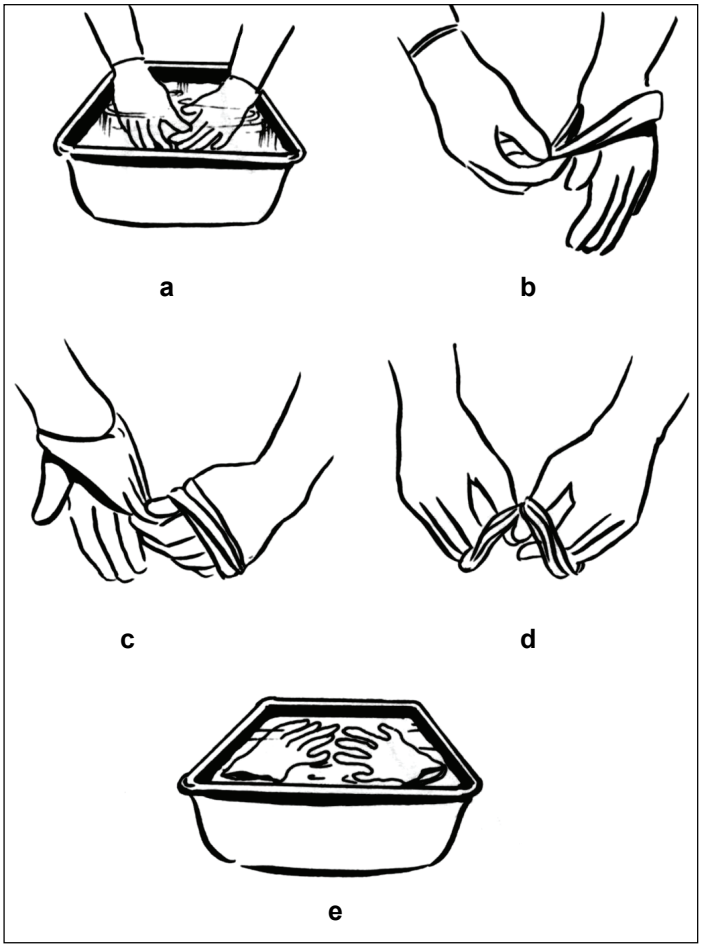

Figure 1. Remove gloves and decontaminate.
Source Klein 2004

Step 2: Cleaning and Rinsing. Cleaning removes all blood and body fluids, and any other material by washing with soap and water. Cleaning helps the disinfecting of the third step. Always use soap with water since water alone will not remove blood, oils, chlorine and other materials.

Wear gloves (heavy utility gloves or double glove using clean surgical gloves) and an **apron** when cleaning equipment.

Wash with soap and water.

1. Gloves. The risk in reusing surgical gloves is that they may have holes or tears that can not be seen. We advise that gloves be thrown away after reusing them 3 times. If this is not possible, then double glove for high risk procedures.

    a. Clean gloves by washing them in soap and water, turning them inside out to be sure both sides are free from all soil.

    b. Test gloves for holes. Grasp each side of the cuff of the glove. Trap air in the glove by flipping the glove over once. Hold the cuff so the air can't escape Then hold the glove under water. You will see air bubbles where there are holes.

    c. Dry gloves inside and outside before high-level disinfection or sterilization. When gloves are wet for a long time, they absorb water and become sticky.

2. Catheters and tubing. Make sure tubing is flushed well with soap and water.

3. Instruments. Use a soft brush to scrub equipment while holding in the water to prevent splashing. Brush the grooves, teeth and joints where blood and soil collect.

4. Needles and syringes. If not disposing of needles and syringes, flush well with soap and water. If disposing, place in sharps container.

5. Wash linen with soap and water. Wash heavily soiled linen separately from nonsoiled linen using disinfectant cleaning solution. Look to see that they are clean after washing. Rinse with clean water. Hang in the sun to dry. In your town, or area, a laundry business may clean the linen for you.

Rinse well with clean water until all soap is removed. The next step will work better with all soap rinsed off of the equipment or gloves.

Step 3: High-Level Disinfection (HLD). HLD is usually used in clinics and maternities with not many patients. It destroys all microorganisms and some endospores.

Procedure for HLD by Steaming.

1. Put water into a steamer pot. The steamer tray may be metal, bamboo, or other material.

2. Put in a steamer tray that has holes in it. Water in the pot should not touch the tray. If making your own tray with holes, push the holes from top to bottom so that rough edges are on the bottom.

3. Put all decontaminated and cleaned items on the steamer tray. If you are using a stack steamer, repeat this process until up to 3 steamer trays have been filled with items. Disassemble syringes, flush tubing, open scissors and other instruments with joints.

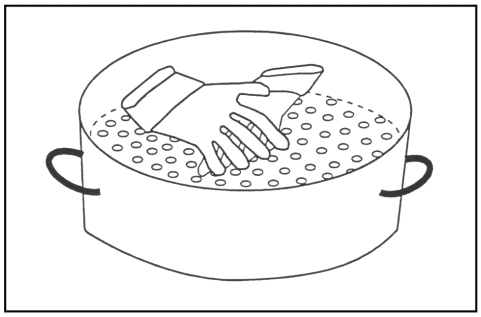

Figure 2. Gloves in steamer tray.
Source: Tietjen 1995.

4. If HLD gloves, place gloves in a steamer tray. To remove gloves from the tray, the cuffs should be facing outward toward the edge of the tray, see Figure 2. Five to 15 pairs can be put in each tray depending on the size (diameter) of the pans.

5. Place forceps or pickups on top of all other equipment to be boiled or steamed. Tie a string on the forceps. Hang the string over the lip of the container so you can remove the forceps easily. Put the forceps on the top steamer tray and on top of all other equipment to be steamed so it can be removed first.

6. Cover steamer pot and bring water to a boil. Do not add any more equipment after covering container.

7. When steam begins coming out, time for 20 minutes. Use a timer or note time on clock and write time in the HLD log book or on a paper. Do not add any items once timing starts. Bring water to a full rolling boil. When water simmers, very little steam is formed and the temperature may not get high enough to kill the germs. When water boils too hard, it evaporates quickly and wastes fuel. Keep the water boiling gently.

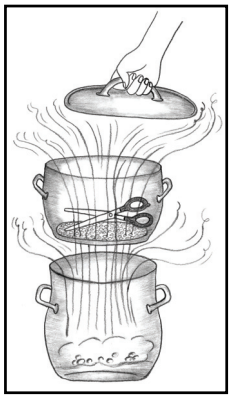

Figure 3. Cover steamer.
Source: Klein 2004

8. Remove steamer tray from pot. Remove lid, Figure 4. Gently shake the tray to remove water from the items.

9. Place the covered steamer tray on an empty pot to dry and cool the equipment and gloves. Never place the trays of newly steamed equipment directly on a table, counter, or other surface, as they will be contaminated.

10. **Use wet.** Allow equipment and gloves to cool for 5 to 10 minutes before using them "wet." Gloves should be used in 30 minutes if possible. After this time, the fingers of the glove stick together and are hard to put on. Any gloves taken out of the steamer tray(s) to be used "wet" or "damp," but that were not used during the clinic session today, should be processed again before use.

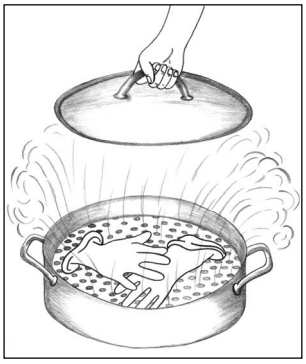

Figure 4. Remove steamer tray and lid.

11. **Use dry.** Allow equipment and gloves to air dry in the covered steamer tray 4 to 6 hours. Gloves may be hung on a line to air or sun dry. You will need to turn the gloves so that they dry on both sides. They will be used as clean gloves.

Transfer equipment: Using the forceps, transfer the equipment, to a dry, HLD container with a tight-fitting lid. The dry steamer pan and lid can be used for storage if needed.

- Transfer the gloves.
- Lightly powder the dry gloves.
- Place the powdered gloves, into a HLD container with a tight-fitting lid.
- When HLD gloves are used, the midwife washes her hands before she puts on the gloves AND washes her gloved hands before she provides care.
- When the clean gloves have been stored for one month without use, the midwife should wash the stored gloves with soap and water, and HLD them again, before she uses them to give care. To protect your glove supply, only process the number of gloves you think you will use in one month.

Step 4: Storage. At some births or for some procedures, there is time to get your equipment ready. In an emergency, you may not have time. For this reason, have one set of equipment ready at all times in your clinic and another set ready for home births. Correct storage is very important for giving safe care.

Do not touch the inside of the storage container where you have instruments stored. Remember that germs grow in moisture, and they will come back if the instruments are stored while they are wet.

- No solutions. Do not store equipment (including transfer forceps) or gloves in solutions. Germs can live and grow in both antiseptic and disinfectant solutions.

- Clean storage area. Keep storage area clean, dry and dust-free.

- Off the floor. Packs and containers should be stored off the floor.

- Do not use cardboard boxes. They collect dust and insects like to live in them and eat the boxes.

- Rotate containers and items. Date and rotate storage containers and sterile items (first in / first out).

- Length of storage.

  One Week: instruments, needles, and syringes that are **HLD** by boiling, steaming, or chemical disinfection.

  One Month: gloves that are **HLD** prepared. **Sterile** instruments, needles, syringes, and gloves that are wrapped, see **Learning Aid 3**.

REMEMBER
Correct storage is as important as
the steps of decontamination, cleaning, and HLD.

Learning Aid 3 – Sterilization

Sterilizing kills all germs, including endospores. After items have been decontaminated and cleaned, they are ready for sterilization. Sterilizing can be done using steam or dry heat.

Steam Sterilization. This is moist heat under pressure, so both water and heat are used. Heat can be electric, gas, kerosene or wood. The 'autoclave' must have a pressure gauge. Common household pressure cookers can be used for this.

1. Decontaminate, clean, and dry all instruments and gloves to be sterilized.

2. Open or unlock all jointed instruments, such as scissors. Steam can then reach all surfaces. Gloves should be folded with cuffs so that after sterilization the gloves can be put on easily without contaminating them see Figure 5. Put gauze or paper inside each glove and under the fold of the cuff to prevent sticking together. Glove powder can be used instead of gauze or paper, if available.

3. Instruments and gloves may be placed in separate stainless steel containers made for steam sterilizing. If these special containers are not available, the items must be wrapped for sterilization. Wrap the gloves as shown in Figure 5. For all items, use two layers of paper, newsprint or cotton (do not use canvas as steam may not go through it). Do not tie tightly or wrap packs with rubber bands.

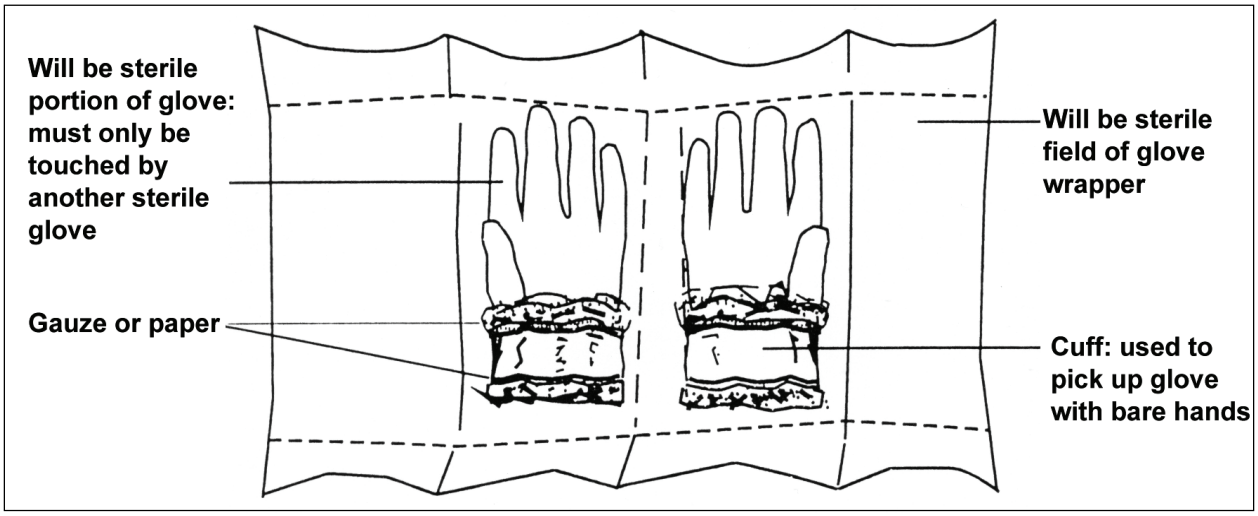

Figure 5. Preparing gloves for autoclaving.
Source: South East Asia Office/World Health Organization 1988.

4. Put all items in the autoclave in a way so steam can move freely. If instruments are stacked tightly in piles, steam can not touch all the surfaces.

5. There are many types of autoclaves used around the world. Follow instructions for each machine when possible.[1] Usually, sterilize at 121°C (250°F) and at a pressure of 106 kPa (15 lb/in^2) Using a higher temperature than the instructions suggest is very hard on your equipment. Begin timing once the autoclave reaches the correct temperature and pressure. Wrapped items are autoclaved for 30 minutes and unwrapped items for 20 minutes.

6. At the end of the cycle, if the autoclave is automatic, the heat will shut off and the pressure will go down. If the autoclave is not automatic, you must turn off the heat or remove it from the heat source at the end of the cycle.

7. Wait until the pressure gauge reaches 'zero'. Open the lid or door so the remaining steam escapes.

8. Leave instrument packs or items in the autoclave until they dry completely, which may be 30 minutes. Items must be removed dry. If a pack is damp (wet) when removed, treat as contaminated and reprocess.

9. Remove equipment from autoclave when dry. If items are not wrapped, use sterile forceps to remove them and put them in a covered, sterile container.

10. Use or store immediately. Gloves are very soft and tear easily after sterilization. Do not use the gloves immediately. Wait 24 to 48 hours to allow the elasticity (stretch) to recover and to prevent stickiness.

REMEMBER

Sterile equipment is not sterile if the container is not covered or
if the sterile equipment is touched with anything not sterile (such as hands, instruments).

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[1] The units of pressure marked on an autoclave's pressure gauge may vary from one autoclave to another. The following amounts of pressure are about the same pressure for autoclaving: 15 lb/in^2 (15 pounds per square inch), 106 kPa (106 kilopascals), 1 atm (1 atmosphere), 1 kgf/cm^2 (1 kilogram of force per square centimeter), 776 torr, 776 mm HG (776 millimeters of mercury).

Dry Heat Sterilization. A common household oven is good for dry heat sterilization. Gas or electric heat will work.

1. Decontaminate, clean, and dry all instruments to be sterilized. Do not use dry heat sterilization for gloves or rubber items.

2. Wrap items in a double layer of cotton fabric, or put unwrapped on a tray, or put into a metal container with a lid.

3. Put items in the oven and heat to the needed temperature. Use an oven thermometer to make sure the temperature is correct.

4. Begin timing after the temperature is correct. Do not open the door or add any items after timing starts. Use the list below to decide how long to heat instruments. Sharp instruments and needles should not be sterilized at temperatures higher than 160 degrees C.

Amount of Time to Use Dry Heat

Temperature Degrees		Dry Heat Sterilization Time
Centigrade	Fahrenheit	
170	340	1 Hour
160	320	2 Hours
150	300	2.5 Hours
140	285	3 Hours

5. Turn the oven off and leave the items in the oven to cool before removing them.

6. When completely cool, remove items.

7. Use or store immediately.

   - Wrapped items with proper storage and little touching, can be used as sterile for 30 days. Holes in the wrappers or damp or wet wrapped items let germs inside of the wrapper. When you are not sure about the sterility of a wrapped item, treat it as contaminated and sterilize again.
   - Unwrapped items should be used immediately or keep them in a covered sterile container for up to one week.

Learning Aid 4 – Hand Protection: Routine Washing, Surgical Scrub, Using Gloves

1. **Routine hand washing** is the best way to keep from passing germs. Germs are carried on your hands as you touch things. Germs are under your fingernails. Keep your fingernails short and clean. Hand washing should be the most frequent activity of the midwife.

   Preparation: Have soap, clean water, and a clean dry towel ready. Use a soap rack that drains moisture away from the soap. Ordinary soap is fine. Running water may come from a tap or poured from a cup or pitcher.

Important Times to Wash Hands

- When starting work.
- Before and after giving care.
- Before putting on and after removing gloves.
- After touching anything contaminated with blood or body fluids.
- After toilet, blowing nose, or coughing.
- When leaving work.

   a. Remove all jewelry. Watches or rings hide places that are difficult to clean. Pin your watch to your clothing so you can use it but have it out of the way.

   b. Wet hands and forearms with running water. Dipping hands into basins of standing water is not good, even if using Dettol® or Savlon.®

   c. Wash hands and arms with soap. Lather hands well, rubbing fingers, palms, backs of hands, arms and wrists (all parts of your hands and lower arms) for at least 10 - 15 seconds. Wash longer if hands are visibly soiled.

   d. Rinse hands and arms with clean running water until all soap is gone.

   e. Dry your hands with a clean towel or allow hands to air dry. Towels should be used by only one person; if used by more than one person, the towel is contaminated.

   f. An antiseptic hand rub can be used instead of soap and water **when hands are not visibly soiled.**

Using an Antiseptic Hand Rub

What is it? Cleaning hands with antiseptic solution instead of soap and water.

When to Use? Use when you see no dirt, blood, fluid, or anything on your hands or under your fingernails.

Advantages

- Slows or kills most gram negative and gram positive bacteria, TB, viruses (HIV), and fungi that are so small you can not see them.
- If used with hand softeners like glycerin or propylene glycol, protects and softens skin.

How to Make. Mix 100 mL 60–90% ethyl or isopropyl alcohol with 2ml skin softener (glycerin, propylene glycol, sorbitol)

How to Use

- Pour about 5 ml into hands, enough to cover your hands and fingers.
- Rub solution briskly palms and back of hands, between fingers and under nails, until solution is gone and hands are dry.

2. **Surgical hand washing** reduces the client's chances of infection in case surgical gloves develop holes or tears. The warm and moist conditions when you are wearing gloves encourages the growth of germs inside of the gloves.

   Doing a surgical scrub of your hands with an antiseptic (before putting on surgical gloves) removes or kills many of the germs, and also helps prevent germs from growing on your hands. It is necessary for midwives to be skilled in surgical hand washing to prevent contamination when assisting in the operating room.

   a. Remove all jewelry on your hands and wrists.

   b. Wet your hands and forearms.

   c. Put soap (or antiseptic solution) on your hands and your arms to your elbows

   d. Clean under each fingernail with a surgical brush, stick, or nail file. Take care not to cut your skin. Keep your fingernails short.

   e. Hold your hands above elbow level and wash. Use a circular motion, begin at the fingertips of one hand and lather and wash between the fingers, continuing from fingertip to elbow. Repeat this for the other hand and arm. This should take 3-5 minutes.

Antiseptics

The following *antiseptic solutions* are safe for the skin and commonly available in different parts of the world:

- Chlorhexidine gluconate (4%), for example, Hibiclens®, Hibiscrub®, Hibitane®.
- Chlorhexidine gluconate and cetrimide, various concentrations, for example, Savlon.
- Iodophors, various concentrations, for example, Betadine®.

If only hand soap is available, then use hand soap for the surgical scrub.

   f. Rinse your hands and arms (holding your hands above your elbows) with running water from a tap or poured by a helper.

   g. Using a sterile towel, dry your hands and arms – from fingertip to elbow- using a different side of the towel on each arm.

   h. Keep your hands above the level of your waist and do not touch anything before putting on surgical gloves.

3. **Using Gloves. Wearing gloves is not a substitute for hand washing.** Waterproof gloves protect women and babies you care for from any germs on your hands even after washing your hands. Gloves also protect you from any germs the woman and baby may have.

   Wear HLD or sterile gloves when you will come in contact with blood or body fluids during deliveries, vaginal exams, and other procedures. For an invasive procedure such as manual removal of the placenta, protect your arm by covering with a plastic bag or fingerless glove.

   If you have no gloves and must come in contact with blood or body fluids, use plastic bags that have been washed with disinfectant solution. Bags are a little harder to use than gloves, but they are better than working with no protection

   Making and Using Fingerless Gloves

   - Cut the four fingers (not the thumb) off of a glove just below where all the fingers join the glove.
   - HLD or sterilize a pair of 'fingerless gloves' and store with your prepared gloves.
   - Wash your hands the same way as you do before putting on gloves.
   - Put fingerless glove on both hands and pull up your arm to your forearm.
   - Put on HLD or sterile gloves on both hands and pull to cover the end of the fingerless gloves.

   How to put on gloves**,** see Figure 6.

   a. Wash your hands with soap and water as described above.

   b. Open the glove package or container without touching the gloves, Figure 6 – 1. The gloves should be folded at the cuff.

   c. Pick up the first glove with the folded cuff, Figure 6 – 2. Do not touch the outside of a glove with your hand or it will be contaminated.

   d. Slide your hand part way into one glove, lift it up, Figure 6 – 3. Pull only on the folded cuff. Do not unfold the cuff or touch the outside of the glove.

   e. Pick up the second glove by putting your gloved fingers into the fold of the cuff. Slide your ungloved hand into the glove, Figure 6 – 4.

   f. Wiggle your hand in while you roll back the cuff, Figure 6 – 5 & 6.

   g. Then roll back the cuff of the first hand.

   h. Once the gloves are on, do not touch anything that is not sterile or your gloves will not be sterile anymore, Figure 6-7. If you contaminate the gloves, they must be replaced. **Do not touch anything that is not sterile.**

   i. When finished with the procedure, remove gloves as described in Figure 2.

j. After removing gloves, wash your hands immediately with soap and water before you do anything else to remove any germs. Sometimes gloves have tiny holes or tears that can not be seen. Germs can go in the holes and reach your hands.

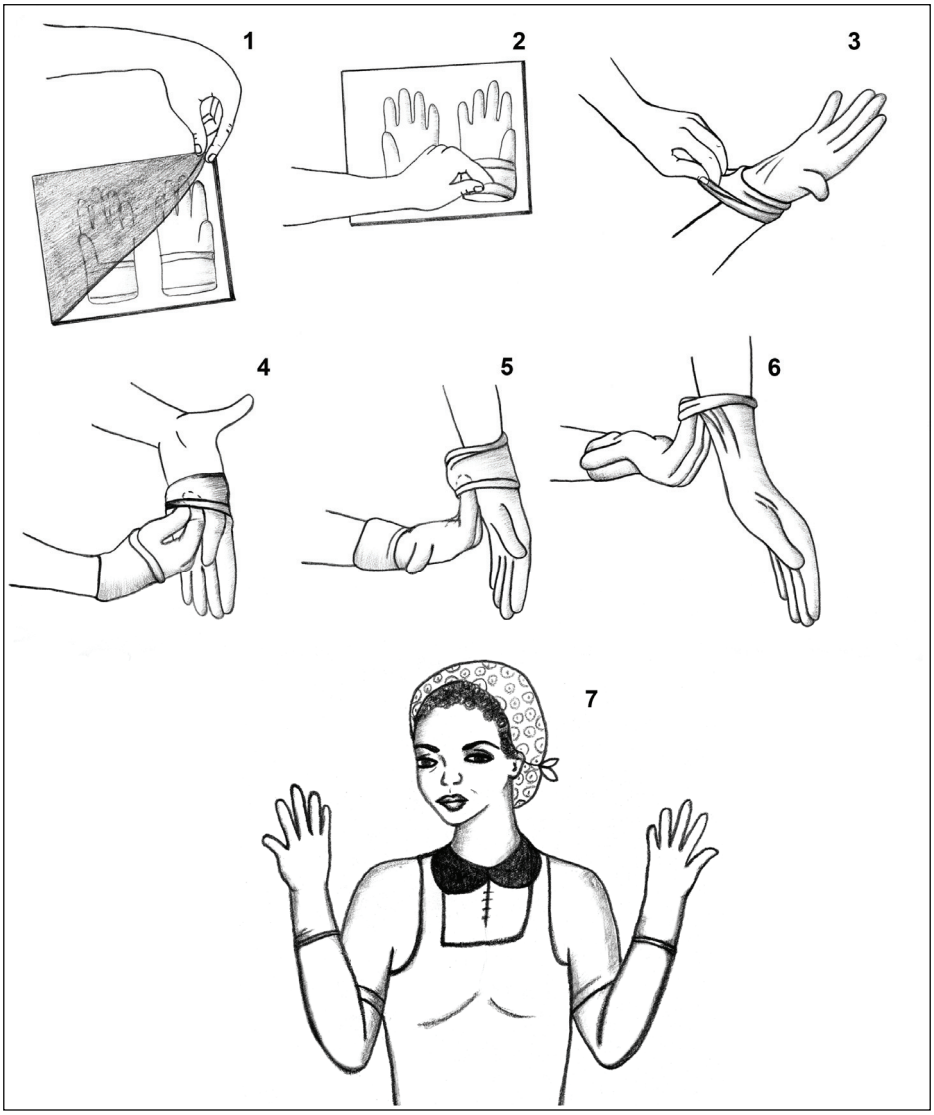

Figure 6. How to put on sterile gloves.
Source: Klein 2004

Learning Aid 5 – Dispose of Wastes

The midwife is responsible for careful disposing of blood, body fluids and other wastes in her clinic and community. Burning contaminated wastes in a container at a high temperature reduces the volume and weight of the wastes. Open burning is not recommended because it is dangerous and the wind may scatter the wastes. In clinics with limited resources, safe burial of wastes on or near the facility building may be the only option available for waste disposal. To limit health risks and environmental pollution some basic things should be done.

1. Body wastes such as blood, stool, or placenta should be disposed of in a sewer system. If no sewer system is available, put body wastes in a latrine or bury and cover deep in the ground. The placenta may need special handling depending on local custom. If the family must dispose of the placenta, put it in a leak proof container and cover with decontamination solution for 10 minutes. Advise the family to use gloves if they must handle the placenta and to bury it in the leak proof container (plastic bag) if at all possible. Decontaminate and wash any containers holding body wastes.

2. Sharps such as razor blades, needles for suturing, or injections must be put in a container so they will not stick anyone. Dispose of the sharps in a puncture resistant and leak proof container. The container may be metal or heavy plastic with a lid or tape to close it. A heavy cardboard box may be used if that is the only available container. It is important the container is not too large. When it is about ¾ full of sharps, **pour decontamination solution over the contents to protect anyone who may touch the contents, depending on your situation.** After 10 minutes burn or bury the container in the ground.

   Safe disposal of sharps may not be easy. Encourage community members to bring used razor blades and any other sharps to you for disposal. Sharps (including used needles and syringes) are dangerous to children and adults. When children or adults find them, they like to play with them, sell them, or use them. It is very important that midwives and other health workers make sure that all sharps are disposed of safely. Think about how you can do this at your work place.

3. Other wastes, like gloves, syringes, or cotton wool soaked in blood, should be soaked in decontamination solution for 10 minutes and then buried deep in the ground. Do not put any contaminated wastes in a common waste dump.

   To make a disposal pit for contaminated wastes some things must be done:

   - The access to the pit (disposal site) should be restricted. Build a fence around the area to keep out children and animals.

   - The disposal pit should be at least 50 meters away from any water source to prevent contamination of the water source (table).

   - The pit should have proper drainage, be located downhill from any wells and free standing water, and not be in an area that floods.

- Build the pit at least 6 meters (18 feet) from your clinic.

- Dig a pit 1 meter (3 feet) long and 3 to 5 meters deep. If water comes into the pit while you are digging it, move the pit to another place and do not dig as deep because the bottom of the pit should be above the water level.

- Make the pit smaller at the bottom than at the top. The sides of the pit will slant in, and then the sides of the pit will not break down.

- Line the sides of the pit with stones if the soil is sandy or unstable.

- Each time you put wastes in the pit, burn them. Cover with soil 10-15 cm (4-6 inches) of dirt after the burning. When the pit gets up to 50-60 cm (20-24 inches) from the top, cover and compact the dirt with soil and stones to prevent odors, insects, and to keep animals from digging up the buried waste.

- If you use the pit only for contaminated medical wastes, burn each time you add waste, and depending on the volume of waste, this pit may last for up to 6 months.

Learning Aid 6 – Incision and Drainage of Breast Abscess

A breast abscess is a collection of pus in a small area which begins as a painful, hard, red swelling in the breast. Over time, or with the application of hot compresses, the swelling softens and forms a soft yellow center. The abscess is ready to be cut open, and the pus drained, to help healing and relieve the pressure and pain.

Equipment

Scalpel and size 11 blade	Gauze squares and bandage
Soap and water	Analgesia/anesthesia
Sterile gloves and artery forceps	Container for waste

Procedure

1. Start the woman on a broad spectrum antibiotic.

2. Get all the equipment ready.

3. Tell the woman what you are going to do. Help the woman sit on a chair with her breast resting on a table.

4. Very gently wash the breast with soap and water. LOOK and FEEL to know where the pus area (soft, most painful, and tender to touch) is on the breast.

5. Give analgesia intramuscular (IM) or local anesthesia (spray ethyl chloride on the soft and painful part of the breast). If analgesia or anesthesia is not available, give oral analgesia and wait about 1 hour for the medicine to take effect. Continue with the incision and drainage. The woman may not be able to relax. She will have pain and be uncomfortable. Explain to her the pus must be taken out of her breast so that she will be able to breast feed her baby. Help her to understand that the pus in the breast can spread to other parts of her body and make her sicker than she is right now. Tell her that she will not get better until the pus is removed from her breast.

6. Wash your hands. Put on sterile (HLD) gloves if you have them.

7. Cut the abscess with the point of the blade. Make sure the cut is big enough to put your finger into the opening. Make the cut all at one time. Cut in a straight line towards the nipple. Thick yellow, green, blood stained, foul smelling drainage (pus) will usually run from the opening.

8. If you are wearing sterile gloves, gently push your finger into the opening so that you will break up the pockets (sections) of the abscess and the pus will drain out. See Figure 7.

9. You may use a sterile hemostat (artery forceps) to break up the abscess. Open the hemostat to break up the pockets of the abscess so that it will drain. Let the pus drain until it stops.

10. Do not press or squeeze the breast, this will be too painful for the woman.

11. Open a sterile 4 x 4 gauze square. Start with one corner and gently push gauze into the opening as far as it will go. Let a little of the gauze stick out of the opening, Figure 8. The gauze packing will help drain the pus.

12. Cover the opening with gauze and wrap with a bandage. Help the woman put on a loose fitting brassiere. If she does not have a brassiere, use a sling, head tie, or other cloth to support the breast.

13. Change the dressing daily. Give oral analgesia as needed. Pull the gauze out a little each day to help the pus drain. Remove gauze in 4 days. Continue broad spectrum antibiotics for 10 full days, see *Guide for Caregivers - Formulary.* Encourage the woman to breast feed on both breasts as soon as she can tolerate it. Continue to see the woman until there is no pus drainage and the opening is closed.

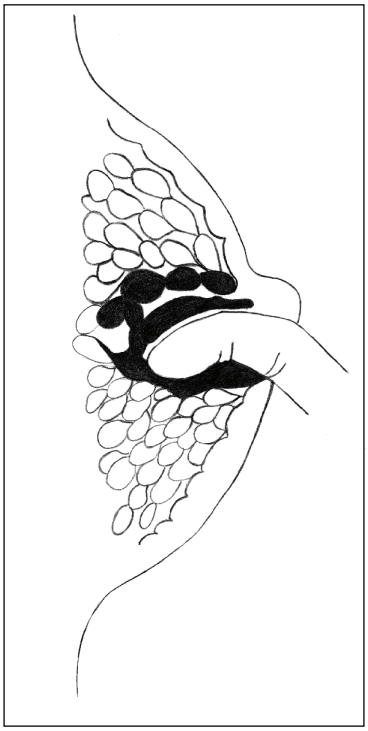

Figure 7. Breaking up the pockets of the abscess.

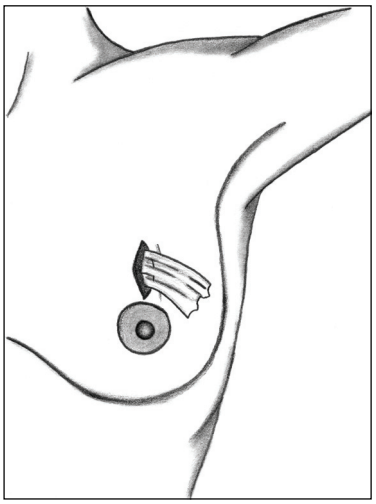

Figure 8. Gauze packing.

Learning Aid 7 – General Cleaning Principles

- Post in each area a schedule and explanation of the method to clean the area.
- Start cleaning least soiled areas first and then go to most soiled areas.
- Start cleaning at high surfaces first and then go to low surfaces.
- Scrubbing is the best way to remove dirt and germs.
- Dry sweeping and dusting should not be done as dust and germs get in the air.
- Always use disinfectant cleaning solution to clean blood or other body fluid spills.

Recommended Cleaning for a Health Facility

WHEN TO CLEAN	WHAT TO CLEAN
Clean with Disinfectant Cleaning Solution (A mix of 0.5% Chlorine Solution with enough soap to make a mild soapy solution.)	
After Discharge of a Patient	• Mattress, bed linen, bed frame, cot, incubator • Any other equipment used for the patient's care
Immediately	• Furniture, floors, bed, tables (after a procedure or delivery) • Spills of blood or other body fluid (Cover with a cloth soaked in decontamination solution for 10 minutes. Wipe up all spill and scrub with soap and water solution.)
Daily (More often if you can see dirt)	• Examination rooms • Furniture and equipment used daily (exam table, table tops, counters, weighing scales) • Sink, toilets, latrines and waste containers (Use a different mop, cloth, or brush to clean these.)
Clean with soap and water solution using a damp cloth or mop	
Daily	Floors, equipment (stethoscopes, BP cuff)
Weekly	Doors (including door handles), windows, walls, ceilings and ceiling fixtures (more often if you can see dirt)

Learning Aid 8 – Preparation of Chlorine Decontamination Solution

How to Prepare 0.5% Chlorine Decontamination Solution
(Mix according to the strength of the locally available brand of bleach.)

Type or Brand (by Country)	Active Chlorine	Water to Chlorine = 0.5% Solution
LIQUID BLEACH (Sodium Hypochlorite Solution)		
8 ° Chlorum [2]	2.4%	Mix 10 ml bleach in 40 ml water (1 part bleach to 4 parts water)
12 ° Chlorum ; *JIK* (Africa); *Robin Bleach* (Nepal); *Ajax* (Jamaica)	3.5%	Mix 10 ml bleach in 60 ml water (1 part bleach to 6 parts water)
Clorox or bleach (Indonesia, Peru, USA, Canada; *ACE* (Turkey); *Eau de Javal* (France, Vietnam)	5%	Mix 10 ml bleach in 90 ml water (1 part bleach to 9 parts water)
15 ° Chlorum; *Lejia* (Peru); *Blanqueador* or *Cloro* (Mexico)	6%	Mix 10 ml bleach in 110 ml water (1 part bleach to 11 parts water)
Lavandina (Bolivia)	8%	Mix 10 ml bleach in 150 ml water (1 part bleach to 15 parts water)
Chloros (United Kingdom - UK); *Liguria* (Peru)	10%	Mix 10 ml bleach in 190 ml water (1 part bleach to 19 parts water)
Chloros (UK); *Extrait de Javel* (France);48 ° Chlorum	15%	Mix 10 ml bleach in 290 water (1 part bleach to 29 parts water)
DRY POWDERS		
Calcium Hypochlorite	70%	Dissolve 7 grams in 1 liter water
Calcium Hypochlorite	35%	Dissolve 14 grams in 1 liter water
Sodium Dichloroisocyanurate (NaDCC)	60%	Dissolve 8.5 grams NaDCC in 1 liter water
Chloramine (Tosylchloramide Sodium)	25%	Dissolve 20 grams in 1 liter boiled water
TABLETS		
Chloramine Tablets [3] (Tosylchloramide Sodium)	1 gram chlorine per tablet	Dissolve 20 grams in 1 liter boiled water (20 tablets per liter)
Sodium Dichloroisocyanurate (NaDCC-Based Tablets)	1.5 grams chlorine per tablet	Dissolve 4 tablets in 1 liter water

Adapted from: WHO 1989 and Tietjen 1992, Ipas 2004.

[2] Chlorine concentration may be measured in chlorometric degrees (° Chlorum). One " ° Chlorum" is about 0.3% available chlorine.
[3] Chloramine releases chlorine slower than hypochlorite. Before using solution, be sure the tablet is completely dissolved.

Learning Aid 9 – Infection Prevention Guidelines for Health Care Equipment

Item	Step 1 Decontamination	Step 2 Cleaning	Step 3		Dry Before Storage	Step 4 Storage	Disposal	
			HLD	Sterilization			Bury	Burn
Surgical / Examination Gloves Disposable	Yes						Yes	No if made of polyvinyl chloride
Surgical Gloves Reusable	Rinse in solution while on hands, turn inside out, put in solution	Wash with soap water, test for holes, rinse both sides	Yes	Yes always for surgical procedures	Yes	Yes		
Instruments - metal	Open wide	Scrub with brush under soap water and rinse	Yes Open wide	Yes. Dry then sterilize	Yes	Yes		
Needles, Disposable	Flush with solution before soaking						Yes	Yes
Needles, Reusable		Use syringe to flush with soap water and rinse water several times	Yes	Yes	Yes	Yes		
Syringes, Disposable							Yes	No if made of polyvinyl chloride
Syringes, Reusable		Yes, flush and rinse	Yes	Yes	Yes	Yes		
Catheters / Tubes – Rubber/Plastic	Flush with solution before soaking	Use syringe to flush with soap water and rinse water several times	Yes Steam or boil	Rubber only Not plastic	Yes	Yes	Rubber and plastic	Rubber only
Ambu bags and face masks	Wipe with 60-90% alcohol or 0.5 % chlorine	Wash and rinse immediately after Step 1			Air or towel dry	Yes		
Suction bulbs	Flush and fill bulb with solution Put bulb into solution	Flush with soap water and rinse water three times			Air dry	Yes		
Aprons and other Plastic/Rubber	Wipe with 0.5 % chlorine	Wash with soap water Rinse with clean water			Air or towel dry	Yes		
Linens, Surgical caps, masks, cover gowns, cloth aprons	Soak and rinse with 0.5% chlorine	Wear protection when handling. Wash with soap water, then rinse			In sun, or machine, or iron	Yes		

Source: JPHEIGO 2006, Engenderhealth 2001, 2007, IPAS 2004.

Learning Aid 10 – High - Level Disinfection (HLD) by Boiling

1. After items have been decontaminated and cleaned, they are ready for HLD by boiling. It is better to steam gloves for all procedures. Boil gloves if unable to steam or sterilize.

2. Put all items into boiler.

3. Open scissors and all instruments with joints and take syringes apart. Flush all tubing with water. If gloves, place in a bag made of netting. Place a weight in the bag so that all gloves and the bag will be at least 2.5 cm (1 inch) below the surface of the water.

4. Place forceps or pickups on top of all other equipment to be boiled. Tie a string on the forceps. Hang the string over the lip of the container so you can remove the forceps easily.

5. Cover all items completely with water.

6. Place the lid over the pan. Do not add more equipment after covering container. Bring water to a full, rolling boil. When water only simmers, the temperature at the surface may not be high enough to kill microorganisms.

7. Reduce heat so that water continues to boil at a rolling boil. When water boils too violently, it evaporates quickly and wastes fuel. Be sure there is enough water in the pan to cover items for the entire 20 minutes of boiling.

8. When rolling boil begins, start the timer or note the time on a clock and record in HLD log (book) or on a paper.

9. Boil gloves and instruments for 20 minutes.

10. After boiling, remove items with boiled forceps on the top of the other equipment. Never leave boiled objects in water which has stopped boiling to prevent contaminating and corroding the objects. As the water cools and steam condenses, air and dust particles are pulled down into the container and may contaminate the items.

11. Use the HLD forceps to move instruments to a high-level disinfected container with a cover (a steamer tray may be used).

12. Allow excess water to drip off the bag of gloves (shake the bag gently). Place the bag in a high-level disinfected container, cover, and allow to cool (about 5 to 10 minutes) before use.

13. See storage in Learning Aid 2. For post abortion procedures, boiled surgical gloves are worn "wet" after being boiled and cooled). For pregnancy procedures, air dry and store.

Learning Aid 11 – High - Level Disinfection (HLD) by Chemicals

Some equipment can only be cared for with chemicals. Thermometers can not be baked, boiled or steamed. Some sharp instruments like curettes, blades, needles and scissors may get dull with too much heat.

Make sure everything is decontaminated and cleaned, and that instruments are open and syringes disassembled, see **Learning Aid 2 – Step 1 and Step 2**. It is not recommended to treat gloves with chemical disinfection.

If you must use chemical HLD read the directions on the container of the chemicals. **Glutaraldehyde 2- 4%** (Cidex) and **formaldehyde 8%** are chemicals used by some clinics and hospitals. They are very toxic. **Chlorine (bleach) 0.5%** solution can be used but it is hard on your equipment when used for HLD. Use HLD with chemicals only when you have no other method to prepare equipment.

Antiseptics do not have the same killing power as chemicals used for high-level disinfecting (HLD). Antiseptic solutions should **never** be used for HLD of instruments.

DO NOT USE FOR HLD:

Eusol, Hibitane, Savlon, Dettol, PhisoHex, gentian violet, Zephiran, Lysol, cetrimide, phenol, mercury compounds

These do not work for chemical disinfection.

Procedure. Use the directions on the chemical container and the following outline.

1. Put equipment in container.
2. Cover equipment completely with a chemical solution.
3. Soak in glutaraldehyde 2 - 4% (Cidex) for 10 hours, or formaldehyde 8% for 24 hours, or chlorine 0.5% for 20 minutes. Remember chlorine is very hard on your equipment.
4. Rinse with boiled water after soaking.
5. Remove equipment from the container with HLD forceps.
6. Put equipment in a HLD covered container.
7. Air or sun dry before storage.
8. For storage, see **Learning Aid 2**.
9. Dispose of soaking solution and rinse water in the waste pit, see **Learning Aid 5**.

Learning Aid 12 – Help Avoid Glove Problems

Ways to Help Avoid Glove Problems for HLD Steam and Boil

Probable Cause	Recommended Solution
PROBLEM: STICKY GLOVES	
Residual soap.	Reduce amount of soap used when washing gloves. Rinse gloves at least three times in clean water.
Heated to high temperature for too long.	Sterilize for 30 minutes at 121°C (250°F). Remove gloves from sterilizer as soon as cycle is completed.
Gloves sterilized with other goods.	Sterilize gloves separately.
Gloves not drying completely after steaming.	Wear "wet" within 30 minutes or allow them to dry for 4 to 6 hours before using.
Poor powdering.	Use absorbable glove powder and follow manufacturer's instructions.
Surfaces of gloves touching each other.	Insert gauze or paper between the palm and back of hand of each glove and between the hand of the glove and the turned-back cuff. This allows steam to contact all surfaces during sterilization and prevents surfaces from sticking to each other.
Breakdown (deterioration) of rubber (latex). (Rubber gloves deteriorate while stored even though they have not been used. They become soft, sticky, and unusable.)	Store in a dry cool area. Do not store in direct sunlight.
PROBLEM: EXCESSIVE TEARING OR RUPTURING	
Gloves used too soon following sterilization.	**Do not** use gloves for 24 to 48 hours after sterilization allowing gloves to regain elasticity.

Source: Tomlinson 1991.

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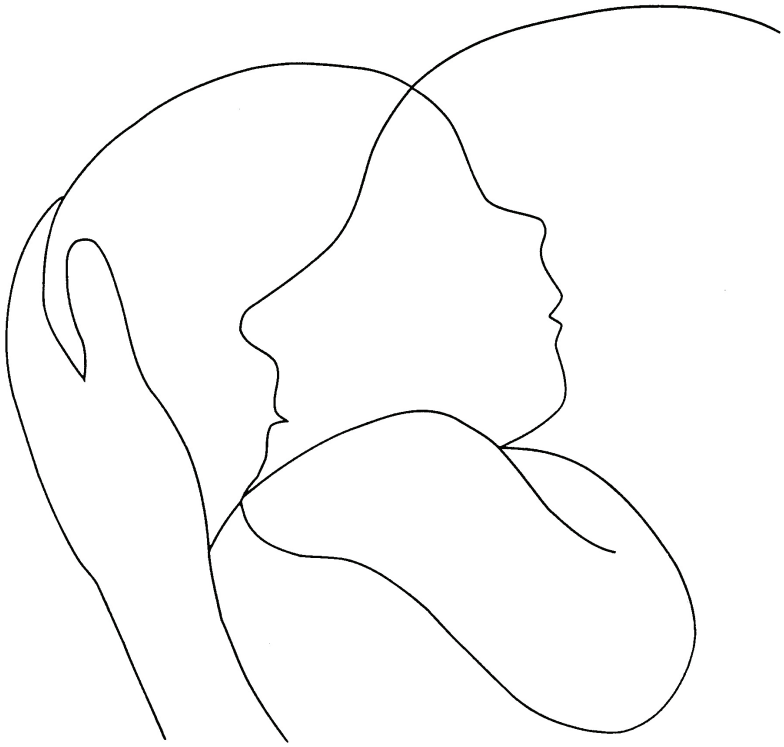
Notes

Life-Saving Skills
Manual for Midwives

Fourth Edition

Module 8: Stabilize and Refer



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American College of Nurse-Midwives

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Life-Saving Skills Manual for Midwives

MANUAL TABLE OF CONTENTS

STABILIZE AND REFER

MODULE 8

Table of Contents

STABILIZE AND REFER

Goal

The midwife will review and update her knowledge and skills to stabilize and refer a woman or baby with complications of shock or dehydration using the problem solving method.

Objectives

The midwife caring for a woman or baby will be able to:

1. Demonstrate the life-saving steps for a woman or newborn in an emergency.
2. Give immediate emergency care and refer.
3. Describe family and midwife plans for emergency referral care.
4. Demonstrate the skill of starting an intravenous infusion for a woman.
5. Demonstrate the skill of inserting a nasogastric feeding tube for a baby.
6. Demonstrate how to prepare oral rehydration solution (ORS).
7. Describe how to give a woman fluids rectally (IR) and in the peritoneal cavity (IP).
8. Describe how to give a baby fluids through a scalp vein.
9. Demonstrate general convulsion care for a woman.

Introduction

Many conditions can occur in a woman or baby requiring immediate emergency care and referral. If this is delayed the woman or baby may die. It is life-saving to reduce delay in caring for the woman or baby by quickly recognizing the condition and providing the needed immediate emergency care. This helps to stabilize the woman or baby so the condition does not become worse before more life saving care is started.

Many of the serious woman or baby problems can lead to shock. With shock, the circulation of a woman or baby does not work normally. The heart, lungs and brain do not get enough oxygen. Without immediate emergency care the woman or baby may die. The midwife must act quickly to prevent this from happening.

In this module you will learn the causes and management of shock. Because fluid replacement is such an important action in management of shock, this module puts much emphasis on ways to replace fluids. This will help you stabilize a woman or baby in shock and during referral. For the woman, you will learn how to start an intravenous infusion in a peripheral vein, how to give fluids in the rectum or peritoneal cavity, how to hydrate a woman who is able to drink using oral rehydration therapy, and how to assist with an emergency blood transfusion.

For the baby, you will learn how to give fluids through a nasogastric feeding tube, how to hydrate the baby who is able to drink using breast milk and oral rehydration therapy, and how to start an intravenous infusion in a scalp vein. Review questions and case studies help you measure your knowledge. The skills of starting an intravenous infusion on a woman and inserting a nasogastric feeding tube for a baby are included in the module content, see also *Guide for Caregivers – Skill Checklists.* The opportunities to use other methods of fluid replacement during training are not always available. These skills are explained in the **Learning Aids** for your reference and use.

A Midwife's Experience...

A 20 year old primigravida attended antenatal clinic and was advised to deliver at the hospital because of pre-eclampsia. She delivered at home, and was carried to my clinic with her newborn son. She was bleeding, felt cold, and her pulse was hard to feel. I asked someone to keep talking to her. I covered her and put her bottom and legs higher than her head (shock position) while I rubbed her uterus. The placenta delivered at home, too. After the placenta came out, the grandmother said she started bleeding. It took 4 hours to carry her to my clinic.

I showed the grandmother how to massage the uterus and I started an infusion with Pitocin. The bleeding slowed a little. BP 70/40, pulse 110, temperature 36.8° C. I told the family we must take her to the hospital. The family had no money to go. We had to carry the woman and her baby one hour to the river. The infusion infiltrated on the way. The woman was very restless. She tried to take sips of water. I got the vein again in the canoe. It took us 3 hours to get to the road to the hospital. The taxi took 30 minutes more and the infusion again infiltrated. At the hospital, the woman was taken right in to the theater (operating room). I was so happy I started to cry. The woman and her baby stayed at the hospital for 5 days. I felt confident and competent to be a LSS midwife.

LSS Midwife, Vietnam

Common Medical Terms

Arteries – carry blood from the heart to the body.

Blood Pressure – the force of the blood pushing against the walls of the blood vessel. Two numbers are measured. The **systolic** pressure is the maximum pressure during contraction of the ventricles of the heart. The **diastolic** pressure is the pressure in the vessel when the ventricles of the heart are at rest. The blood pressure of 140 / 90 = systolic pressure of 140 and the diastolic pressure of 90.

Convulsions – uncontrolled, jerking movements of the muscles and body.

Dehydration – dryness of the body when the output of water and salts is greater than the intake of water and salts.

Emergency – a time when action must be taken immediately to save a person's life. For instance, if someone is not breathing, you must help the person to breathe now so that she will not die.

Hemorrhage – abnormal bleeding (bleeding too much). Abnormal **bleeding may be seen** such as abnormal bleeding from the vagina or bleeding from a poorly tied umbilical cord. Abnormal **bleeding may not be seen,** such as bleeding into the abdominal cavity with a ruptured ectopic pregnancy or bleeding inside the baby's head with a cephalhematoma or intracranial hemorrhage.

Infiltration – fluid, such as an intravenous fluid, going into tissue instead of into a vein.

Infusion – a fluid going into the body through a vein usually when a woman or baby is too sick to take fluids by mouth.

Intraperitoneal – into the peritoneal cavity, the area that holds the abdominal organs.

Intravenous – into a vein.

Peripheral Veins – veins away from the center of the body (such as on the arms and legs).

Peritoneal Cavity – area (sac) lined by a membrane, that contains most of the abdominal organs.

Rehydration – giving fluids by any method (oral, rectal, IV, peritoneal) to replace what has been lost. Breast milk, by breast or cup, may be rehydration fluid for a sick baby.

Shock – an emergency that requires immediate care. The blood circulation of the woman or baby does not work normally. Important organs like the heart, lungs and brain do not get enough oxygen.

Anaphylactic Shock – shock with difficulty breathing and low blood pressure caused by an allergic reaction. The allergic reaction occurs when a person has contact with a substance, such as a toxin (poison) from a bee sting, a snake bite, or a medicine. For example, some people are allergic to penicillin and will go into anaphylactic shock if they receive it.

Hypovolemic Shock – when blood loss is significant and the woman or baby go into shock. This can occur in such cases as severe postpartum hemorrhage in a woman or with bleeding from the umbilical cord in a baby that is not tied correctly.

Septic Shock – shock caused by harmful germs in the blood.

Thrombophlebitis – inflammation of a vein that develops before a clot forms in the vein. The affected area may be warm to touch, painful, red, or swollen.

Veins – carry blood from the body back to the heart.

Equipment

Cloths and blankets
Pillows
B/P apparatus and stethoscope
Time piece
See procedure for specific equipment

Emergency Referral Plan

This module will help you learn how to prevent many problems and manage the unpredictable or not preventable complications that result in shock, saving the lives of women and babies. Prevention of problems includes caring for family and the community, and preparing families for referral when needed (see Module 1: **Introduction,** Pathways to Survival and to Death, Table 2).

During a woman's pregnancy, the woman and her family are asked to discuss and prepare an emergency plan for referral. With the plan they are ready if the woman or baby has a serious problem during pregnancy, birth or postpartum and needs referral. This can make things easier, help prevent delays and can even save the life of a woman or baby. The midwife also needs to be ready for any emergency and referral. Be clear about your responsibilities and the actions you will take. This prevents delays and increases a woman or baby's chance of survival.

Family Plan

Prevent Delays. A woman, her family and community are the first ones to see a problem if the problem starts at home. When a problem happens, it can become worse if there are delays in the woman or baby getting the care they need. There may be delays in knowing there is a problem, delays in making a decision to go for referral, delays in having things including money ready to go for the referral, and delays in getting to the referral place, see Module 1: **Introduction** – Pathway to Survival. Having an emergency plan can help to prevent these delays.

Make an Emergency Plan. Encourage the woman and her family to make a plan for any emergency and needed referral. Ask her to talk about the questions in the box below with her family. She may ask someone else to help her find the information. Ask the woman at each visit about preparations she and her family are making for any possible emergency.

Family Emergency Referral Plan

- Who will decide there is a problem?
- Who will decide to get help?
- Where will you go?
- How will you get there?
- How much will it cost for transportation? To see a midwife? To see a doctor?
- What money will be used to pay the cost for an emergency?
- Who will you ask to help give you care on the way?
- Who will go with the woman and baby?
- Who will give permission for the woman to travel?
- Who will be available to give blood if it is needed?
- Who will care for the home and children?

Source: Buffington, 2004.

Midwife Plan

A referral is the process of taking a woman or baby to a facility or care provider that has the skills and equipment to manage complications. Once the decision is made to refer, it is important to continue to provide life saving care until the person being referred is at the hospital or doctor. Continue to keep the woman or baby alive and in the best condition possible. Think about the actions mentioned in the box below and how you can be ready to do them quickly and safely.

Midwife Emergency Referral Plan

- Have emergency equipment and supplies, often used during referral, ready.
- Ask family member or helper to find transport.
- Ask family member(s) to bring money, stay with the woman during the transport, be willing to donate blood, and help as needed at the referral facility.
- Refer quickly and go with the woman, baby and family.
- Complete a referral form (identify problem and care given).
- Stay calm and supportive. Help the woman and family understand what is happening so they will not be too afraid or nervous. Your calm, confident approach can lower their stress and increase cooperation when care is provided.
- Give woman or baby care.

  Monitor. Check labor progress as needed (contractions and descent), bleeding, pulse, breathing and temperature.

  Keep warm but not so hot to cause sweating and loss of more fluid. If a baby is too hot, cool with water compresses. If a baby is too cool, keep skin to skin with the mother or other family member and covered.

  Protect from injury. Someone should stay close to the woman and the baby; holding and helping them during the journey to the referral site.

  Continue to give fluids. If oral fluids can be given, give ORS (or breast milk to the baby) every 30 minutes. If nasogastric or IV fluids are needed start before moving the woman or baby. Look at IV often to be sure it stays in the vein and continues to drip. Keep the IV solution container above the needle. A family member or helper can carry or hang the IV container like a necklace.

  Position. If convulsions, keep airway open by turning the woman or baby on the side so anything in the mouth can run out. If shock, keep head lower than heart. Continue critical care for the specific problem.
- Give written referral form and a verbal report to the doctor or hospital staff.

Use the Life-Saving Steps to Stabilize the Woman or Baby in an Emergency

When you first see a woman or baby with signs and symptoms of a problem, quickly decide how serious the problem is. Take action right away. This may be a life threatening emergency. With shock, the circulation of the woman or baby does not work normally. The heart, lungs and brain do not get enough oxygen.

Talk to the woman and family as you find out what is wrong. Help them feel you are trying to make the situation better. Look calm and show that you know what you are doing. This will help the woman be less afraid. Have one member of the family stand beside the woman if possible.

Use Life-Saving Steps. Shock is a life threatening emergency! When you see a woman or baby with a problem, quickly decide how sick they are. You must find out: **Is the woman or baby alive?**

Call for Help to assist you provide care.

A – **Is the airway open?** Can the woman talk? Does the baby cry?

If the woman can not talk, make sure the mouth and nose are clear and open. Lay the woman on one side with head tilted back to keep the airway open.

If the baby does not cry, make sure the mouth and nose are clear and open. Position the baby on the back with the head so it is slightly extended, in the 'sniffing position'.

B – **Breathing?** Is breathing present?

If the woman or baby is not breathing, help them breathe.

C – **Circulation?** Is the heart beating?

If the heart is not beating, help the heart beat, see Module 6: **Resuscitation.**

S – **Shock?** Is the woman or baby in shock?

LOOK and FEEL FOR SHOCK SIGNS AND SYMPTOMS			
Woman		**Baby**	
Pulse	Weak, fast (140 or above)	Heart Rate	Fast (above 180)
BP	Low (systolic below 80)		
Skin	Cold, clammy, pallor	Skin	Cold, pallor
Breathing	Fast, shallow (above 30)	Breathing	Slow (less than 20)
Brain (CNS)	Anxious, restless, weak	Brain (CNS)	Lethargy, not responsive

Finding. There is **no shock.**
Actions. If there is no shock or after you have stabilized the woman or baby for the emergency, use the problem solving method, see Module 1**: Introduction** and *Guide for Caregivers – Complaint & Findings* to identify the problem and give care.

Finding. There is **shock.**
Actions. If there is shock, stabilize the woman or baby. Give immediate life saving care. Emergency or shock treatment is needed immediately. For example, **when a woman is not breathing, you must help her breathe before finding out what is the problem.** Once she is breathing, you may continue the problem solving process. If a baby is bleeding from the cord stump and in shock, you will need to manage the shock and try to stop the bleeding at the same time.

Give Life - Saving Care

1. **Keep the woman or baby warm.** Cover, as shock can cause the body temperature to drop very low and make the shock worse. For babies, skin to skin contact and covered is the best way to keep them warm, see Figure 1.

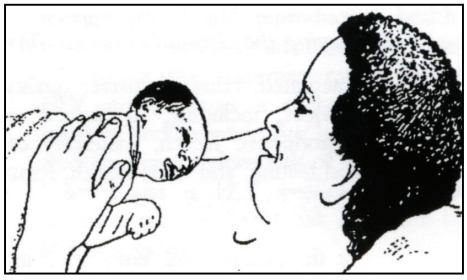

Figure 1. Skin to skin.

2. **Put in shock position.** Raise a woman's feet and legs about 10 centimeters (4 inches). Keep calm. Handle gently - body movement can make shock signs stronger (faster pulse, lower blood pressure). Reassure the woman and her family as you are giving care.

3. **Give fluids.** Do not wait. Severe shock usually ends in death. For a woman, start IV fluids if you have them. If you do not have IV fluids or if you can not start the IV, fluids can be given to the woman in the rectum, intraperitoneal (if she is not pregnant), or by mouth if she can swallow. For a baby who can not suck and swallow, use another method to give fluids such as nasal gastric feeding tube or intravenous infusion.

Identify the Cause of Shock and Give Care. Shock can have many different causes. The most common causes of shock are severe bleeding (hemorrhage), infection (septic shock), dehydration, asphyxia (not breathing), heart attack, or allergic reaction (anaphylactic shock). With shock, the circulation of the woman or baby does not work normally. The heart, lungs, and brain do not get enough oxygen. The cause must be identified and managed to prevent the condition from becoming worse. Some of the common causes of shock in the woman and baby are discussed below. See *Guide for Caregivers – Complaint & Findings.*

Common Causes of Shock

1. **Bleeding.** Hemorrhage is when a woman or baby bleeds too much. The heart tries to pump faster, but there is not enough blood, so the blood pressure goes very low and the pulse very fast. Some of the causes of bleeding in women are uterine atony, lacerations, abortion, and ectopic pregnancy. In newborns, bleeding is often caused by bleeding from the cord and circumcision. When too much blood is lost quickly, it leads to hypovolemic shock, see Module 5: **Hemorrhage**.

2. **Infection.** Septic shock is caused by infection in the blood and may happen with maternal postpartum or neonatal sepsis, see Module 7: **Infections.** A newborn baby with a low APGAR may have infection or be in shock, see Module 6: **Resuscitation**.

3. **Dehydration.** Dehydration happens when the output of water and salts is more than the intake of water and salts. People normally take in the water and salts their bodies' need through the food they eat and the fluids they drink. Normal daily fluid intake for a healthy adult woman is 2.7 liters (11 cups). For the first 6 months of life, healthy babies take in enough water, salts and nutrients with exclusive breast feeding, see Module 10: **Postpartum.**

   Water and salts leave the body through stool, urine, breathing, and sweating. When a person works hard, the water and salts are lost more quickly through sweating and breathing. When a person is healthy, water and salts pass from the bowel (intestines) into the blood. A person who is well hydrated does not feel thirsty, has clear or pale yellow urine and urinates about every 2 - 3 hours. When there is sickness, the bowel does not work normally, and less water and salt go into the blood. More than the normal amount of water and salts may be lost if the person has fever, vomiting, hemorrhage, or diarrhea. Drinking too little fluid (or a baby not able to breast feed) when sick may also lead to dehydration.

   Treat dehydration by putting fluids into the woman. If you do not have IV fluids or if you can not start an IV, use another method, see **Learning Aids 6 and 7.** Treat dehydration in a baby, by using expressed breast milk in a cup or in a nasogastric tube. Breast milk is the BEST fluid to give a baby, see **Learning Aid 8**.

4. **Other causes.**
   - Shock can happen with **newborn asphyxia**, see Module 6: **Resuscitation.**
   - If a woman has a **heart attack** she may have severe substernal chest pain lasting 15 minutes or more, difficulty breathing, nausea, vomiting, sweating, and arm, jaw pain, or back pain. Give 325 mg aspirin right away to help reduce heart damage. Give an available intramuscular (IM) analgesic and REFER.
   - If a woman has an **allergic (anaphylactic) reaction** she may have difficulty breathing, wheezing, swelling, rash, and nausea. Give an injection of 1:1000 solution of epinephrine, see *Guide for Caregivers – Procedures & Tests*. If there is swelling or itching of the skin, give an available antihistamine by injection or rectal suppository. Give fluids and REFER.

SKILL: Give Fluids to a Woman – Peripheral Vein Procedure

The skill of placing a needle into a vein and making a steady flow of fluid into the bloodstream can help you prevent shock and death. **This is a life saving skill**. Use **Learning Aid 1** as a guide to choose the type of intravenous (IV) fluid and the amount of fluid to give. If you are unable to start an intravenous infusion, see **Learning Aid 6** for putting fluids into the rectum, or **Learning Aid 7** for intraperitoneal infusion.

Equipment

- Time piece
- Adhesive tape (plaster)
- Antiseptic solution or soap and water
- Cotton, gauze, or cloth
- Clean gloves
- Waste container
- Padded arm board
- Intravenous fluid, **Learning Aid 1**
- Intravenous stand or nail in wall
- Infusion standard set -1 ml = 20 drops
- Sterile needle 20 gauge, largest gauge possible (14 – 18) if transfusion,

Procedure

1. Collect equipment. Place the equipment where you can reach it easily.

2. Cut a 3 cm piece of tape and an 8 cm piece of tape. Stick the tape to your clothes or some other place you can reach easily when you need it.

3. Wash your hands and put on gloves.

4. Explain to the woman what you are going to do.

5. Help the woman to lie in a comfortable position.

6. Connect the IV fluid to the tubing.

7. Some IV tubing has the needle attached to the tubing. If the needle is not attached, connect the covered sterile needle or catheter to the tubing.

8. Have an IV stand or nail on a wall ready to hang the IV bottle/bag.

9. Fill the tubing and needle with the IV fluid from the bottle or bag to make sure there is no air in the tubing. Clamp the tubing. Keep the sterile plastic cover on the needle until you are ready to use it. Lay the IV bottle or bag on the bed or on a table next to the bed at the same height as the woman.

10. Look for a vein. Veins are placed somewhat differently in each person. Veins are usually easiest to see on the back of the hand, the forearm, and the ankle, see Figures 2 and 3. You should look for a vein as far from the heart as possible. If your attempt fails, you can

then move further up the arm or leg. Do not use a vein that crosses a joint (such as a wrist or elbow), as a needle placed over or at a joint will move every time the joint moves and may come out. Whenever possible, use veins in the arms or hands. If the woman has late shock signs use the antecubital vein, in front of the elbow, the easiest and fastest vein to find because it is a large vein.

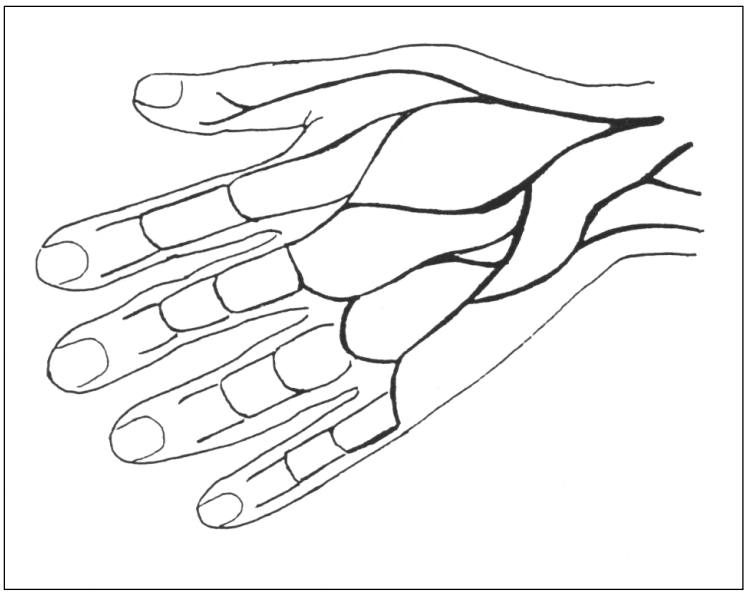

Figure 2. Veins in the hand.

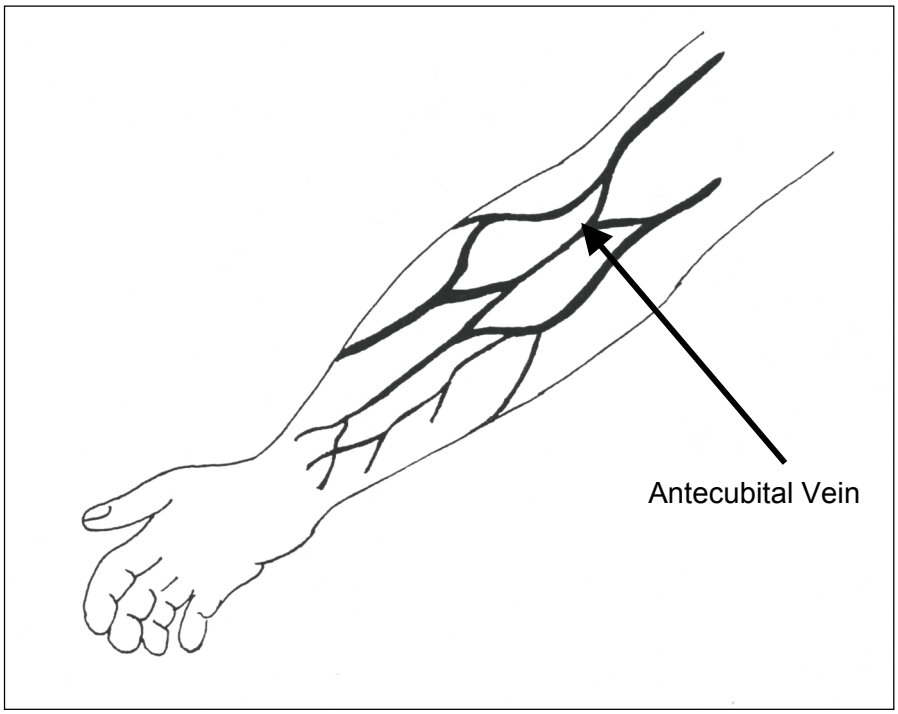

Figure 3. Veins in the forearm.

11. Place a rubber tourniquet around the upper arm, see Figure 4. You may also use a blood pressure cuff, a rubber glove, or ask an assistant to squeeze the arm by circling the arm with both of her hands to stop the flow of blood in the veins. The veins will puff up. If the woman has very low blood pressure or is losing too much blood, you may not be able to feel the veins. Place a warm cloth over the veins and pat the area gently to make the veins fill up. You can also ask the woman to open and close her fists.

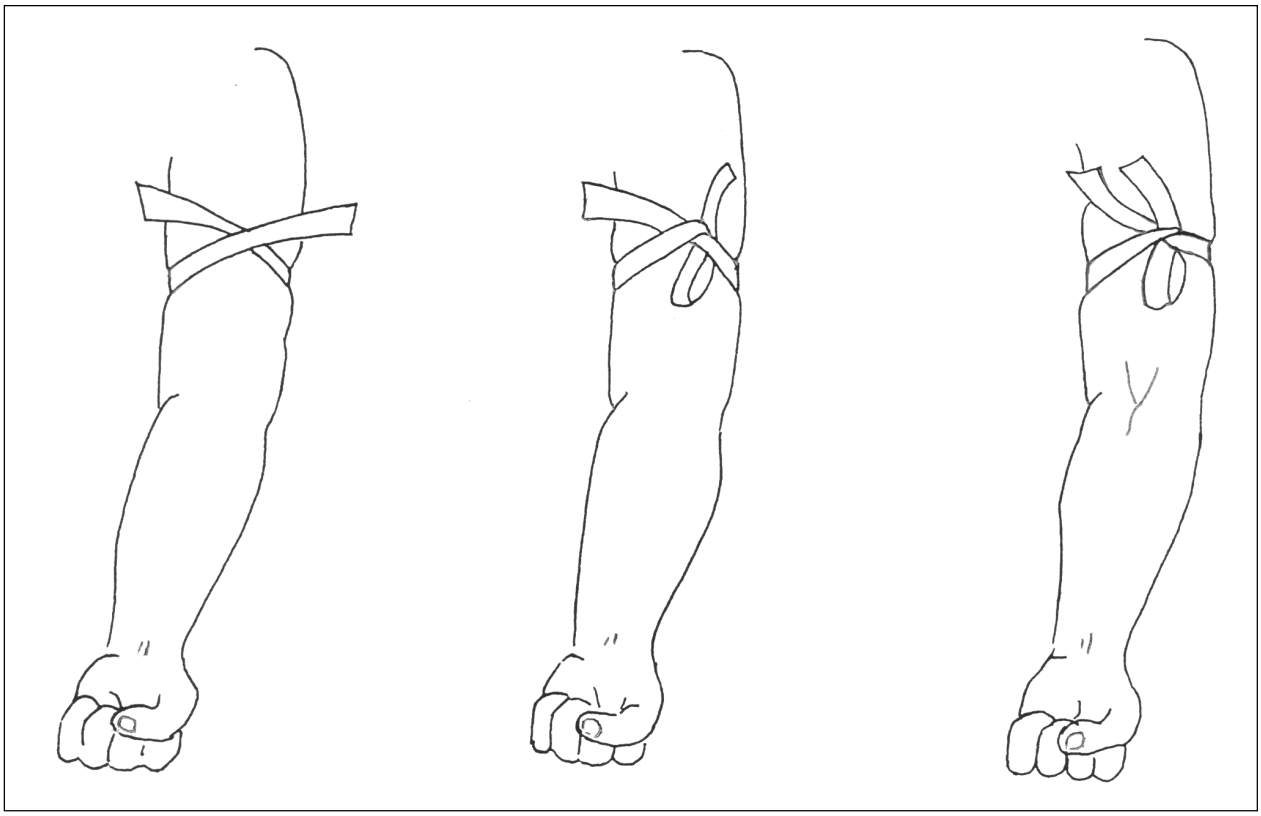

Figure 4. Applying a tourniquet to find a vein.

12. Clean the skin over the area where you found a vein, using soap and water or antiseptic solution.

13. Make sure the skin is dry to prevent pushing soap or antiseptic solution into the vein.

14. Open the tubing clamp so blood will flush (run) back into the needle and tubing when the vein is punctured by the needle.

15. Hold the needle with the hand you use for giving injections.

16. Use the thumb of your other hand to gently pull or stretch the skin over the vein and hold the limb still, see Figure 5. This prevents the woman from moving, and the stretched skin will hold the vein so that it does not move. Remember to not touch the area you have cleaned.

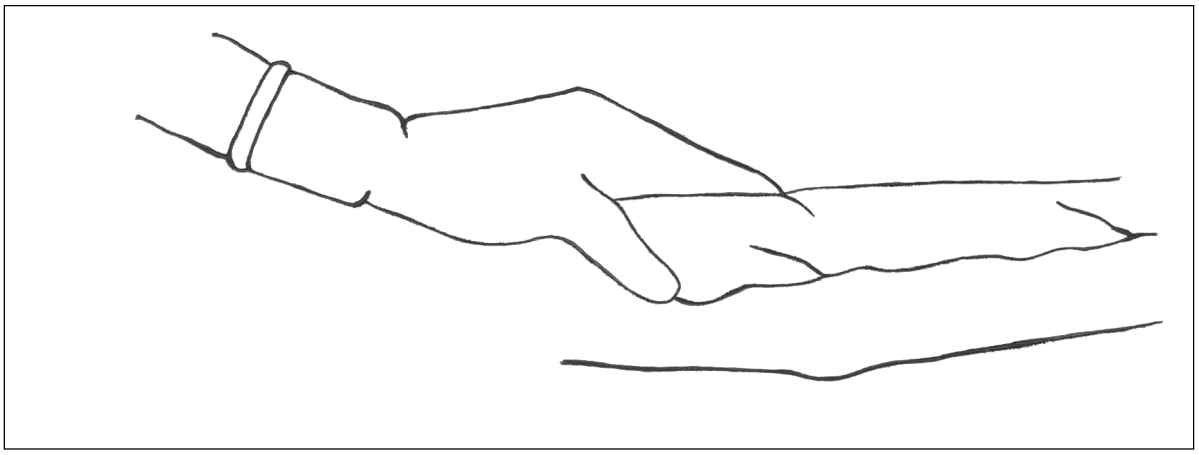

Figure 5. Pulling or stretching the skin.

17. Push the needle through the skin, about 1 cm below the point where you want it to go into the vein, see Figure 6. Position the needle along the side of the vein.

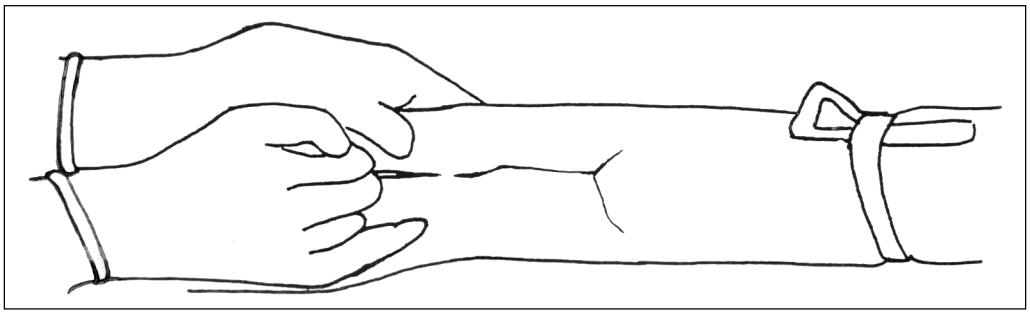

Figure 6. Push the needle through the skin.

18. Gently push the needle into the vein. Use a quick, steady push. Blood should come back into the needle or tubing. If you see no blood, gently turn the needle or push it a little more into the vein.

19. When you see blood, carefully loosen the tourniquet and hang the infusion bottle/bag.

20. Check that the needle or catheter is in the vein by slowly running IV fluid into the vein.
    - If the **area around the needle swells,** stop the flow of fluid and remove the needle. Apply pressure with cotton or gauze over the needle hole. Continue pressure until the bleeding stops. Start the procedure again further up the arm or in a different location.

    - If the **area around the needle does not swell**, and you are using an IV catheter, remove the inner needle and slowly advance the catheter into the vein. Use the 3 cm piece of tape to fasten the needle or catheter where it enters the skin.

21. Loop the 8 cm piece of tape, with its adhesive side up, under the needle. Fold each end of the tape diagonally across the needle to hold the needle in place, see Figure 7.

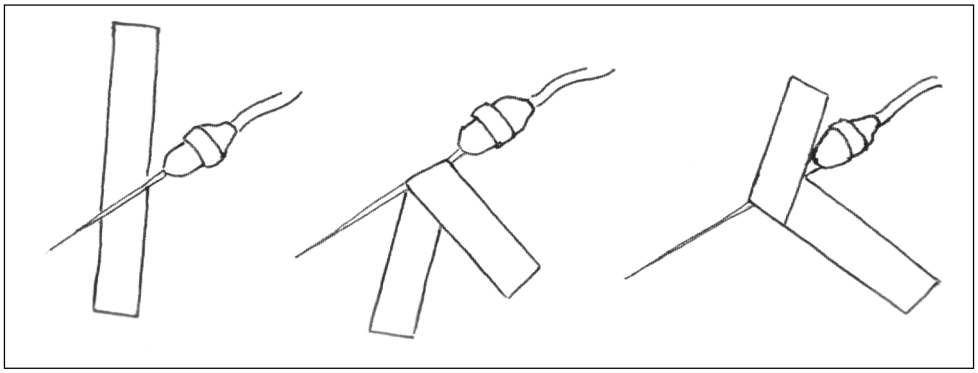

Figure 7. Tape the needle in place.

22. Check again to see that the needle is still in the vein.

23. If the IV is placed over a joint, use an arm board or a splint to keep the joint nearest the vein from moving. Place adhesive tape over the limb above and below the joint. Do not wrap the tape all the way around the limb. Make sure the tape does not stop circulation. Loop the tubing once or twice. Tape the tubing to the limb.

24. Regulate the flow, see **Learning Aid 1**. Put a piece of tape on the IV container and mark where the fluid should be each hour.

25. Check rate of flow and the needle every hour to make sure the fluid is running in the vein. To do this, lower the IV solution container below the woman's body. You will see blood come into the tubing. This means the needle is still in the vein. Sometimes with severe dehydration, the needle may not be in the vein and the IV fluid is absorbed in the tissue. It takes a while before any swelling is seen. Watch carefully for swelling. There could be fluid leaking from the needle where the needle has come out of the vein (infiltration).

26. Make sure the woman is comfortable and that someone is with her to help if needed.

27. Clean up the supplies and prepare them for the next time they are needed.

28. Record information about the IV infusion and the time started.

REMEMBER

It is important to be able to carry out all of these steps very quickly in an emergency.
Take time to practice and review the skill every 6 months.

SKILL: Give Fluids to Baby – Nasogastric Feeding Tube Procedure

A nasogastric feeding tube may be put in one nostril or the mouth. If the baby is breathing regularly, use the smallest (narrowest) tube available in one nostril. If the baby is having trouble breathing or you only have a bigger tube, put the tube in the mouth. The fluid goes down this tube into the stomach. Every midwife must be able to give a nasogastric feeding. If a baby is severely dehydrated and it is not possible to use a nasogastric tube, then start an IV infusion see **Learning 1** for rapid intravenous replacement**.**

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Nasogastric feeding tube and IV fluids are both safe and effective for uncomplicated, acute (severe), or moderate dehydration in young children. The nasogastric feeding tube works as well as an IV, is no more labor intensive than IV, and has fewer complications (Nager,2002),

Equipment

Gloves Stethoscope Adhesive tape Syringe 5 or 10 ml Breast milk, ORS or other solution	Clean IV bottle and tubing or large syringe for putting fluid in tubing Feeding tube for baby: Less than 2 kg, the smallest (size 5 French tube) 2 kg or more (size 8 French tube)

Procedure

1. Gather the equipment

2. Prepare the solution.

3. Explain to the parents and family why you will put a tube down the baby's nose or mouth.

4. Swaddle firmly to prevent baby from moving. Wrap the baby tightly in a cloth, so someone can hold the baby and so that the arms are not able to move.

5. Position the baby (head slightly bent forward) for someone in the family to hold.

6. Wash hands and put on gloves.

7. Measure the length of the tube that is needed to go from the middle of the upper lip to the ear and then to the xiphoid process at the end of the sternum.

8. Mark the tubing with a piece of tape.

9. Smooth the feeding tube with your hands to warm and soften it.

10. Put a little water on the tube so it slides easily.

11. Push the tube slowly down the nose until you reach the mark on the tubing. Never force the tubing into the nostril. If the tubing does not slide easily, try the other nostril or the mouth. If the baby is having trouble breathing, insert the tube through the mouth.

12. Tape the tube on the side of the baby's face with a short piece of tape.

13. Look in the throat with a flashlight to make sure the tube is not coiled up in the back of the throat. The bottom end of the tube must be in the stomach. If the baby coughs a lot, the tube may be in the trachea. If fluid is put into the trachea, the baby will die. If you think the tube might be in the trachea, take it out and try again. Use the following two ways to make sure the tube is in the stomach:
    a. Suck the top end of the tube with a syringe. If fluid comes, the tube is in the stomach.
    b. Use the syringe to push air into the tubing. At the same time listen with a stethescope for sounds of air in the stomach.

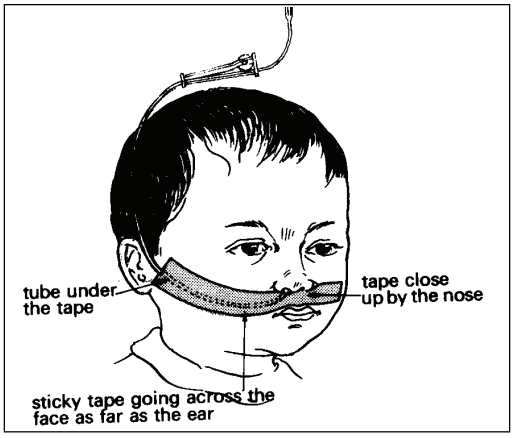

Figure 8. Tape tube.
Source King 2003

14. When you are sure the tube is in the stomach, tape the tube from under the nose to the ear so the baby can not pull on the tubing, Figure 8. Do not pull the tubing tightly against the nostril. Do not cover the nostrils.

15. Attach the top end of the tube to a drip set or syringe and start giving the fluid. Give hourly for 3 hours. If the baby does not vomit, then give every 3 hours. When a baby is very weak and sick, you may need to give every ½ hour to prevent vomiting or trouble breathing.

Amount of ORS by Feeding Tube in FIRST 12 HOURS of Treatment

Weight of Baby/Child	Total in 12 Hours	Amount Hourly	Amount every 3 Hours
2 kg (4.4 lb)	300 ml	25 ml	75 ml
3 kg (6.6 lb)	450 ml	40 ml	120 ml
6 kg (13.2 lb)	900 ml	75 ml	225 ml
9 kg (19.8 lb)	1200 ml	100 ml	300 ml
12 kg (26.4 lb)	1800 ml	150 ml	450 ml

- If the baby is alert and moving after 12 hours, give ORS by mouth. Stop the nasogastric feeding tube as soon as he can drink or suck the breast.
- If the baby is not alert or not responding and unable to suck the breast or take ORS by mouth, continue giving the same amount through the tube and refer.
    - Watch his eyes. Swelling of the eyelids is a sign of getting too much fluid.
    - If he vomits, slow the amount given at a time. Watch him.
    - If the dehydration gets worse, give fluids through an intravenous infusion.

16. Record time and amount of fluid given.

Learning Aid 1 – Intravenous Solutions: Types, Dosages, Rapid Replacement and Dangers

Intravenous (IV) solutions are given directly into a vein to help replace fluids lost by the body. Because fluids are put into a vein of a woman or baby's body, the fluids must be sterile. IV solutions containing only dextrose (glucose) are not as effective as solutions such as normal saline or Ringer's Lactate. Dextrose solution leaves the circulatory system quickly so it is less effective in increasing the circulatory volume (amount of fluids in the blood system) in someone with shock or dehydration.

WOMAN

The first fluid to give should be either normal saline (0.9% sodium chloride) or Ringer's Lactate (also called Hartmann's Solution). If you do not have these IV solutions, choose any other that you do have. **Try to keep at least 5000 ml (milliliters) of IV solution in stock in case you have an emergency,** so you can manage an emergency and give good care. Any other IV solutions in your protocols should be added to this list.

Solutions

Normal Saline (sodium chloride 0.9%, Isotonic Saline)
Give this solution when a woman is in shock or severely dehydrated.

Ringer's Lactate
Give this solution when a woman is in shock or severely dehydrated.

Dextrose 5% with Normal Saline
Give this solution to provide some energy for the body and to help maintain the body's water and salts balance.

Dextrose 5% in Water
Give this solution to provide the body with energy and water after hypovolemia has been treated. Use for shock treatment only if no other fluids are available.

If the woman is in shock (systolic blood pressure below 80; pulse above 140 beats per minute; or she is losing fluid or blood; or has high fever), she needs life saving care. Call for help, see that her airway is open and she is breathing. Start giving IV fluids right away as you decide what is causing the problem.

1. **Rapid replacement of fluids. Give IV fluid into her vein as fast as it will go.** This is called a bolus. Use the largest needle or catheter you have available, 14 – 18 gauge if possible. Watch the woman carefully for swelling around the needle site and swelling of the eyelids. You should stay beside the woman while the IV is running fast. Although most women will only need a bolus of 1000 to 1500 ml, more fluids may be given up to a maximum of 5000 ml in 6 hours or 8000 ml in the first 24 hours.

2. Take and record her blood pressure and pulse every 5 minutes while she is in shock.

3. At the same time, find the cause of her shock and try to stop it. She may be losing fluid from bleeding too much (external or internal), fever, diarrhea, or another way.

Goal for Managing Shock

- Systolic blood pressure at 80 or above, and
- Pulse below 140

4. When her systolic blood pressure is 80 or above and her pulse is below 140 slow the IV down to 150 ml per hour and REFER.

5. Mark the IV container with the hour for each 150 ml as in Figure 13. A strip of tape can be put on the length of the container and the hours marked with a pen. Watch the solution going in and regulate it to 150 ml per hour.

6. If referral is delayed, continue with the IV fluids at 150 ml per hour for 24 hours (this would be a total of 5000 ml if a bolus of 1500 ml was given very fast in the beginning). Give oral fluids and food when the woman is able to drink and eat. Explain to the family they can also watch the amount of fluid that should be going into the vein.

7. Take and record the blood pressure every 30 minutes until referral is possible.

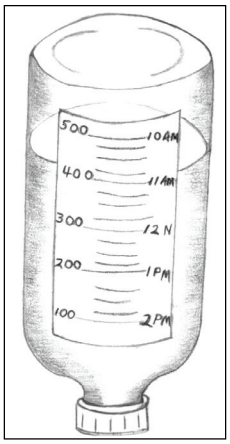

Figure 9. Mark the hour for each 150 ml.

REMEMBER

- When giving a bolus of IV fluid, stand right beside the woman during that time. Do not leave her.
- Most women improve with 1000 to 1500 ml of IV solution (normal saline or Ringers Lactate) given very fast.
- In very serious cases, you may need to give up to 5000 ml in 6 hours to improve the condition (systolic blood pressure above 80 and pulse below 140).
- In very dangerous situations where bleeding is too much or fluid loss from diarrhea (such as in cholera) is uncontrollable, you may need to give up to 8000 ml in the first 24 hours to save her life. REFER immediately as transfusion is needed when the woman is bleeding so much.

BABY

Any baby with shock or dehydration who is unable to suck or swallow will need a rapid nasogastric fluid replacement with ORS or rapid replacement with IV fluids. In dehydration due to diarrhea, IV solution of normal saline (0.9% NaCl) protects the baby against low blood sodium, (Neville, 2006). Ringer's Lactate (also called Hartmann's Solution for Injection) is used for rapid IV replacement when normal saline is not available.

First 6 hours IV rapid replacement of fluids. Give IV fluid at a rate of 30 ml/kg in the first hour, followed by 70 ml/kg in the next 5 hours, thus providing a total of 100 ml/kg in 6 hours, see page 8.15 for nasogastric feeding tube procedure.

WEIGHT	FLUID FIRST HOUR	FLUID NEXT 5 HOURS	TOTAL FLUID IN 6 HOURS
2 kg / 4.4 lb	30 ml X 2 kg = 60 ml	70 ml X 2 kg = 140 ml (28 ml/hr)	100 ml X 2 kg = 200 ml
3 kg / 6.6 lb	30 ml X 3 kg = 90 ml	70 ml X 3 kg = 210 ml (42 ml/hr)	100 ml X 3 kg = 300 ml
6 kg / 13.2 lb	30 ml X 6 kg = 180 ml	70 ml X 6 kg = 420 ml (84 ml/hr)	100 ml X 6 kg = 600 ml
9 kg / 19.8 lb	30 ml X 9 kg = 270 ml	70 ml X 9 kg = 630 ml (126 ml/hr)	100 ml X 9 kg = 900 ml

After the first 30 ml/kg is given, a strong wrist pulse should be easily felt. If it is still very weak and rapid, a second infusion of 30 ml/kg should be given at the same rate, however this is rarely necessary. **Give ORS** in small amounts by cup (about 5 ml/kg/hour) as soon as the baby is interested to suck or drink from cup, this is usually possible after 3 - 4 hours.

REASSESS THE WOMAN OR BABY

Identify cause of shock and manage according to protocol. LOOK at progress at least hourly while giving fluids, until there is definite improvement. Focus carefully on:

- WOMAN: systolic blood pressure, pulse, and any difficulty giving fluids.
- BABY: signs of dehydration (sunken eyes or fontanelles, loss of skin elasticity (turgor), dry tongue and mucous membranes), number and type of stools passed, color and amount of urine passed and any difficulty in giving fluids.

Signs of a satisfactory response:

- WOMAN: systolic blood pressure above 80 and pulse below 140, responding.
- BABY: return of a strong wrist pulse, improved level of consciousness, increased ability to suck or drink from a cup, much improved skin turgor and passage of clear urine. When these are seen, check every two hours.

Signs of shock or dehydration remain unchanged or become worse, and for baby especially, if several watery stools are passed, REFER. The rate of fluid may need to be increased if referral is delayed.

Dangers of Giving Fluids in the Vein

Dangers of IV therapy can be either local (at the place of the injection) or general (throughout the body).

Local Problems happen more often and must be cared for right away to prevent serious problems.

- Irritation to the wall of the vein can cause infection of the vein (thrombophlebitis). To prevent this: (a) avoid many needle sticks into the vein, (b) avoid veins in the lower limbs (legs), and (c) avoid veins that are small and crooked. If the area around the needle gets painful, swollen, or hot to touch, clamp the tube and remove the needle right away. Start the IV in another area of the body.

- Infiltration of the IV fluid. This happens when IV fluid leaks into the tissue either because the needle moved or goes through the vein. Infiltration can be prevented by adequate taping of the needle and splinting of the site and careful and frequent checks of the needle and the IV fluid. If there is a swelling at the injection area, clamp the tube and remove the needle right away. Restart the IV in another place.

General Problems are a more serious threat to the life of the woman or baby. They happen less often than the local problems, but the midwife must know about them and watch carefully to prevent them.

- Infection of the blood happens when germs are allowed to go into the bloodstream. This must be prevented by using sterile needles, tubing, and IV fluids, see Module 7: **Infections.**

- Giving too much IV fluid too fast when it is not needed can cause the heart to weaken (heart failure) and the lungs to fill up with fluids (pulmonary edema) because there is too much fluid in the blood vessels. This can be prevented by giving IV fluids at the rate recommended. The midwife must also remember to watch for swelling of the eyelids when giving IV fluids. This is a sign of too much fluid.

- Giving too little IV fluids too slowly. It is common for shock patients to receive their IV fluids too slowly or incase of the baby nasogastric fluids. A slow running drip overnight is a common reason for a dead patient in the morning.

REMEMBER

Run IV fluids at the speed that you want the IV to run (not too fast or too slow).

Never leave a woman or baby with an IV alone until she is responding well.

Learning Aid 2 – Oral Rehydration Solution (ORS) from a Packet

Look at your Oral Rehydration Solution (ORS) packet. Read the directions. Find out how much clean drinking water you must measure into a clean container. Use the cleanest drinking water available. Pour all the ORS powder from one packet into the water and mix well until the powder is completely dissolved. Taste the solution before giving it to the woman or baby. Remember the **solution should never taste saltier than tears**. Mix fresh ORS each day in a clean container.

A dehydrated adult should take at least 2000 ml (2 liters) of ORS solution in a day.

Advise the woman to take other fluids or ORS as much above 2000 ml as she wants in a day. Sometimes while you give the woman an IV infusion, she will ask for something to drink. ORS is an ideal drink while the woman is recovering from dehydration because she needs the salts and water. If the woman does not like the taste of the ORS, add some citrus juice (orange, lime, lemon) to change the taste.

Explain to the woman and her family the importance and need for her to drink liquids to prevent dehydration. Show them how to make the ORS. Have them show you how they will mix it so you can be sure they are mixing it correctly. Explain that ORS can be used to replace lost fluid, especially from diarrhea.

A dehydrated baby that can drink and swallow needs breast milk and/or ORS.

If a breast feeding baby is only mildly dehydrated, tell the mother to breast feed frequently and for longer at each feed. Also explain that she should give other fluids like ORS. For a baby who has more than mild dehydration, give the ORS at least six times in a day and more often if possible. **During 24 hours the baby needs as many cupfuls (200 ml) of ORS as her weight in kilogram (kg).** For example, a 5 kg baby needs 5 cupfuls (1000 ml) of ORS in 24 hours. Too little fluid will not help.

Tell the mother and family to let the baby drink as much as he wants but at least 5 cupfuls. If the baby is not able or willing to drink, see the *Guide for Caregivers - Formulary* for amounts to give when using a nasogastric feeding tube. If nasogastric feeding is not possible, give IV fluids according to the amounts explained in **Learning Aid 1**.

Sometimes a baby or woman may vomit the ORS.

When you see vomiting, try to find out the answer to these questions.

- How often and how much fluid is vomited?
- How much ORS is the baby or woman drinking?
- Is the dehydration getting better or worse?

Give small sips of ORS often. If the baby or woman drinks more than they vomit, most of the fluid is staying inside. Watch carefully to make sure the dehydration is not getting worse. Record the time and amount of fluids taken, urine or stool passed, and vomiting.

Learning Aid 3 – Preparing Sugar and Salt Solution

There may be times when the woman or baby can take fluids by mouth and you do not have any locally available liquids or the ORS packet. You can make a sugar and salt solution. There are different ways of making sugar and salt solution. If your way is not written here in this module, add it at the bottom of the page.

1. You will need boiled drinking water, sugar, salt, a container to measure (such as a soft drink or a beer bottle), a container for mixing, a cup, and a teaspoon.

2. Wash your hands. Wash all utensils so they are clean. Take the measuring container and measure 1000 ml (l liter) of drinking water. Pour this water into the container for mixing.

3. Add 8 level teaspoons of sugar and 1/2 level teaspoon of salt to 1000 ml of drinking water.

4. Stir the mixture well. Taste the mixture. **Sugar and salt solution should never taste more salty than tears.** Pour the mixture into a cup. Give the solution to the woman or baby to drink. **Use the same dose as for ORS described in Learning Aid 2.** If the woman or baby does not like the taste, add citrus fruit juice to the solution.

5. Mix fresh solution every day in a clean container. Record the amount of fluid taken.

6. Explain to the woman and her family the reason to drink liquids is to prevent dehydration. Show them how to make sugar and salt solution. Have them show you how they will mix it so you can be sure they are mixing it correctly. Explain that sugar and salt solution can be used to replace lost fluid, especially from diarrhea.

Learning Aid 4 – Convulsion Care for a Woman

Convulsions are uncontrolled, jerking movements of the muscles. Many times there is loss of consciousness. Convulsions come from an irritation to the brain. Convulsions may be caused by pregnancy (eclampsia), poisoning, infection (meningitis), high fever, severe dehydration, hypoglycemia, and other problems. A convulsion may last from a few seconds to many minutes. Many pregnant women who have convulsions will die or lose their babies. **A convulsion is an emergency.** Give the woman quick and careful treatment. Call for help.

Convulsion Care for Women

1. Stay calm and reassure the family.

2. Clear Airway: Keep a clear airway by helping the woman to lie on her side on the floor or a flat surface so that anything in her mouth can run out.

3. Protect From Injury: Keep the woman from hurting herself by moving away hard or sharp objects. Do not try to stop the jerking movements, but make sure she does not hurt herself. Do not put or pour anything into the woman's mouth as she is not able to swallow. Do not leave the woman alone.

4. Treat Cause: Try to find out the cause of the convulsion and treat the cause, if possible. See Module 2: **Antenatal** for identification of pregnancy induced hypertension. See *Guide for Caregivers – Emergency Treatment & Protocols* while waiting for referral and during referral:

Treat Eclamptic Convulsions

- Give magnesium sulfate ($MgSO_4$) solution 20% - 4 grams (or dilute 8 ml of 50% $MgSO_4$ solution with 12 ml sterile water). Give IV slowly over 10 minutes. Also give 10 gm 50% $MgSO_4$ solution IM deep (5 gm each buttock). If convulsion recurs after 15 mins give 2 gm of 50% $MgSO_4$ solution IV over 5 minutes. If unable to give IV, give two 7.5 gm 50% $MgSO_4$ solution IM deep in each buttock
- Go with woman to doctor/hospital. Every four hours give 5 gm 50% $MgSO_4$ solution into alternate buttocks until reaching hospital unless respiration below 16 per minute, no reflexes, no urine output. If respirations stop, give calcium gluconate 1 gm (10 ml of 10% solution) IV slowly and see Module 6: **Resuscitation**.

  Note: If no $MgSO_4$, give diazepam 10 mg IV slowly over 2 minutes or 20 mg IM. If convulsions recur, repeat diazepam. Do not give more than 100 mg in 24 hours.

After the convulsion, the woman may be confused and sleepy. Go with her to the doctor or hospital as soon as possible after the convulsion. Be prepared for more convulsions on your way to the hospital. Do not move her too quickly. On the way keep her warm and protect her from injury. Explain to the woman and her family what you are doing. Tell them you are doing everything you can to help the woman.

Learning Aid 5 - Assist with Emergency Autotransfusion

Blood transfusions may be life saving in cases of extreme blood loss.[1] The decision to transfuse blood or blood products must be based on a careful assessment. It should be used to save a life or to prevent major morbidity. Blood not obtained from appropriately selected donors and/or not appropriately screened for germs should not be transfused, other than in the most extreme life-threatening situations.[2]

An Obstetrician's Experience...

> *I have used this technique (replacement transfusion) in women with freshly ruptured ectopic pregnancy for many years with great success. I emphasize **freshly** ruptured - within 6 to 12 hours. I do not use anticoagulant as the blood does not clot in ruptured ectopic. If it does clot, then it must come from another source (pelvic vessel or uterus).*
>
> *Obstetrician, Southern Africa[0]*

Autotransfusion is giving the woman a transfusion with her own blood. Sometimes it is called recycling blood, as described here, is only suggested for the extreme situation where there is abdominal surgery and no other choice.

Why Transfuse?

To replace blood to keep the woman alive. The woman has lost so much blood that she does not have enough blood cells remaining to transport oxygen around her body. Volume of blood can be replaced by intravenous fluids; only red blood cells in blood can replace oxygen carrying red blood cells.

Remember that any amount of blood loss may be significant to an individual woman. If a woman has a hemoglobin of 5 gm and loses 500 ml of blood, the blood loss is more significant for her than for a woman with a hemoglobin of 12 gm with the same 500 ml blood loss. Blood transfusion is necessary when the loss is significant for the woman.

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[1] Blumberg (1978). This article is based on the use of uncross-matched blood for emergency transfusion in large civilian teaching hospital. It showed that 49 transfusions were given as un-cross-matched, group-specific (ABO and Rh) blood in emergencies. Seventy-seven percent of blood requests were for patients with trauma, massive intraoperative hemorrhage, or ruptured aneurysm. There were no adverse effects noted even though complete serologic testing had not been done. While the use of un-cross-matched blood is usually safe, the potential for serious reaction exists. Overuse should be discouraged.

Poeschl (1992). This article is based on experience in a district hospital in Malawi where patients were transfused with their own blood (autotransfusion) collected from the peritoneal cavity in 25 cases of ruptured ectopic pregnancy. All of them survived without adverse effects. In some cultures blood donation is the source of fear or taboo, in others the infusion of blood is prohibited by religion. Therefore autologous blood transfusion may be a useful method of overcoming some of these objections.

[2] WHO (1989). Global Blood Safety Initiative: Guidelines for the Appropriate Use of Blood.

When?

During abdominal surgery, like cesarean section, ruptured ectopic, or ruptured uterus, when the blood loss can be too much and the condition so serious that the woman will die without immediate help.

Where to Collect Blood?

Blood can be collected from the peritoneal cavity of the abdomen during surgery for a **freshly** (within the last 6 to 12 hours) ruptured ectopic or ruptured uterus. One person should manage the collection using all sterile techniques available. **Remember this is a life saving procedure.** The contamination and any resulting infection can be managed once the woman continues to live. If the blood just runs on the floor or is soaked up by cloths or gauze, the woman will not have a chance to use her own blood to be able to live.

How?

1. Collect the fresh blood from the woman in a sterile container like a stainless steel pitcher or bowl. Do not use a syringe as this can break the red blood cells and the transfusion will not help the woman. Take care when handling the blood. If the red blood cells are broken, they can not carry oxygen which is the most important need.

2. Gently pour and filter the blood through a funnel containing sterile gauze or an abdominal pack to strain out any clots. Do not shake the blood.

3. Gently pour the filtered blood into a transfusion vacuum bottle or bag containing 120 ml of acid-citrate/dextrose solution as anticoagulant.

4. Attach an intravenous set. Use a blood transfusion set, if available, because the filter will stop very small clots from entering the circulation.

5. Attach the blood transfusion tubing to a large IV needle that is inserted into the woman.

6. Run the blood in fast. Take the blood pressure and pulse rate every 10 minutes. IF the blood is donated from another source, observe for signs of transfusion reaction that may range from a skin rash to anaphylactic shock. **There is no need for cross match when the transfusion is the woman's own blood.**

7. All persons helping with this procedure must be protected against exposure to blood borne diseases by wearing protective clothing: apron, eye protection, and gloves.

8. Record amount of blood and the time it was given.

A Midwife's Experience. . .

In the operating room, I have used a sterile stainless steel pitcher to dip (remove) blood out of the peritoneal cavity, gently returned it to a transfusion bottle, and reinfused it to the woman. She did live and did not have an infection.

LSS Co-author

Learning Aid 6 – Rectal Fluids for a Woman

If the woman is too sick to drink, or the midwife is unable to give IV fluids, or if no IV fluids are available, fluids may be given rectally. The woman with severe bleeding will be dehydrated and her body will absorb the liquid. This may save the woman's life. This is a life saving skill.

Equipment

Enema container with tubing Cloth to serve as a pad under the buttocks Soap and water to wash hands Gloves	Fluid: 500 ml of room temperature drinking water with a pinch of salt (1/4 teaspoon), ORS, IV fluid such as normal saline

Procedure

1. Gather the equipment.

2. Tell the woman what you are going to do.

3. Wash your hands and put on gloves

4. Ask or help the woman to lie on her left side if at all possible with her top leg bent at the hip and knee. The water then flows into the sigmoid and descending colon, helping with absorption of fluid. Position the lower part of her body a little higher than her head if in shock. Place a cloth pad under her buttocks to catch any fluid that might run out.

5. Lubricate the end of the tubing so it will slide through the anus without irritation.

6. Run water to the end of the rectal tube and clamp off. Ask the woman (if conscious) to take a deep breath and let the air out slowly. This will help her relax and not try to push the rectal tube out. Place the tube so it touches the anus for a moment, then insert the rectal tube into the anus slowly and gently.

7. Push the rectal tube no further than 10 cm (4 inches) into the rectum.

8. Hold the bag of fluid about the level of the woman's hips for the fluid to run slowly into the woman. The water should run very slowly, so the woman does not get abdominal cramping or feel the urge to push water out. It usually takes about 20 to 30 minutes for the water to run into the woman.

9. When 500 ml has run in, remove the rectal tube gently.

10. Help the woman to breathe deeply and relax. Remind her to try to hold the water in. The water will absorb soon and she will not have the urge to push or go to the toilet.

.

11. Clean and dry the woman.

12. Clean up the equipment.

13. Remove your gloves and wash your hands.

14. Record the fluid intake and time given.

15. If it is not possible to get an IV infusion running, the woman can not drink, and referral to a doctor or hospital is delayed, the rectal fluids can be repeated after 1 hour.

16. Make every effort to find transportation and take the woman to a doctor or hospital for continued care.

REMEMBER

Once some of the fluid absorbs, it may be possible to start an IV infusion, as the veins will be fuller and easier to enter.

Learning Aid 7 – Intraperitoneal Fluids for a Woman

If the midwife is unable to give IV fluids or put fluid into the rectum, or if the woman is unable to keep the fluid in the rectum, IV fluids may be given into the peritoneal cavity. If the woman is in shock, it is not advisable to give fluids by mouth, even if she is thirsty. She may vomit and aspirate. When she has absorbed some fluids from the peritoneal cavity and signs of shock are less, oral rehydration therapy can be started. See **Learning Aid 2**, for information on oral rehydration therapy. Intravenous fluid given into the peritoneal cavity may save the woman's life. This is a life saving skill. Use this method only if the woman is in shock and if you can not give fluids in the vein or rectum. **Do not use for a pregnant woman.**

A Midwife's Experience...

A grand multipara was carried in, in the early morning. She had delivered at home and had a very severe postpartum hemorrhage. We could not find her pulse or blood pressure. It was impossible to start a drip (IV infusion) on her.

I took the largest needle I could find and inserted it into her peritoneal cavity. I ran in one liter of fluids as fast as they would go. Several minutes later I was able to start an IV infusion in her arm. We saved her life!

Many years ago, I can remember putting fluid into the peritoneum. I don't know why we got out of the habit (practice) of using this life-saving procedure. I have used it twice since the training (Life-Saving Skills), and both times the woman lived.

LSS Midwife, Nigeria

Equipment

Antiseptic or soap and water
Adhesive tape, 1 or 2 pieces 10 cm long
Gauze pads (2 x 2)
Gloves
Sterile IV tubing with clamp
Sterile needle, largest possible, 14 to 18 gauge (smaller needles take longer in giving the fluid)
Intravenous fluid at room temperature: normal saline or Ringer's Lactate, do not use dextrose solutions

Do NOT use this method for a woman who is pregnant.

Procedure

1. Gather the equipment.

2. Tell the woman what you are going to do.

3. Connect the IV fluid to the tubing. Fill the tubing and needle with fluid. Clamp the tube. Keep the needle sterile.

4. Help the woman to lie on her back.

5. Wash hands and put on gloves.

6. Clean the abdomen well with an antiseptic or soap and water.

7. Feel the abdomen to make sure it is soft. If the abdomen feels hard or tender to touch (such as with an abdominal infection or ascites), do not give the fluid in the peritoneal cavity as the fluid may not absorb.

8. Pinch the skin of the abdomen just below the navel (umbilicus) in the midline with your non-injecting hand.

9. Push the needle horizontally to the woman's body through the skin.

10. Ask your assistant to unclamp the tubing so the fluid will run as soon as the needle enters the peritoneal cavity.

11. Turn the needle from horizontal to vertical and slowly and firmly push the needle into the peritoneal cavity. As soon as the needle has entered the peritoneal cavity, the fluid will run. The stream of fluid will push the internal organs out of the way of the sharp needle.

12. Tape the needle to the abdomen so it does not move. Wrap cotton wool or gauze around the needle so it stays at about a 45 degree angle and the fluid is freely running. Loop a 10 cm piece of tape, with its adhesive side up, under the needle. Fold each end of the tape diagonally across the needle to hold the needle in place.

13. Run 500 ml of IV fluid into the peritoneal cavity as fast as it will go, usually about 10 to 15 minutes. The fluid will absorb through the intestines and pass into the bloodstream at a slow rate. Since you are running the fluid into the peritoneal cavity where absorption is controlled by the body, the rate of flow can be fast.

14. Remove the needle after the 500 ml has run into the peritoneal cavity.

15. Cover the puncture site with a dry gauze dressing.

16. Help the woman get comfortable, she may feel sleepy.

17. Clean up your equipment.

18. Remove gloves and wash hands.

19. Record the amount of fluid and time given.

The danger of the woman getting an abdominal infection (peritonitis) is very low when compared to the woman dying from dehydration or shock. It is very important for the midwife to use sterile equipment, sterile IV fluid and good aseptic technique, see Module 7: **Infections.**

NOTE: The procedure can be repeated every 4 hours if you still can not get an IV infusion started and the woman can not take ORS by mouth. Make every effort to get transportation for the woman to get to a doctor or hospital for continued care.

Learning Aid 8 – Give Fluids to a Baby – Scalp Vein Procedure

Because babies have much less fluid volume, even small decreases need immediate care to prevent life threatening problems. Babies are at special risk of becoming dehydrated and hypoglycemic.

Signs of Dehydration in a Baby

Mild	Slightly dry mouth, increased thirst, slightly decreased urine output
Moderate	Dry mouth, fast pulse, little or no urine output, lethargic, sunken eyes and fontanelles, no skin elasticity
Severe	Same as moderate with very fast and thready pulse, low blood pressure, no tears, cyanosis, rapid breathing, coma

The amount of fluid they take in and lose must be carefully watched. Give fluids to make up for all losses. First try to encourage a baby to breast feed, or if unable to breast feed, express breast milk and give with a cup. If breast milk is not available, try to give oral rehydration solution (ORS) by cup.

If the baby has signs of mild or moderate dehydration, give ORS with cup. See **Learning Aid 2** for Oral Rehydration Solution from a Packet (Sachet) and **Learning Aid 3** for Preparing Sugar and Salt Solution.

If the baby is severely dehydrated, the replacement fluids need to be given rapidly by nasogastric tube or intravenously. These are equally safe, effective, and low cost alternatives for treatment of severe dehydration in babies, (Nager, 2002), although the nasogastric tube has fewer complications. Babies usually have good veins on their scalps. Scalp vein infusions rarely become infected, are safe, and are quick to start. You can use the sterile disposable scalp vein set with a 'butterfly needle', see Figure 8, or you can use a regular intravenous set and a small needle (25 gauge, ½ inch). **Starting an IV in a scalp vein is another important life saving skill.** Start IV fluids when the baby is dehydrated due to loss of body fluids because of bleeding, infection, diarrhea or shock. Use **Learning Aid 1,** as a guide for choosing the type of IV fluid and the amount of fluid to give.

Equipment

Antiseptic or soap and water
Adhesive tape, 1 or 2 pieces 10 cm long
Cotton, gauze, or cloth
Gloves
Infusion set with clamp:1 ml = 60 microdrops

Scalp vein butterfly or 25 gauge ½ inch needle
Intravenous fluid, **Learning Aid 1**
Intravenous stand or nail in wall
Waste container

Procedure

1. Collect equipment. Place the equipment where you can reach it easily.

2. Cut two 3 cm pieces of tape and an 8 cm piece of tape. Stick the tape to your clothes or some other place you can reach easily.

3. Decide how much the baby weighs and then use **Learning Aid 1** to decide how much fluid to give.

4. Wash your hands and put on gloves.

5. Explain to the family what you are going to do.

6. Position the baby on a clean surface. Swaddle the baby tightly so that someone can hold him and prevent body movement.

7. Connect the IV fluid to the tubing with a microdropper. Never use an adult IV set to attach a large bag of IV fluid to a baby. When using an adult set, the fluid runs too fast, the whole bag may go in too fast and could cause death from too much fluid too fast. Always use a microdropper IV set. If you do not have a microdropper, use a syringe to inject the measured amount. In an emergency, give a fluid bolus of normal saline (20 ml/kg body weight and repeat if needed) as initial therapy as soon as the needle is in place.

8. Some IV tubing has the needle attached to the tubing. If the needle is not attached, connect the covered sterile needle or butterfly needle to the tubing, see Figure 10.

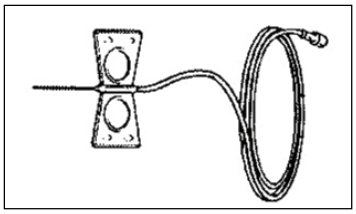

Figure 10. Butterfly needle.

9. Hang the IV fluid on an IV stand or a nail.

10. Run the IV fluid through the tubing and needle to remove the air. Air embolism can happen easily in babies and cause death. Clamp the tubing. Keep the sterile plastic cover on the needle until you are ready to use it.

11. Look for a vein. The best scalp veins are usually above the ears. If severe dehydration or shock symptoms, a scalp vein is the easiest and fastest to find.

12. If the veins are hard to see, ask a helper to press the skin around the insertion site or use a rubber band as a tourniquet on the head. Make sure you find a vein and not an artery. Feel with your finger. If it is an artery you can feel it pulsating. If you can not find a good vein, make the child cry, or rub his skin with alcohol (spirits), or heat the skin with a warm wet cloth.

13. Clean the skin over the area where you found a vein, using soap and water or antiseptic solution.

14. Make sure the skin is dry to prevent pushing soap or antiseptic solution into the vein.

15. Lay the IV bag or bottle and microdropper IV set (or syringe filled with fluid attached to a needle) on the bed or table at the same height as the baby.

16. Open the tubing clamp so blood will flush back into the tubing when the vein is punctured by the needle.

17. Hold the needle with the hand you use for giving injections. If you are using a small needle, you may hold it with an artery forceps. If you are using a butterfly needle, squeeze the 2 "wings" together to stabilize the needle. Use the technique that is easiest for you to do, Figure 11 and Figure 12.

18. Press with a finger of your other hand just below the place where you want to put the needle, so as to make the vein swell, Figure 11.

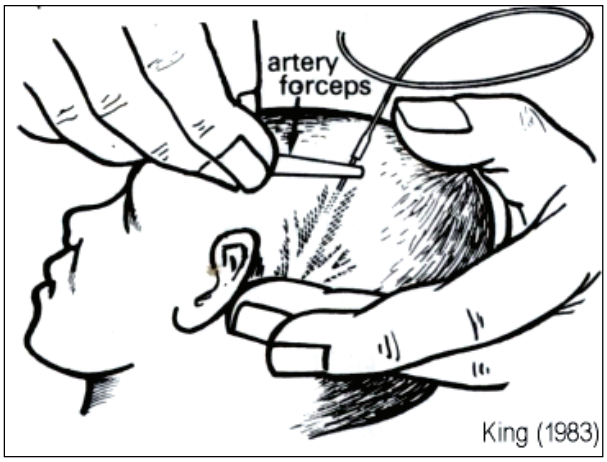

Figure 11. Press with a finger.
Adapted from illustration from King, 1983.

Figure 12. Butterfly needle along side the vein
Source: Fotosearch, 2007.

19. Push the needle through the skin at a 15 degree angle and along the side of the vein, Figure 12.

20. Push the needle carefully into the vein. As soon as the needle is in the vein, a small amount of blood will come out into the needle and tubing. (**Note:** If by mistake the needle is in an artery, the blood will pump out quickly up the tube. Take the needle out, press hard with gauze to stop bleeding. Try another place.)

21. Do not push the needle any farther. Remove the pressure or tourniquet. Hang the infusion bag or bottle on the IV stand or nail. If using a syringe, slowly and steadily push the fluid at the rate described in **Learning Aid 1.**

22. Watch the fluid run into the vein. The fluid should run freely and there should be no swelling around the needle.

23. If the area around the needle swells, stop the flow of fluid and remove the needle. Apply pressure with cotton or gauze to the needle hole. Continue pressure until the bleeding stops. Start the procedure again in a different location.

24. If a small needle was used, put a piece of gauze with a cut in it under the needle, see Figure 13.

25. Put the short tape on the skin over the needle and gauze or the butterfly wings. (**Note:** Do not cover the point where the needle goes in the skin. You need to see if fluid is coming out or if there is swelling of the tissue.)

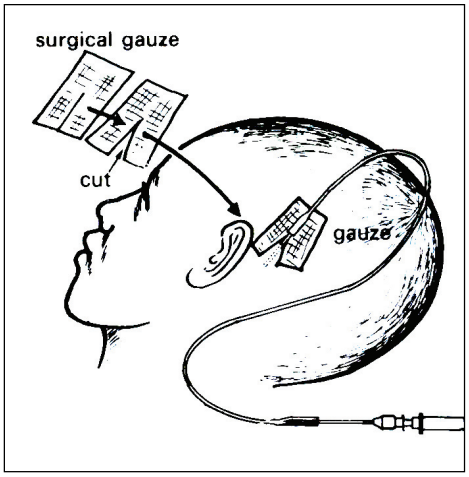

Figure 13. Gauze under needle.
Adapted King, 1983, pg 127.

26. Place the long tape under the tubing close to the needle or butterfly wings. Fold the tape from each side back to cross over each other above the short tape. Use remaining tape to place on top of the first piece of short tape to hold the crossed tape in place, see Figure 14.

27. Put a piece of tape on the IV container to mark where the fluid should be each hour, see **Learning Aid 1** for amounts to give according to body weight.

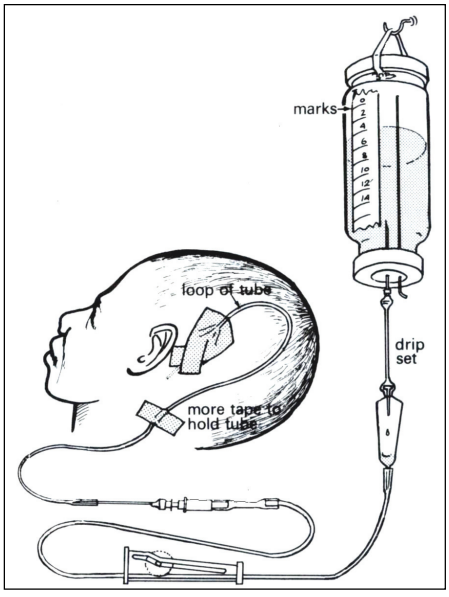

Figure 14. Tape to hold needle and tubing.
Adapted King,1983, pg 127.

28. Never leave the baby alone. Ask the mother or family to stay and watch the baby, so he does not pull out the needle. Show the mother and family how fast the drip should be and ask them to call you immediately if the fluid is dripping too fast.

- The amount of intravenous fluid is as important as the dose of a medicine.
- If a baby gets too little fluid too slowly, he will die from dehydration. Too much fluid too quickly will also kill him.
- When the baby responds, ask the mother to breast feed. If the baby is unable to breast feed, offer expressed breast milk or glucose solution by cup or nasogastric tube.
- Look at the insertion site every hour.
- Stop the infusion if redness or swelling is seen at any time.
- Watch for swelling of the eyelids, a sign of too much fluid. Slow the rate of the IV infusion.
- If the baby was dehydrated with reduced skin elasticity, this should be corrected by the fluid therapy. Feel for urinary bladder filling by palpating the bladder and noting any urine output before deciding on further fluid therapy. REFER to the doctor or hospital as soon as possible.
- Record time and amount of fluid given.

Review Questions

What Did I Learn? Find what you know and understand from this section. Answer the following questions. When you are finished, look for the answer in the module on the page written in parentheses ( ).

1. List the life saving steps you will take to help a woman or baby who is in shock (pages 8.7 - 8.9).

   Woman:

   Baby:

2. Describe the steps of starting an IV infusion using a woman's peripheral vein (page 8.10).

3. Describe how you will counsel a woman and her family about preparing a Family Emergency Referral Plan (page 8.5).

4. Describe what you need to do for a woman who needs emergency referral (page 8.6).

5. List three common dangers of giving fluids in the vein (page 8.20).

6. Describe how you will give fluid to a woman in her rectum (pages 8.26).

7. Describe how you will give fluid to a woman in her peritoneal cavity (pages 8.28 - 8.30).

8. Describe the steps of the nasogastric feeding tube procedure. How much ORS will you give to a 6 kg baby every hour? How do you decide the baby can take ORS or expressed breast milk by mouth? How will you decide when the baby can breast feed (pages 8.15 - 8. 16)?

Case Study - Problem Solving Method

The Problem Solving Method is an organized way of giving care to a woman or baby. It is a way of thinking about the care you give women. In this case study, you will use the Problem Solving Method to decide how to care for a woman who has an emergency. Read the case study. You may need to refer to modules 1, 5, 7, and 8 for information in this case study.

The 5 steps of the Problem Solving Method are:

1.

2.

3.

4.

5.

Check your answers by looking in Module 1.

ASK and LISTEN

You see Mrs. C.A. at your maternity. She tells you she is bleeding and has abdominal pain. What do you **ASK** Mrs. C.A.?

See Module 5.

You find out that she had her last menses 14 weeks ago. She has lower abdominal pain, started bleeding 3 days ago and passed clots and tissue. She feels cold and nervous. She has not taken any medicine.

LOOK and FEEL

What examination do you do on Mrs. C.A. using the **ASK and LISTEN** information?

See Module 5.

You find her BP 80/40, pulse 150 and weak, temperature 39°C (102°F). She has lower abdominal tenderness with a contracted tender uterus. She has expelled clots and tissue and has a foul smelling bloody purulent (pus) vaginal discharge, closed cervix, hot skin, and cold and moist hands and feet. She is restless.

IDENTIFY THE PROBLEM

Decide the problem Mrs. C.A. has using the information from **ASK and LISTEN** and **LOOK and FEEL**

Refer to Module 7.

You decide the woman has a postpartum infection associated with complete abortion because you found expelled clots and tissue, contracted and tender uterus, foul smelling bloody purulent vaginal discharge, temperature of 102°F (39°C), BP 70/40, pulse 150 and weak. She is nervous and weak, and her hands and feet are cold and moist. She is very sick. You see that she is in shock.

TAKE APPROPRIATE ACTION

You ask someone to arrange transport right away. While you wait for transportation, what **ACTION** will you take to help Mrs. C.A.?

See Module 7.

You put her in shock position and give IV fluids right away. Keep calm. Handle her gently as body movement can make shock signs stronger (faster pulse, lower blood pressure). Reassure the woman and her family as you are giving care.

What IV solution will you give and how much will you give to Mrs. C.A.?

See **Learning Aid 1.**

Give normal saline because the woman needs fluid with sodium so that the fluid will stay in her circulation system to raise her blood pressure and slow her heart rate. The fluid will also help her temperature go down. If you do not have normal saline choose Ringers Lactate or any other fluid you may have.

Give normal saline IV fluid as fast as it will go and watch the woman very carefully for swelling around the needle. You stay beside the woman while the IV is running in fast and take her blood pressure every 15 minutes.

When her systolic blood pressure is 80 or above, and her pulse is below 140 slow the IV down to 150 ml per hour and REFER.

Mark the IV container with the hour for each 150 ml as in Figure 9. Watch the solution go in and regulate it to 150 ml per hour.

If referral is delayed, continue with the IV fluids at 150 ml per hour for 24 hours (this would be a total of 5000 ml in 24 hours if 1500 ml was given very fast in the beginning). Give oral fluids and food when the woman is able to drink and eat. Explain to the family they can also watch the amount of fluid that should be going into the vein.

Take and record the blood pressure every 30 minutes until referral is possible. Watch carefully for swelling around the needle when you are giving the IV solution. If you see swelling, check to see if the needle is in the vein. You watch this woman very carefully.

Another problem.

You are not able to get the IV started in Mrs. C.A. Her BP is now 50/30; her pulse is difficult to count; she is very weak and dehydrated. Because she is very weak, she is unable to drink. What emergency **ACTION** will you take?

See **Learning Aid 6**.

You know that Mrs. C.A. is dehydrated and must have fluids quickly to increase her blood pressure and lower her temperature. You quickly prepare 500 ml of drinking water and give it to Mrs. C.A. rectally. You know that when someone is dehydrated, absorption can take place from the colon. If you are skilled to give intraperitoneal fluids give her fluids in the peritoneal cavity.

What do you do after giving the 500 ml of water in the rectum?

See **Learning Aid 6.**

Fifteen minutes after giving the fluids, the BP is 70/34; pulse 168 but a little stronger. Mrs. C.A. is looking around and asking for water.

What do you do?

See Module 7 and Module 8.

You give an oxytocic to help the uterus remain contracted to make sure she does not start to bleed. You try again to start the IV of Normal Saline and give 500 ml as fast as it will run.

In 15 minutes her BP is 78/40 and her pulse is 150; you give another 500 ml of Normal Saline IV and also give a broad spectrum antibiotic. Mrs. C.A. is asking for something to drink, and you ask the family member to give her ORS or any other available drinking fluid.

In 15 minutes her BP is 82/50 and her pulse is 140,

What do you do on the way to the hospital?

On the way to the hospital, *y*ou continue to give Mrs. C.A. fluid to drink and keep the IV running at 150 ml per hour. You take the blood pressure and pulse, watch for bleeding, and keep the uterus contracted. You tell her and her family what is happening.

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Notes

Index

The numbers listed in this index indicate the module number. Look in the module table of contents for page numbers.

The Life-Saving Skills Manual for Midwives and its pocket-sized clinical reference book is used for day-to-day duties and as a part of a training course. It is written and reviewed by experienced midwives for use in settings around the world including health centers, clinics, and smaller hospitals with only the most basic resources. The manual was first developed in 1990 and has been used by NGO and governmental organizations in Africa, Asia, the Americas, and the Caribbean. This 4th edition has been revised and expanded with the participation of many LSS midwives, trainers and Safe Motherhood Workers from more than 10 countries. The writing is easy to translate.

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- Indonesian mother

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