

Module Ten

A Guide to Infection Control in Health Clinics

International Prototype

Developed by the International Women's Health Coalition and converted to self-instructional format by the Institute for Development Training, this manual, and others in the series, is intended as a prototype only. For effective use in training programs, a country adaptation focused on the needs of a specific type of trainee, followed by pre-testing, is considered essential. For information on sources of funding for adaptation workshops, pre-tests and multiple copies of the adapted manual contact:

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Introduction to Module Ten

This module is a simple guide for health clinic personnel to use to learn to control infection and prevent infection from being transmitted from one patient to another or to a health clinic worker. Health clinics commonly serve two functions: to treat or cure health problems and to prevent problems from occurring. Consequently, patients may include ill or injured people coming for treatment as well as healthy people coming for check-ups or immunizations. It is important that health clinics control the infection that may end up in the clinic from a sick or injured person.

This module explains in simple terms the common ways in which infection can be transmitted in the health clinic. It then describes procedures to follow to prevent the transmission of infection. Procedures described include (1) basic handwashing technique, (2) how to sterilize instruments, (3) how to sterilize linens, (4) how to prepare a sterile tray of instruments, and (5) sterile technique for administering injections. This module is intended to be a practical and useful guide for health clinic personnel to use in order to protect patients and themselves. There is a **Glossary** at the end of the module which defines major terms used throughout.

The module can be used in its present, self-instructional format for individualized training. It can also be used by trainers as background information for group training sessions and demonstrations.

The development of this module, **A Guide to Infection Control in Health Clinics**, was part of a project funded by the United States Agency for International Development.

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Instructions for the Learner

This module is self-instructional. Self-instruction is a method by which you, the learner, learn by yourself from carefully sequenced materials. The module is divided into short sections of information and each of these sections is followed by a series of questions which give you a chance to practice using the information you have learned. Answers to these questions are given so that you can check your understanding of the information.

The self-instructional method allows you to learn at your own speed and enables you to check your progress as you learn the information.

Follow the steps below in order to proceed through this self-instructional module in the most effective way:

1. Read the objectives for the module. They will outline for you what you will learn and be able to do after completing the module.
2. Take the Pre-test to get an idea of what you already know and what you need to learn.
3. Read and study the information in Section 1.
4. Answer the practice questions following the section without looking back at the information. Use a separate sheet of paper.
5. Check your answers using the answer sheet on the page following the questions.
6. If any of your answers are incorrect, reread the information in the section and try to answer the questions again.
7. When all your answers are correct, go on to the next section.
8. Proceed through the rest of the sections in the same way: read section; answer questions; check answers; reread section if necessary.
9. Take the Post-test after you have completed the entire module.
10. Check your answers to the Post-test using the answer sheet at the end of the module.

Prerequisites and Objectives

Prerequisites

You do not need to have any specific skills or background information before beginning this module. You may find it helpful, however, to review the following modules in this series:

Module Three	Gynecological Examinations
Module Four	Vaginal Infections and Sexually Transmitted Diseases
Module Six	Methods of Birth Control (Sections 5-10)

Main Learning Objective:

After completing this module, the learner will be able to describe the basic procedures that are necessary to follow to prevent the transmission of infection within the health clinic.

Sub-objectives:

The following sub-objectives are the individual skills that will enable you to perform the main objective listed above. You will learn these enabling skills in the 8 information sections that make up this module. The sub-objectives, or skills to be learned in an information section, will be listed again at the beginning of each section. After you complete the 8 information sections, you will be able to do the following:

1. define the term, "microorganism;"
2. name two examples of microorganisms that may be found in health clinics;
3. describe the five stages of the infection cycle and give an example of each;
4. list 3 common vehicles of infection transmission in the health clinic;
5. list 3 ways by which harmful microorganisms can be destroyed;
6. state the name of the process used to destroy all microorganisms;
7. list the 4 basic, minimum facilities necessary for sterilization and infection control;

8. give one example of each facility available in a local health clinic;
9. explain why handwashing is an important method for controlling infection;
10. list the seven clinic situations when handwashing is essential;
11. list the 9 steps of proper handwashing technique;
12. explain why instruments need to be sterilized;
13. identify the type of instruments and other items that need to be sterilized;
14. name 2 general methods used to sterilize or disinfect instruments;
15. list 4 ways of sterilizing instruments using extreme heat;
16. describe the 4 steps to follow for sterilizing instruments by boiling them in water;
17. describe the method for sterilizing using chemicals;
18. explain how to maintain sterile instruments;
19. state when instruments should be sterilized;
20. explain when linens need to be sterilized;
21. explain why linens need to be sterilized;
22. list the 3 steps for sterilizing linens using boiling water;
23. describe 3 ways to clean plastic and vinyl;
24. identify the 3 common vehicles of contamination that exist during the gynecological examination and the IUD insertion;
25. list the 6 steps to follow to prepare a sterile tray of instruments;
26. list the 4 preventive measures against infection to take before the gynecological examination and IUD insertion;
27. list 2 steps to follow during these procedures to prevent contamination;
28. list 4 steps to follow after the procedure to ensure that infection is not transmitted;
29. state what the primary vehicle of infection transmission in administering injections;

30. explain why sterile technique is necessary when administering injections;
31. describe the 8 steps to follow before administering an injection;
32. describe the 2 steps to follow after administering an injection to prevent transmission of infection;
33. name two methods for safe disposal of waste materials;
34. give the reason for cleaning workers to avoid raising floor dust and lint particles from linens;
35. explain why potentially infectious health personnel should be excluded from the clinic until they are well; and
36. explain why personal hygiene is important for the nurse or doctor who has direct contact with patients.

Pre-Test

To the Learner: Before starting this module, try taking the following test. This test will give you an idea of what you already know and what you will learn in this module. You will take the same test again after you have completed the module. A comparison of your two sets of answers will give you an idea of how much you have learned from this module.

1. Define the term, "microorganism."
2. Using the common cold as an example, describe the 5 stages of the Infection Cycle.
3. What are the 3 common vehicles of infection transmission in the health clinic?
4. What are 3 ways to destroy harmful microorganisms?
5. List the 4 basic, minimum facilities necessary for sterilization and infection control.
6. Why is it important to wash hands, sterilize instruments used in procedures, and sterilize contaminated linens?
7. List the 7 clinic situations when handwashing is essential if infection is to be controlled.
8. Briefly describe the 9 steps in the correct procedure for handwashing in a health clinic.
9. What are the 4 main types of extreme heat used to sterilize?
10. Describe the 4 steps in the procedure to sterilize using boiling water.
11. List the 3 steps for sterilizing linens using boiling water.
12. What are the 6 steps in the procedure to prepare a sterile tray of instruments?
13. Briefly describe the 10 steps to follow to prevent transmission of infection while administering an intramuscular injection.
14. Why should potentially infectious health personnel be excluded from the clinic until they are well?

15. Why is personal hygiene important if you have direct contact with patients in the health clinic?
16. What is the single most important procedure for reducing the transmission of potential infectious microorganisms?

1. How Infections are Transmitted

Learning Objectives:

At the end of this information section, you will be able to:

1. define the term, "microorganism;"
 2. name two examples of microorganisms that may be found in health clinics;
 3. describe the five stages of the infection cycle and give an example of each;
 4. list 2 common vehicles of infection transmission in the health clinic;
 5. list 3 ways harmful microorganisms can be destroyed; and
 6. state the name of the process used to destroy all microorganisms.
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Introduction

Here is a story that could have happened in many health clinics:

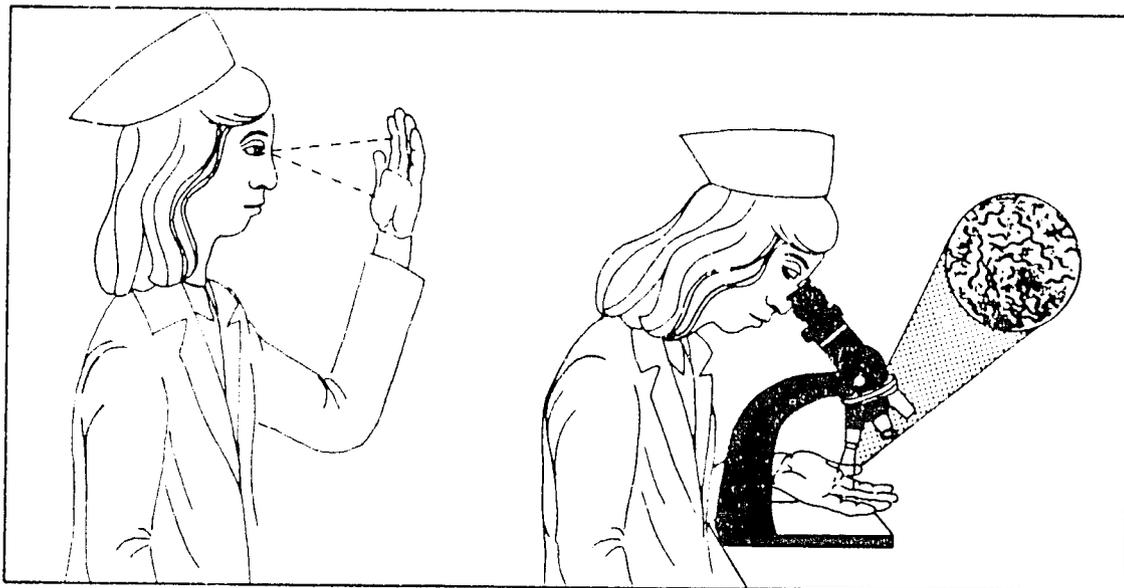
A village woman had been feeling tired and run down for some time. She noticed that she was also having a vaginal discharge that was gray. She decided to go on this day to the local health clinic for an examination. When she arrived at the clinic, she described her symptoms to the health clinician. The health clinician gave the speculum examination and took a wet prep of vaginal secretions. When the sample was examined under a microscope, it was confirmed that the woman had hemophilus vaginitis infection. The clinician gave the woman a prescription for sulfa cream to insert vaginally for two weeks.

On this same day, a woman from a nearby village went to the same health clinic to have an IUD inserted. She had two children already and wanted to wait a time before having more children. When she arrived at the clinic, the insertion procedure was explained to her. First, she was given a bi-manual examination and a speculum examination to make sure there were no problems. Then the IUD was inserted. The woman went back to her village. A few days later she developed a vaginal infection that was diagnosed as hemophilus vaginitis.

It is possible that the second village woman contracted hemophilus vaginitis at the health clinic. How was this infection transmitted to her? How can health clinic workers prevent the spread of infections within the clinic? This information section will answer these two important questions.

Microorganisms as causes of disease

Microorganisms are defined as organisms that cannot be seen by the naked eye and can be seen only through a microscope. While microorganisms are naturally present in the environment, some are harmful and some are not. Examples of microorganisms include bacteria, viruses, fungi, and protozoa.

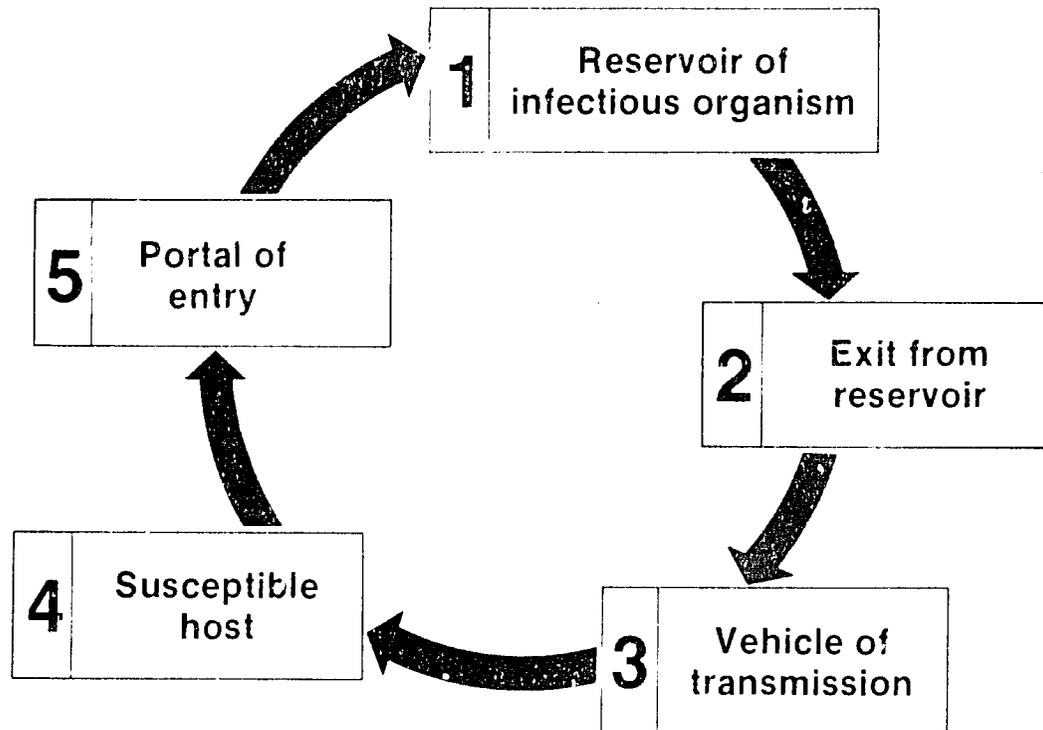


Microorganisms can only be seen under a microscope.

When microorganisms are harmful, they can cause infection and disease in the body. Often times, sick people come to the health clinic with diseases or infections caused by harmful microorganisms which can be passed to health clinic workers or to other patients visiting the clinic. A special series of events must take place for these microorganisms to be transmitted. These events make up the Infection Cycle. The infection cycle may explain how the village woman in the story contracted hemophilus vaginitis during her clinic visit to receive an IUD. Understanding how the infection cycle works will help you see why and how you as a clinic worker can take precautions to prevent this spread of infection.

The Infection Cycle

Following is a diagram of the Infection Cycle which shows how a harmful microorganism can be transmitted from one place or person to another:



The Infection Cycle

1. Reservoir of the microorganism: the natural habitat of the microorganism or the place where it collects and grows

Example: human body (cases and carriers), animals, soil

2. Exit from reservoir: the point of escape for the microorganism from the reservoir

The organisms exit from the reservoir or source of infection by discharges from the respiratory, gastro-intestinal, or genito-urinary tracts or by blood and infected tissue from a wound or break in the skin.

3. Vehicle of transmission: the means by which the microorganism is transmitted from the exit to the new entry point

Example: water, air, insects, inanimate objects, body parts such as hands

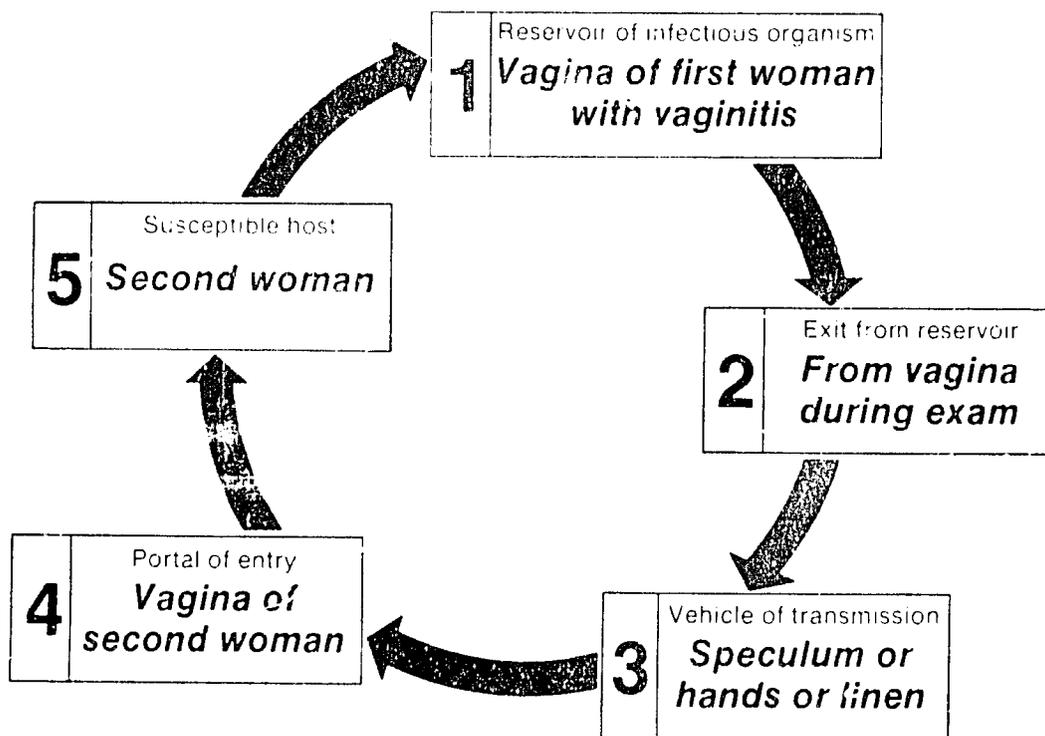
4. **Portal of entry:** the entry point which is often but not exclusively the same as the exit route

Common entry points in the body of a susceptible host are through a break in the skin or mucous membranes or through a natural body orifice, such as the urethra, the vagina, and the mouth.

5. **Susceptible host:** a new place where the microorganism can collect and grow

Example: human body, animals, soil

Here is how the Infection Cycle may have worked in the story:



The Infection Cycle: An Example

Common vehicles of infection transmission in the health clinic

Harmful microorganisms can exit the body in the form of blood, droplets in the air from coughs or sneezes, secretions and discharges, urine, and feces. In the health clinic, these can end up on instruments such as needles and speculi, on clothes and linen, and on the hands. These instruments, clothes and linens, and hands are the most common vehicles to transmit infection in a health clinic.

How to prevent the transmission of infection

Preventative measures can be taken by health clinic workers so that these harmful microorganisms are not transmitted from instruments, liners, and hands to other patients or to themselves. This can be done by destroying the microorganisms when they are on the vehicles of transmission. Three effective ways to accomplish this are (1) sterilization, (2) disinfection, and (3) antisepsis.

Sterilization kills all microorganisms, both harmful and non-harmful ones. Disinfection and antisepsis destroy most of the harmful microorganisms. Disinfection is used mostly on objects such as instruments, tables, and floors. Antisepsis is used mostly on the human body. The rest of this module will describe specific, simple procedures for the health clinic worker to use to prevent the transmission of infection within the health clinic.

Practice Questions

1. Define the term, "microorganism."
2. What are two examples of microorganisms that can be found in health clinics?
3. Using the common cold as an example, describe the 5 stages of the Infection Cycle.
4. What are 3 common vehicles of infection transmission in the health clinic?
5. What are 3 ways to destroy harmful microorganisms?
6. Which of the above methods destroys all microorganisms?

To the Learner: Turn the page to check your answers.

Answers to Practice Questions

1. Microorganisms are organisms that cannot be seen by the naked eye and can be seen only through a microscope.
2. Examples include bacteria, viruses, fungi, and protozoa.
3. The Infection Cycle:

	<u>Example:</u>
Stage 1: Reservoir of the microorganism	cold virus in respiratory system
Stage 2: Exit from the reservoir	mouth and nose through sneezing and coughing
Stage 3: Vehicle of transmission	droplets in air
Stage 4: Portal of entry	nose, mouth
Stage 5: Susceptible host	respiratory system of person inhaling virus
4. 3 common vehicles of infection transmission: (1) hands; (2) linens; and (3) instruments.
5. sterilization, disinfection, and antisepsis.
6. sterilization

To the Learner: If you missed any of the answers to the questions, go back to the information section and study it again. When all of your answers are correct, go to section 2 on the next page.

2. Facilities Necessary for Infection Control

Learning Objectives:

At the end of this information section, you will be able to:

1. list the 4 basic, minimum facilities necessary for sterilization and infection control; and
 2. give one example of each facility available in a local health clinic.
-

Introduction

For a health clinic worker to control infection in the clinic, he or she must have two things: (1) the proper training on procedures to follow, and (2) easy access to simple equipment and facilities necessary to carry out those procedures.

In Section 1, you learned that harmful microorganisms that end up on instruments, linens, and hands can be destroyed through a process called sterilization. Sterilization requires extreme heat or chemical disinfectants or a combination of the two. In order to maintain sterile conditions, the health clinic needs 4 basic, minimum items: (1) a close source of water; (2) a heat source capable of boiling water; (3) cleaning agents; and (4) containers of various sizes with lids.

None of these facilities need to be elaborate or expensive. The resourceful health clinic worker can find all of these items in most villages.

1. Water Source

Purpose: for handwashing
for cleaning equipment
for washing linens

Examples of possible sources: running water from tap in clinic
nearby well
rain collection barrels
close-by river

2. Heat Source

Purpose: to boil water to sterilize instruments
to boil water to sterilize linens

Examples of possible sources: fire
petrol gas burner
stove
autoclave

3. Cleaning Agents: Disinfectants and Antiseptics

Purpose: for handwashing
for cleaning equipment
for cleaning linen

Examples: soap : bar or liquid soap
disinfectants: detol, lysol, iodine
antiseptics : alcohol

Disinfectants are used on objects but are too strong to be used on living tissue. Antiseptics inhibit the growth of harmful organisms and can be used on humans.

4. Containers of various sizes with lids

Purpose: for storing equipment
for boiling water

Examples: large iron or aluminum pots
glass jars
metal containers
basins

Summary

If you have these four items in some form, you can control infection in your health clinic using simple procedures for handwashing, equipment sterilizing, and linen sterilizing. These procedures are described in the next three information sections.

Practice Questions

1. List the 4 basic, minimum facilities necessary for sterilization and infection control.
2. Give one example of each facility available in a local health clinic.

To the Learner: Turn the page to check your answers.

Answers to Practice Questions

1. 4 minimum facilities: (1) water source; (2) heat source; (3) cleaning agents: disinfectants and antiseptics; and (4) containers of various sizes with lids.
2. Following are some examples you may have listed:
 - water source : running water from tap, nearby well, rain collection barrels, or river
 - heat source : fire, gas burner, stove, or autoclave
 - cleaning agents : soap, detol, alcohol, iodine, lysol
 - containers with lids: large iron pots, glass jars, basins, or metal containers

To the Learner: If you missed any of the answers to the questions, go back to the information section and study it again. When all of your answers are correct, go to section 3 on the next page.

3. Basic Handwashing Technique

Learning Objectives:

At the end of this information section, you will be able to:

1. explain why handwashing is an important method for controlling infection;
 2. list the seven clinic situations when handwashing is essential; and
 3. list the 9 steps of proper handwashing technique.
-

Importance of Handwashing

Handwashing by health clinic workers is extremely important, since the hands are common vehicles of infection transmission. If you get in the habit of washing your hands after performing each clinical procedure, you will protect yourself and other patients you come in contact with from infections you may pick on your hands.

When to Handwash

There are seven clinical situations when handwashing is essential:

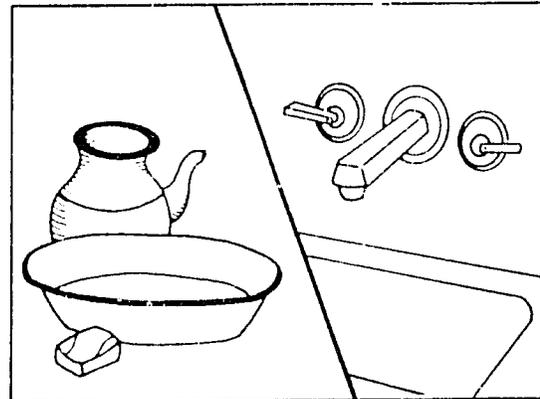
1. after prolonged and intense contact with a patient
2. before and after invasive procedures such as gynecological examinations and IUD insertions
3. before caring for susceptible patients
4. before and after contact with wounds
5. after contact with patients that are suspected of having an infection with microorganisms
6. after contact with blood, secretions, or excretions from any patient
7. between procedures for the same patient who is suspected of having an infection

In addition to handwashing, you need to protect yourself and your patients by wearing sterile rubber gloves during certain procedures such as gynecological examinations and IUD insertions.

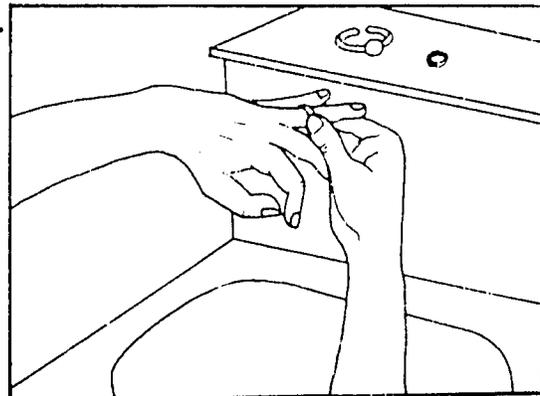
Procedure for Handwashing

General Instructions: If running water is not available in the clinic, have another worker or the patient pour clean water from a pitcher into a basin while you lather, wash, and rinse your hands. If a soap bar is used, hold it firmly during the entire wash and lather in a circular motion. If you drop the soap into the sink and pick it up, start the handwashing procedure again because the soap is contaminated by the sink. A 10-30 second scrub before and after patient care is recommended if there is minimum exposure. It takes 1-2 minutes to wash hands well and 3-4 minutes to wash if hands are heavily contaminated.

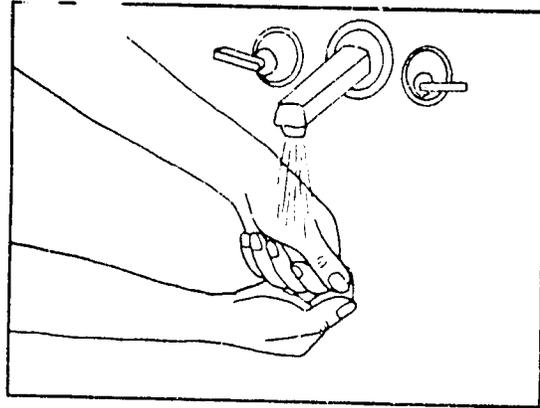
Step 1 Gather soap and towel at the wash basin. It is preferable to use liquid soap (1 teaspoon) if available.



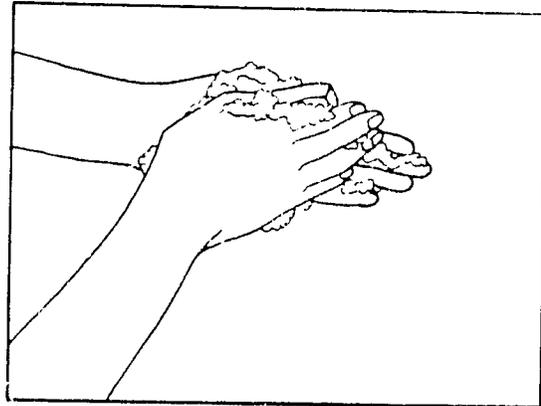
Step 2 Remove rings from fingers.



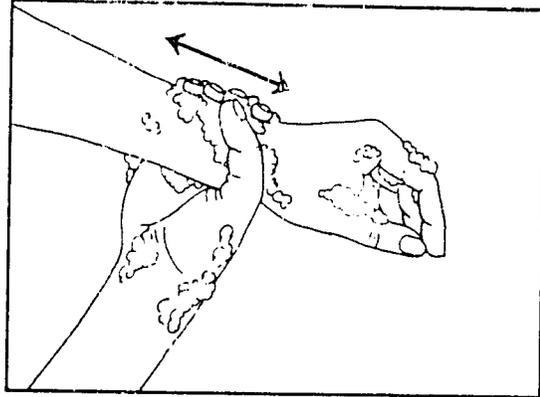
Step 3 Rinse your hands.



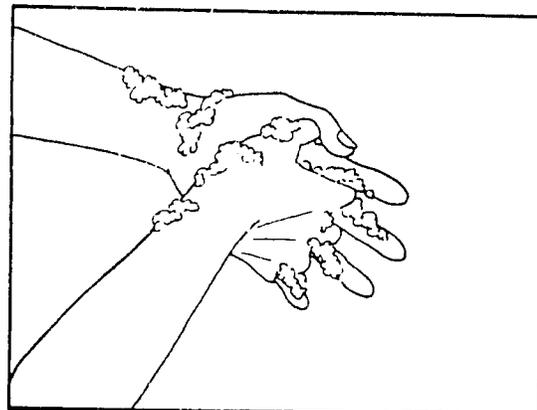
Step 4 With soap in hand, lather your hands thoroughly. Rub your hands together vigorously in a circular motion.



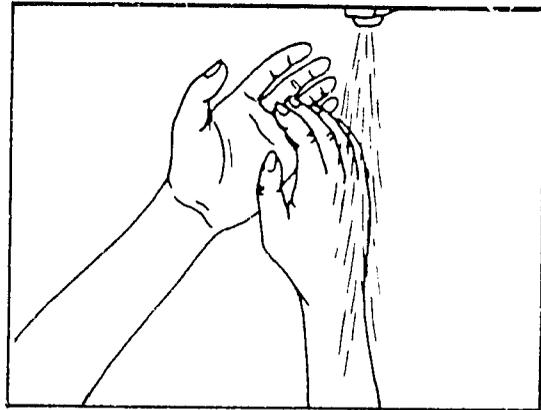
Step 5 Wash each wrist and forearm by sliding the opposite hand around.



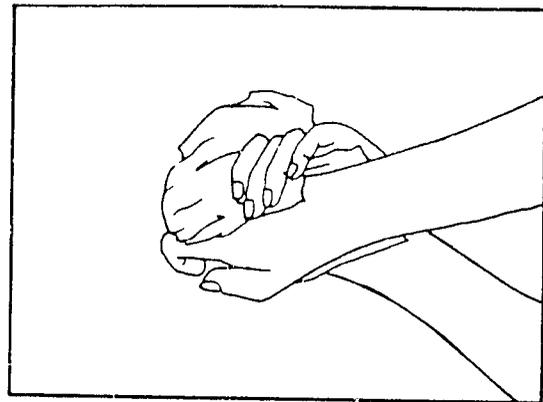
Step 6 Interlace your fingers and thumbs and slide them back and forth. Clean under nails and nail beds.



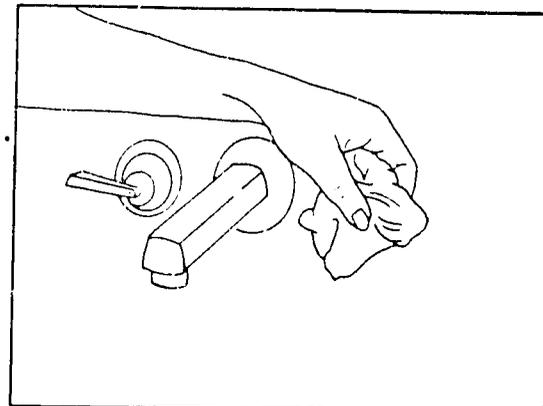
Step 7 Rinse each hand and arm from the hand down to the forearm.



Step 8 Blot your hands and forearms dry with a clean towel.



Step 9 Turn off faucet or dispose of water in basin using a towel to keep your hands from becoming contaminated.



After Handwashing

After washing hands, do not touch any unclean surface before touching the patient or clean instruments. After a procedure, repeat handwashing with the same intensity. It is this last step that protects the health worker and the next patient.

What to do if soap and water are not available

When soap and water are not easily accessible, some clinics use a hand basin with water and disinfectant such as detol. The health worker places each hand in the disinfectant water mixture. Rubber gloves can be sterilized in this way as well.

Summary

Frequent handwashing is the single most important procedure for reducing the transmission of potentially infectious microorganisms. Handwashing by the health clinician before and after a procedure is extremely important.

Practice Questions

1. Why is handwashing an important method for controlling infection in the health clinic?
2. List the 7 clinic situations when handwashing is essential if infection is to be controlled.
3. There are 9 steps in the correct procedure for handwashing in a clinic. Briefly describe each step.

To the Learner: Turn the page to check your answers.

Answers to Practice Questions

1. Hands are common vehicles of infection transmission. Handwashing can prevent the spread of infection from bacteria or other microorganisms that may have gotten on the hands during a clinic procedure.
2. 7 clinic situations requiring handwashing:
 - 1) after prolonged and intense contact with a patient
 - 2) before and after invasive procedures such as gynecological examinations and IUD insertions
 - 3) before caring for susceptible patients
 - 4) before and after contact with wounds
 - 5) after contact with patients that are suspected of having an infection from microorganisms.
 - 6) after contact with blood, secretions, or excretions from any patient
 - 7) between procedures for the same patient who is suspected of having an infection.
3. 9 steps in the handwashing procedure:
 - 1) Gather soap and towel at wash basin.
 - 2) Remove rings from fingers.
 - 3) Rinse hands.
 - 4) With soap in hand, lather hands thoroughly. Rub hands together vigorously in a circular motion.
 - 5) Wash each wrist and forearm by sliding the opposite hand around.
 - 6) Interlace fingers and thumbs and slide them back and forth. Clean under nails.
 - 7) Rinse each hand and arm from the forearm down.
 - 8) Blot hands and forearms dry with a clean towel.
 - 9) Turn off faucet or dispose of water using a towel so your hands won't become contaminated.

To the Learner: If you missed any of the answers to the questions, go back to the information section and study it again. When all of your answers are correct, go to section 4 on the next page.

4. How to Sterilize Instruments

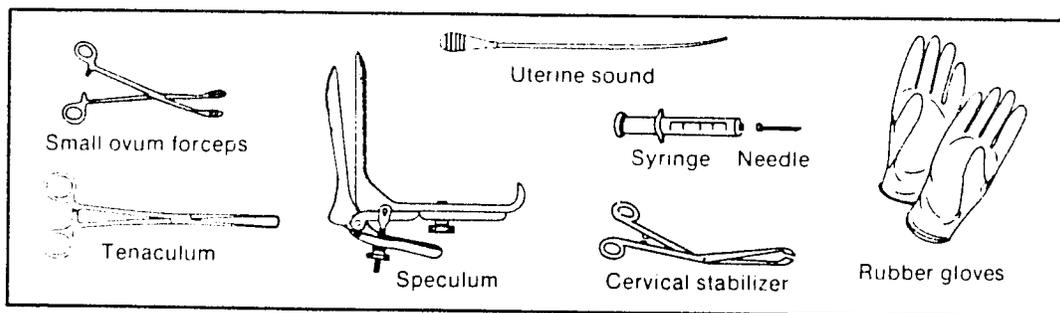
Learning Objectives:

At the end of this information section, you will be able to:

1. explain why instruments need to be sterilized;
 2. identify the type of instruments that need to be sterilized;
 3. name 2 general methods used to sterilize or disinfect instruments;
 4. list 4 ways of sterilizing instruments using extreme heat;
 5. describe the 4 steps to follow for sterilizing instruments by boiling them in water;
 6. describe the method for sterilizing using chemicals;
 7. explain how to maintain sterile instruments; and
 8. state when instruments should be sterilized.
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Introduction

Instruments used in examinations and clinic procedures need to be sterile because they can be vehicles of infection transmission. Instruments that need to be sterilized include those that are used in invasive procedures. Examples are needles and glass syringes, forceps, scissors, the speculum, the cervical probe, and other metal instruments. Non-metal items such as rubber gloves and IUD's that are not prepackaged also need to be sterilized before used in procedures. There are two general methods a clinic can use to ensure that materials and instruments are free from harmful microorganisms: (1) physical methods using heat, and (2) chemical methods.



Examples of Instruments that Need to be Sterilized

How to sterilize instruments using heat

Following are four ways of using extreme heat to kill harmful microorganisms:

1. Steam under pressure

Very hot steam builds up inside the autoclave or the pressure cooker when they are closed tightly. To sterilize instruments in this way, place the instruments in the pressure cooker (on the rack above the water) or autoclave. Bring to 121°C-123°C under 15 to 17 pounds of pressure in 15 to 45 minutes. Remove instruments with sterile forceps when you are ready to use them.

2. Dry heat

The dry heat of a baking oven can sterilize. Place instruments to be sterilized on a metal tray or pan inside the oven. Bake at 165°C for 2 hours. A longer time is needed if a lower temperature is used. Remove tray and instruments. The tray will be sterile as well and will be a good place to leave the instruments until they are ready to be used.

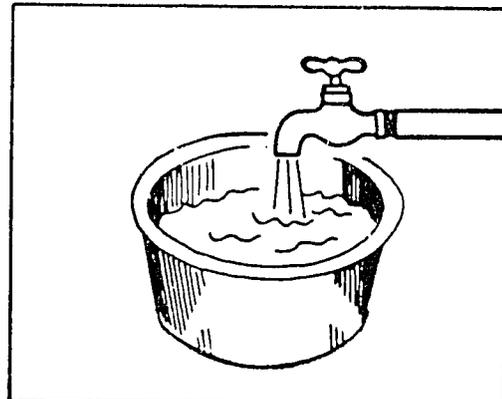
3. Radiant heat

Radiant heat such as ultraviolet light and sunlight can be used to sterilize. This is an inexpensive method you may want to use to sterilize linens and cloth materials, but sterilization by ultraviolet rays requires at least 6 to 8 hours.

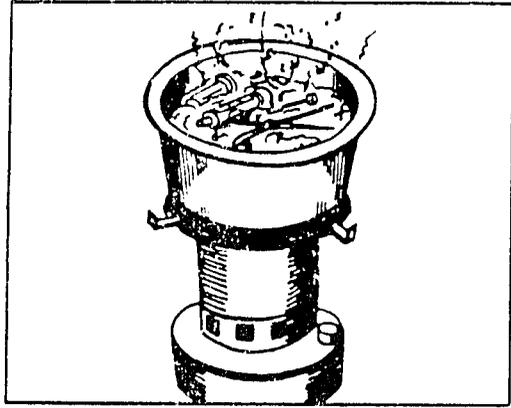
4. Boiling water

Boiling a pan of water on a stove or a fire is probably the most simple and least expensive way of sterilizing instruments. Boiling water will kill nearly all microorganisms except spores. Here are the steps to follow:

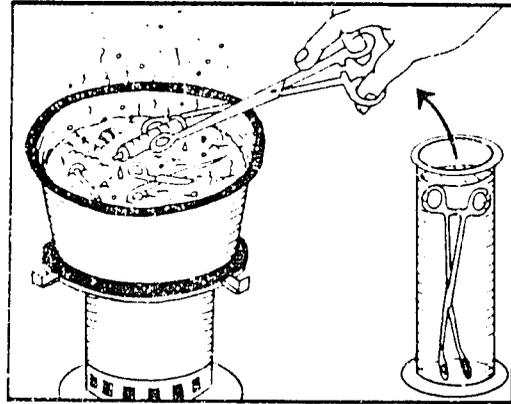
Step 1 Fill a metal pan or basin with water.



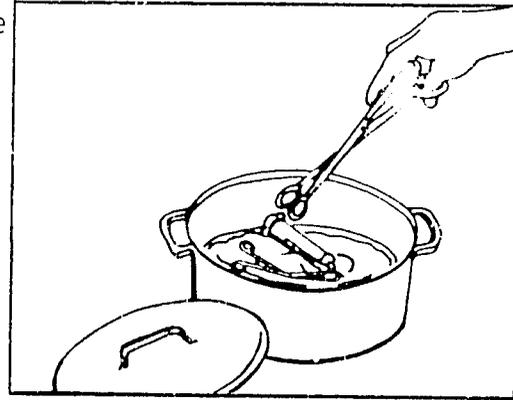
Step 2 Place pan of water on stove or fire. Put instruments in pan. Bring water to a boil (100°C) and let boil for a minimum of 15 minutes.



Step 3 Remove instruments with sterile forceps.



Step 4 Put instruments on a sterile tray or in a sterile container with a lid until you are ready to use them.



How to sterilize instruments using chemicals

Certain chemicals can be used to kill harmful microorganisms on both objects and on the body. There are two categories of these chemicals: antiseptics and disinfectants. Disinfectants are used mostly for instruments and antiseptics are used mostly for diminishing bacteria on the body.

Disinfectants such as detol and antiseptics such as alcohol and iodine can be used to sterilize instruments and other materials such as rubber gloves.

To sterilize metal instruments

Soak instruments in a solution of boiled water and a disinfectant such as detol or lysol. The solution loses its strength after two hours of use, so be sure to throw out the solution and prepare a new solution after two hours of use.

To sterilize IUD's and plastic devices

Occasionally the IUD comes in a sterile plastic package. More often they come in gross supply and need to be placed in a disinfecting solution before insertion. Soak the IUD for 10 to 15 minutes in a solution made from 10 cc (about 2 teaspoons) of iodine and 500 cc of boiled water. Devices should not be left in iodine solution overnight as they may lose their flexibility and become rigid.

Maintaining sterile instruments

Once you have sterilized instruments, you need to keep them from being contaminated before they are used. This can be done by placing the sterilized instruments in a metal tray or basin which has been sterilized and then cover the container with a lid which has also been sterilized. Instruments can also be put in glass or metal jars containing alcohol. Remember to use sterile gloves or sterile forceps to transfer the instruments from the heat source to the container where they will be stored.

When to sterilize instruments

All instruments that are used in invasive procedures should be sterilized before and after the procedure. Invasive procedures are those in which the instrument touches the inside of the patient's body. Examples of invasive procedures include gynecological examinations, IUD insertions, and injections.

Practice Questions

1. Why do instruments need to be sterilized?
2. What type of instruments need to be sterilized? Give 2 examples of these instruments.
3. There are two general methods that can be used to sterilize or disinfect instruments. What are these methods?
4. What are the 4 main types of extreme heat used to sterilize?
5. Describe the 4 steps in the procedure to sterilize using boiling water.
6. How can chemicals be used to destroy harmful bacteria?
7. Once you have sterilized instruments, how can you make sure these instruments remain sterile until you are ready to use them?
8. When do instruments need to be sterilized?

To the Learner: Turn the page to check your answers.

Answers to Practice Questions

1. Instruments used in examinations and clinic procedures need to be sterile because they can be vehicles of infection transmission. Sterilization destroys any harmful microorganisms that may have gotten on the instruments.
2. Instruments that need to be sterilized include those that are used in invasive procedures. Examples include needles and glass syringes, speculum, cervical probe, non-packaged IUD, and rubber gloves.
3. physical methods using heat and chemical methods
4. 4 types of extreme heat: (1) steam under pressure; (2) dry heat; (3) radiant heat; and (4) boiling water.
5. 4 steps to sterilizing using boiling water:
 - 1) Fill a metal pan or basin with water.
 - 2) Place pan on stove or fire. Put instruments in pan and let boil for a minimum of 15 minutes.
 - 3) Remove instruments with sterile forceps.
 - 4) Put instruments in sterile container with a lid or on a sterile tray until you are ready to use them.
6. Most plastic and metal instruments can be sterilized by soaking them in solutions of chemical disinfectants or in a solution of antiseptics and boiled, clean water.
7. Once instruments are sterilized, they should be put in a sterile container, with a lid or on a tray with a sterile towel. Sterile forceps should be used to move the instruments to these containers.
8. All instruments that are used in invasive procedures should be sterilized before and after the procedure.

To the Learner: If you missed any of the answers to the questions, go back to the information section and study it again. When all of your answers are correct, go to section 5 on the next page.

5. How to Sterilize Linens

Learning Objectives:

At the end of this information section, you will be able to:

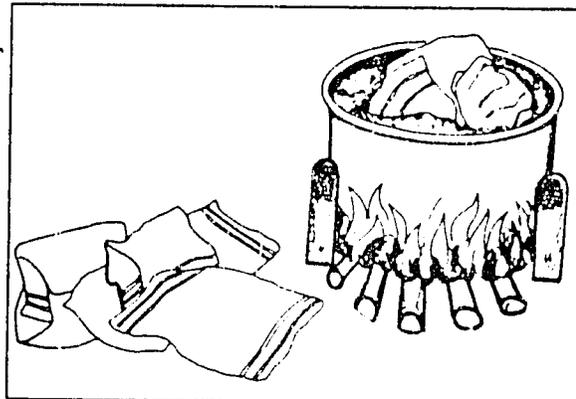
1. explain when linens need to be sterilized;
 2. explain why linens need to be sterilized;
 3. list the 3 steps for sterilizing linens using boiling water; and
 4. describe 3 ways to clean plastic and vinyl.
-

Introduction

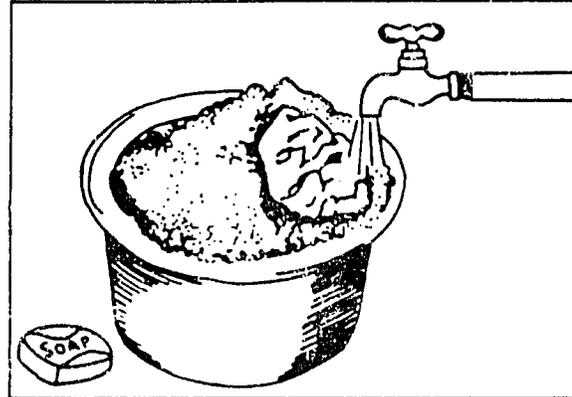
Linens, such as gown, sheets, table covers and towels, should be fresh and unsoiled. Laundry facilities will vary from a central place for washing and distribution to the more common isolated health clinic where local resources must be used. Linens that have been soiled by infectious discharge such as blood, vaginal discharge, urine or feces, should be sterilized by boiling in water when possible. If not, the linens can be spread on the ground in the hot sun for several hours before washing. Be sure to carry the linen in such a way that you avoid touching the sections that have been soiled by infectious discharges. These areas can transmit infection to you or other clinic workers.

Procedure for Sterilizing Linens Using Boiling Water

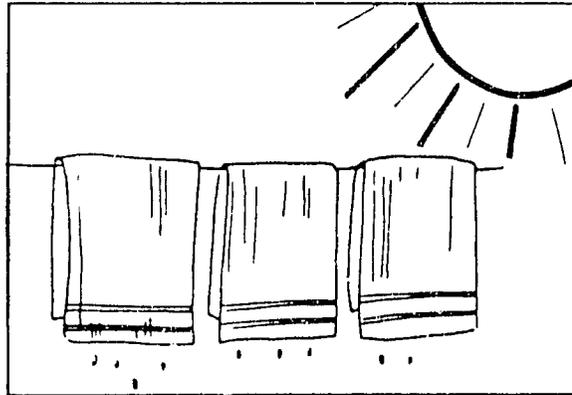
- Step 1 Place linens in a large pot of boiling water for at least 20 minutes.



Step 2 Carefully remove the linen and wash with soap and water.



Step 3 Hang linen in direct sunlight to dry.



After linens are sterilized, washed and dried in the sun, store them in a place that will protect them from exposure to dust and other elements until you are ready to use them.

Cleaning plastic and vinyl

Some clinics have been able to obtain pieces of plastic sheeting or soft vinyl which can be cut in squares and used in appropriate places such as on the examining table. These squares can be cleaned by (1) washing with soap and water, (2) wiping with a disinfectant, or (3) exposing them to the direct sunlight for at least 2 hours.

Summary

The last 3 information sections have explained how to clean and sterilize the three main transmitters of infection in a health clinic: hands, instruments, and linens. The next 2 information sections will explain how to apply this information to common clinic procedures such as gynecological examinations, IUD insertions, and injections.

Practice Questions

1. When do linens need to be sterilized?
2. Why do linens need to be sterilized?
3. List the 3 steps for sterilizing linens using boiling water.
4. What are 3 ways to clean plastic and vinyl?

To the Learner: Turn the page to check your answers.

Answers to Practice Questions

1. Linens need to be sterilized if they have been soiled by infectious discharges such as blood, vaginal discharge, urine or feces.
2. Linens with infectious discharges on them can be vehicles of infection transmission. Sterilizing linens destroys the harmful microorganisms and prevents the spread of infection to others.
3. 3 step procedure for sterilizing linens using boiling water:
 - 1) Place linens in a large pot of boiling water for at least 20 minutes.
 - 2) Carefully remove the linen and wash with soap and water.
 - 3) Hang linen in direct sunlight to dry.
4. 3 ways to clean plastic and vinyl:
 - wash with soap and water
 - wipe with a disinfectant
 - expose to direct sunlight for at least 2 hours

To the Learner: If you missed any of the answers to the questions, go back to the information section and study it again. When all of your answers are correct, go to section 6 on the next page.

6. Infection Control During Gynecological Examinations and IUD Insertions

Learning Objectives:

At the end of this information section, you will be able to:

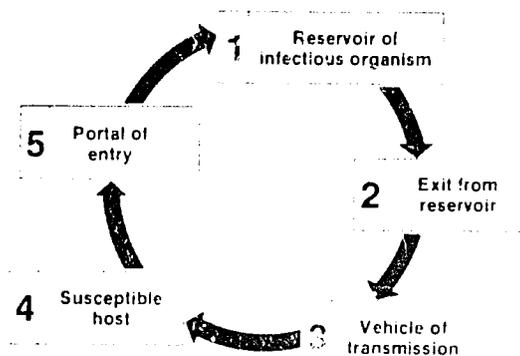
1. identify the 3 common vehicles of contamination that exist during the gynecological examination and the IUD insertion;
 2. list the 6 steps to follow to prepare a sterile tray of instruments;
 3. list the 4 preventive measures against infection to take before the gynecological examination and IUD insertion;
 4. list 2 steps to follow during these procedures to prevent contamination; and
 5. list 4 steps to follow after the procedure to ensure that infection is not transmitted.
-

Introduction

The purpose of this information section is to identify the common vehicles of contamination that exist during the gynecological examination and IUD insertion and to explain how to prevent contamination from occurring by applying the procedures on how to clean and sterilize hands, instruments, and linens. It is not the purpose of this section to describe the specific procedures of the gynecological examination or IUD insertion. These procedures are described in detail in Module Three, "Gynecological Examinations," and in Module Six, "Methods of Birth Control."

The Infection Cycle in the Gynecological Examination

In section one, you learned that harmful microorganisms can be transmitted from one place or person to another. Following is a review diagram of that process. It is called the Infection Cycle.

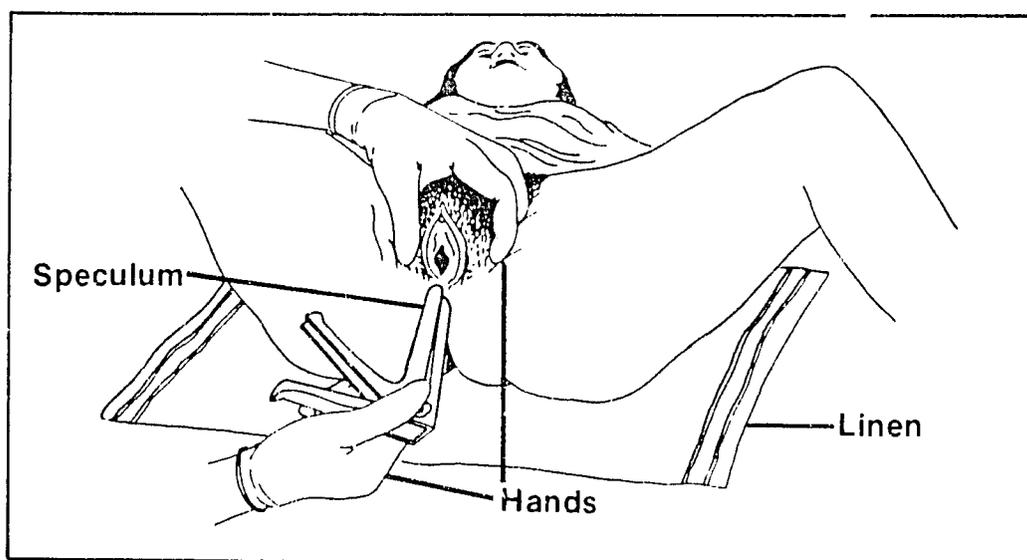


The Infection Cycle

The pelvic area of any female patient is a possible reservoir of microorganisms that could cause disease. Organisms are normally present in the pelvic area. They may or may not cause symptoms in the patient, depending on her degree of immunity to her own organisms. If she is immune to them, they will not cause disease. However, these same organisms can cause disease in others if they are transmitted to a susceptible host. The second host might be the clinician or the next patient. Therefore, it is extremely important that protective measures be taken throughout the procedure. The clinician also must be aware that infection in the pelvic area may come from the bladder and exit through the urinary meatus, or in the rectum and exit through the anus.

Vehicles of Transmission

There are three common vehicles of transmission during the gynecological examination and IUD insertion. They are (1) the hands of the examiner; (2) the instruments used; and (3) the linens used on the examining table and during the procedure.

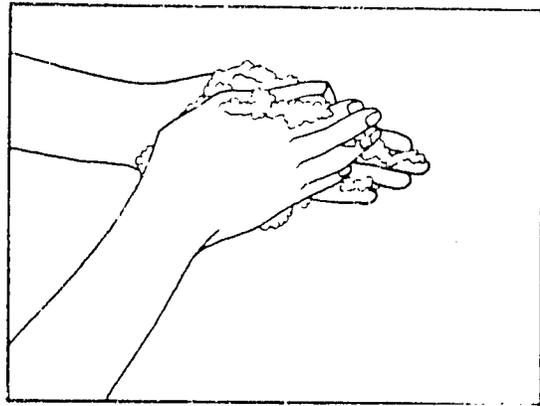


Points of Transmission of Infection During Pelvic Exam

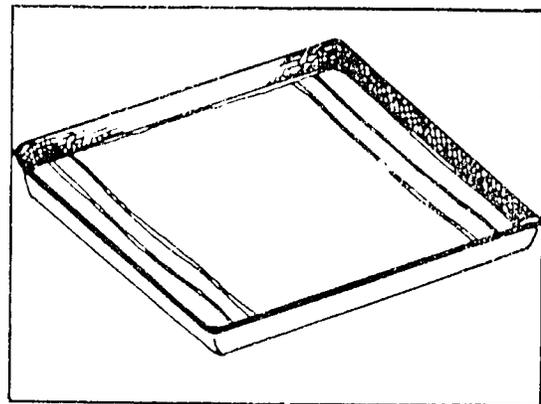
Preparing a Sterile Tray of Instruments

For both the gynecological examinations and the IUD insertion, the clinician will need a sterile tray of instruments to be prepared before the examination. The following seven steps explain how to prepare the sterile tray:

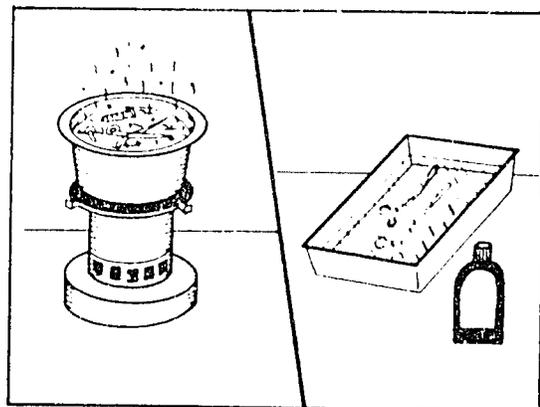
Step 1 Wash hands thoroughly.



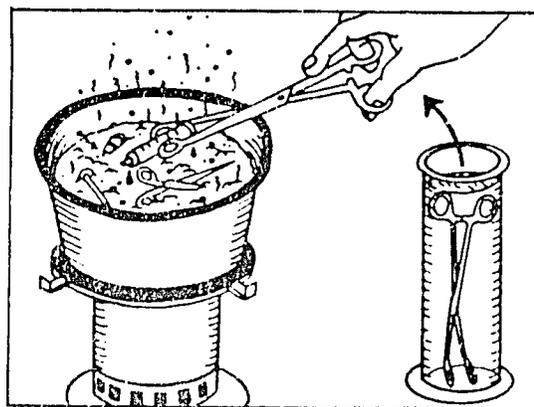
Step 2 Place sterile linen or towel on a clean tray.



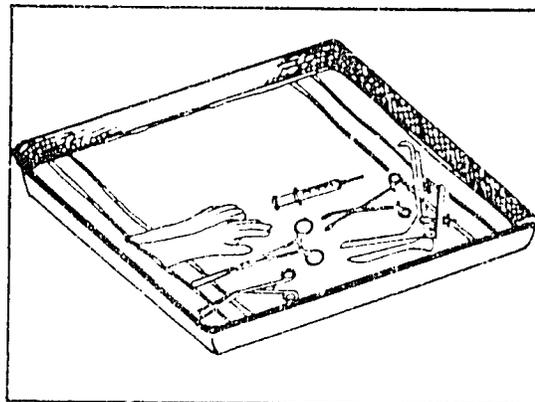
Step 3 Sterilize instruments by boiling or soaking in a disinfectant.



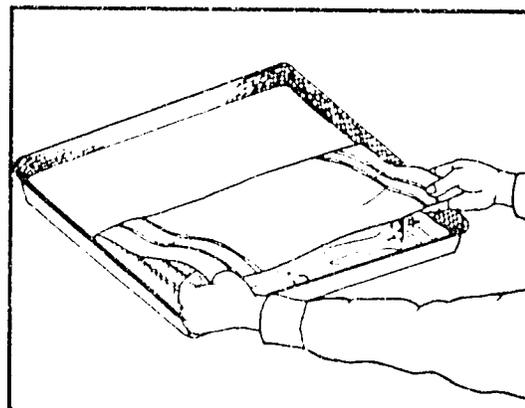
Step 4 Remove sterile forceps from container filled with antiseptic. Then remove instruments with sterile forceps.



Step 5 Place on sterile towel or linen.



Step 6 Fold towel down and place by examining table.



Sterile Procedures during Gynecological Examinations

The following list outlines the steps to follow before, during, and after the gynecological examination and the IUD insertion to prevent the transmission of infection.

Before the Procedure

1. Prepare a sterile tray of instruments.
(For IUD insertion, leave pre-packaged IUD in plastic wrapper. Sterilize non-packaged IUD in a solution of iodine and boiled water.)
2. Make sure linen on examining table is clean.
3. Wash hands thoroughly.
4. Put on sterile gloves.

During the Procedure

1. Clean the cervix of the patient with some kind of antiseptic.
2. Place used instruments, such as speculum, in an area away from sterile tray.

After the Procedure

1. Wash and boil all instruments.
2. Wash linen if soiled and boil if contaminated.
3. Dispose of all used cotton, gauze or other materials carefully.
4. Wash hands thoroughly.

Summary

It is important for the health clinic worker to know how to clean and sterilize the hands, the instruments used, and the linen because these are common vehicles which can transmit infection to another person. It is equally important for the health clinic worker to know when to apply these skills and to apply them consistently as part of the clinic routine. The gynecological examinations and the IUD insertions are two procedures in Family Planning clinics which require consistent application of these skills. Administering injections such as Depo-Provera is another procedure requiring sterile technique. This procedure is described in the next information section.

Practice Questions

1. What are the 3 common vehicles of contamination that exist during the gynecological examination and the IUD insertion?
2. List briefly the 6 steps in the procedure to prepare a sterile tray of instruments.
3. What are the 4 preventative measures against infection to take before the gynecological examination and IUD insertion?
4. What are the 2 preventative measures to take during these procedures?
5. What are the 4 steps to follow after the procedure to ensure that the infection is not transmitted?

To the Learner: Turn the page to check your answers.

Answers to Practice Questions

1. 3 common vehicles of contamination during the gynecological examination: (1) the hands of the examiner; (2) the instruments used; and (3) the linens used on the examining table.
2. 6 steps in procedure to prepare a sterile tray of instruments:
 - 1) Wash hands thoroughly.
 - 2) Place sterile linen on towel or clean tray.
 - 3) Sterilizing instruments by boiling or soaking in a disinfectant.
 - 4) Remove sterile forceps from container filled with antiseptic. Then remove instruments with sterile forceps.
 - 5) Place on sterile towel or linen.
 - 6) Fold towel down and place by examining table.
3. Before the procedure: (1) Prepare a sterile tray of instruments. (2) Make sure linen on examining table is clean. (3) Wash hands thoroughly. (4) Put on sterile gloves.
4. During the procedure: (1) Clean the cervix of the patient with antiseptic. (2) Place used instruments, such as speculum, in an area away from sterile tray.
5. After the procedure: (1) Wash and boil all instruments. (2) Wash linen if soiled and boil if contaminated. (3) Dispose of all used cotton, gauze or other materials carefully. (4) Wash hands thoroughly.

To the Learner: If you missed any of the answers to the questions, go back to the information section and study it again. When all of your answers are correct, go to section 7 on the next page.

7 Infection Control While Administering Injections

Learning Objectives:

At the end of this information section, you will be able to:

1. explain why sterile technique is necessary when administering injections;
 2. state the primary vehicle of infection transmission in administering injections;
 3. describe the 8 steps to follow before administering an injection; and
 4. describe the 2 steps to follow after administering an injection to prevent transmission of infection.
-

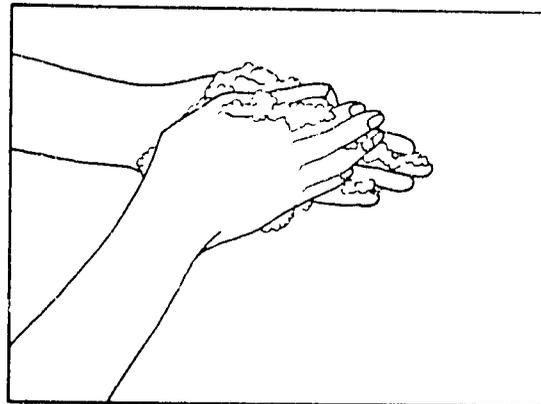
Introduction

An injection is an invasive medical procedure because the needle actually penetrates the patient's body. Therefore, sterile technique must be applied throughout the procedure to prevent the patient from receiving infection during the injection. The needle itself is the primary vehicle of transmission. This information section will describe the procedure to follow (to prevent infection) before and after giving an intramuscular injection. It is not the purpose of this information to describe the specific skill of how to administer an injection but rather how to use sterile technique within the procedure.

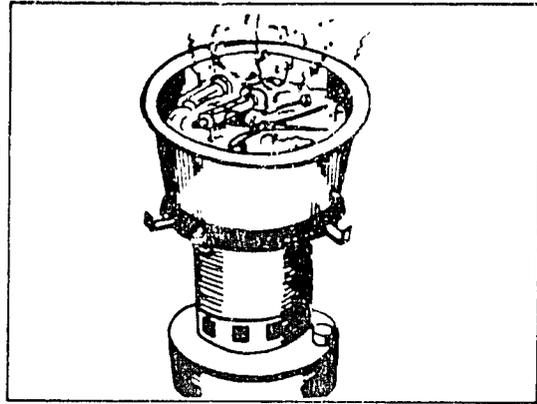
Sterile Procedure for Administering Injections

Before the Injection

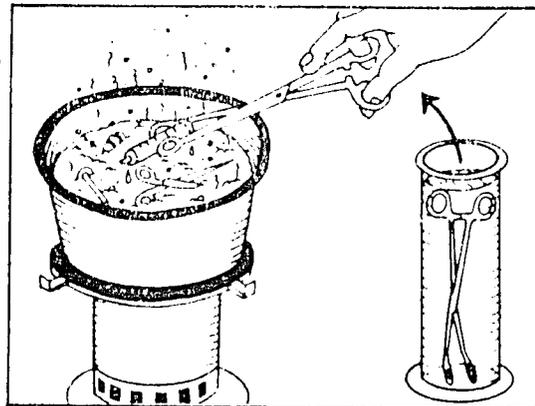
Step 1 Wash hands thoroughly.



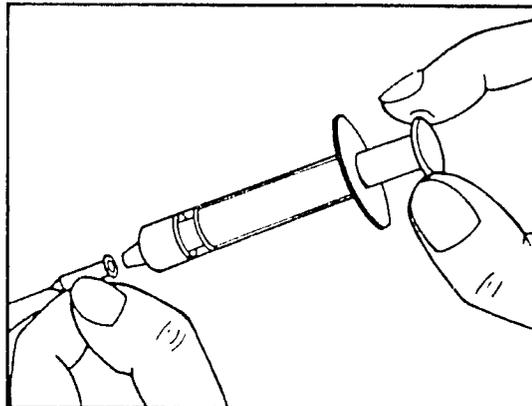
Step 2 If using a glass syringe take needle and syringe apart and boil for a minimum of 15 minutes. (You may use a prepackaged sterile plastic syringe. These should be used only once and disposed of).



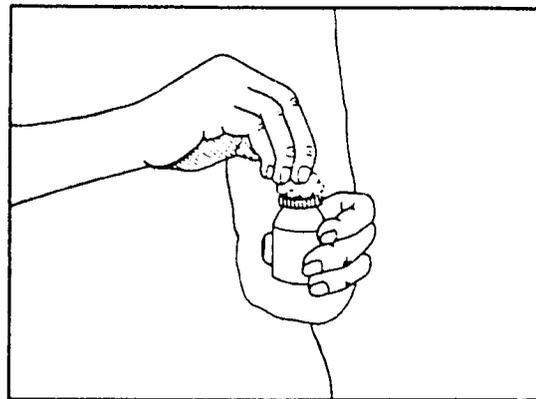
Step 3 After boiling for 15 minutes, remove the needle and glass syringe with sterile forceps.



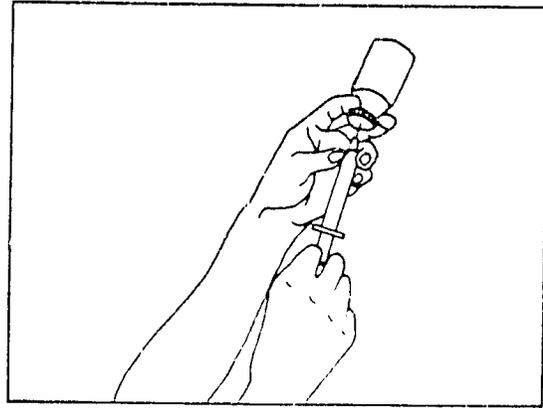
Step 4 Put the needle and syringe together touching only the base of the needle and the button on the plunger.



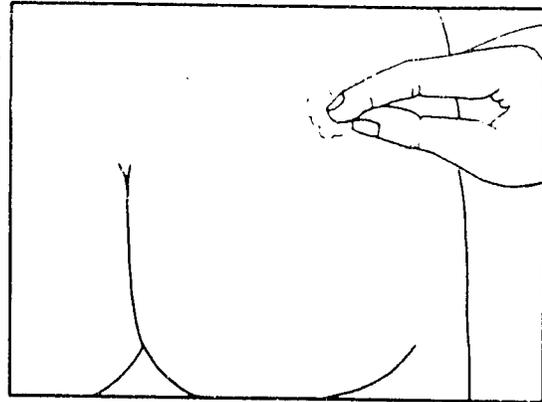
Step 5 Clean the bottle top of medicine with cotton and alcohol.



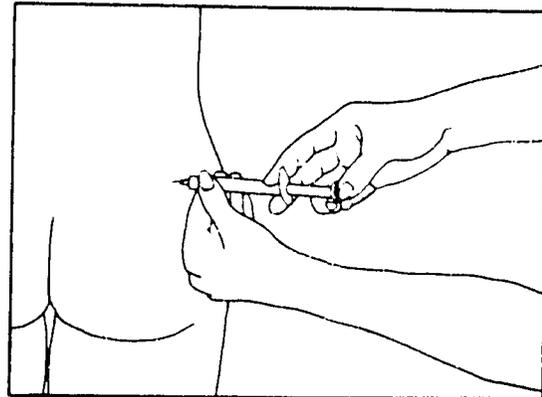
Step 6 Fill the syringe with medicine (If medicine is in powder form and must be mixed with water, make sure the water has been boiled for at least 15 minutes to sterilize it.)



Step 7 Clean the site of the injection on the patient's body with alcohol.

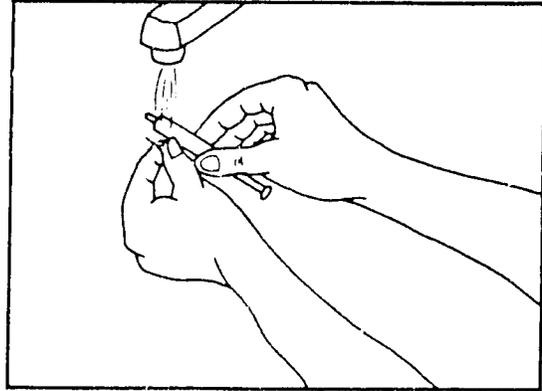


Step 8 Administer the intramuscular injection according to proper procedures.

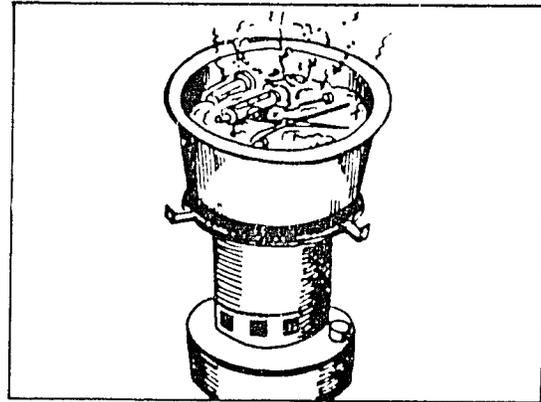


After the Injection

Step 1 Rinse the needle and glass syringe at once.



Step 2 Sterilize the needle and glass syringe by boiling before using it again. (Remember! If you are using a disposable, plastic syringe, dispose of it and do not use it again.)



This same basic sterile procedure can be applied to subcutaneous and intravenous injections as well as to intramuscular injections.

Practice Questions

1. Why is sterile technique necessary when administering injections?
2. What is the primary vehicle of infection transmission when you are giving an injection?
3. Briefly describe the 8 steps to follow before administering an injection to prevent transmission of infection.
4. Briefly describe the 2 steps to follow after administering an intramuscular injection to prevent transmission of infection.

To the Learner: Turn the page to check your answers.

Answers to Practice Questions

1. It is necessary to use sterile technique when administering injections because an injection is an invasive medical procedure. The needle penetrates the patient's body.
2. The needle is the primary vehicle of infection transmission.
3. 8 steps before the procedure:
 - 1) Wash hands thoroughly.
 - 2) Take needle and syringe apart and boil for a minimum of 15 minutes.
 - 3) Remove the already boiled needle and glass syringe with sterile forceps.
 - 4) Put the needle and syringe together touching only the base of the needle and the button of the plunger.
 - 5) Clean the bottle top of medicine with cotton and alcohol.
 - 6) Fill the syringe with medicine.
 - 7) Clean the site of the injection on the patient's body with alcohol.
 - 8) Administer the intramuscular injection according to proper procedures.
4. 2 steps after the injection:
 - 1) Rinse the needle and glass syringe at once.
 - 2) Sterilize the needle and glass syringe by boiling before using again.

To the Learner: If you missed any of the answers to the questions, go back to the information section and study it again. When all of your answers are correct, go to section 8 on the next page.

8. General Precautions for Infection Control

Learning Objectives:

At the end of this information section, you will be able to:

1. name two methods for safe disposal of waste materials;
 2. give the reason for cleaning workers to avoid raising floor dust and lint particles from linens;
 3. explain why potentially infectious health personnel should be excluded from the clinic until they are well; and
 4. explain why personal hygiene is important for the nurse or doctor who has direct contact with patients.
-

Introduction

The preceding 7 information sections of this learning module have described how infection is transmitted and how this transmission of infection can be prevented during common procedures performed in the health clinic. The purpose of the last information section is to describe four additional precautions the health clinic as a whole can take to prevent the spread of infection within the clinic.

1. Disposal of Waste Materials

Each day or so, a health clinic will accumulate a certain amount of waste materials including used cotton, gauze, sponges, paper, and some disposable products such as surgical gloves and syringes if available. The disposal of wastes from the clinic should be done with great care because they may be contaminated with infectious microorganisms. Careful disposal can be achieved by having a lid covered container in each examining room where contaminated materials can be placed. At the end of each clinic session, this material must be removed. Many rural clinics take this waste at least 20 to 30 feet from the clinic and burn it. Where this is not possible, the waste should be buried and covered with earth.

Precautions for health clinic personnel: Any worker handling the contaminated waste should avoid contact with the waste as much as possible. After transferring or disposing of the waste, the worker should wash his/her hands very thoroughly with soap and water.

2. Cleaning the Clinic

There are several small practices for housekeepers in health clinic to follow that will help control infection. Besides washing and sterilizing the linen and disposing of contaminated wastes properly, the housekeeper should take special care when cleaning the floors. Use a dampened cloth to avoid raising dust, and avoid shaking the linens. Dust and lint particles constitute a vehicle for transmitting infections.

3. Exclusion of Potentially Infectious Health Personnel

There is no place in any health setting for sick personnel. This is especially true for those who have colds, flu, bronchitis, tuberculosis, or infection of any skin surface. In MCH and family planning clinics, personnel with any of the symptoms accompanying these illnesses will be in very close contact with patients. Personnel with cuts on their fingers may not only pick up infections, but if already infected, may pass it on to others. The situation is an especially difficult one to handle when there are limited personnel, busy clinics, or an epidemic of a contagious disease in the locality. However, those in administrative positions must face up to the harm that can be done. When no substitute person can be found to take on clinic responsibilities, the clinic may have to be closed temporarily. This action has to be weighed against the danger of the clinic being a source for an outbreak of new disease entity or adding an additional infection to a person already ill.

There is also a problem with "carriers" of disease. Carriers are persons shedding microorganisms without having symptoms. Streptococcus, staphylococcus, and typhoid are common microorganisms that are "carried" by health clinicians. Health clinicians should be screened out by periodic laboratory tests to make sure they are not carriers of infectious diseases.

4. Personal Hygiene of Health Clinic Personnel

There are several simple habits for health clinic personnel to practice which will prevent them from contracting an infection and possibly transmitting it to another patient or person. First, health clinic personnel who have direct contact with patients should take extra care to make sure their clothes, hands, and hair are cleaned regularly. Second, personnel (as well as patients) should avoid coughing, sneezing or breathing directly on others. A tissue or handkerchief should be used to cover the nose and mouth whenever possible. Finally, it is very important that all personnel wash

their hands after using the toilet. These three simple practices will contribute to maintaining the health clinic as a healthy place.

SUMMARY: Training Health Clinic Personnel to Control Infection

Every member of the health clinic staff - including the housekeeper, the nurse, the doctor - should be aware of what they can do on a routine basis to control infection in the clinic. Once they learn the simple procedures presented in this module, it is important that these procedures be accepted as a necessary and critical part of day to day practice in the clinic.

Many times workers will be willing to change their attitudes and work habits if they understand the reason and importance for a procedure. Along with teaching the specific steps of performing clean and sterile procedures, it will be important to teach the health clinic workers that they are not only protecting other patients from infection but also themselves when they follow these procedures on a regular basis.

Practice Questions

1. What are 2 methods for safe disposal of waste materials?
2. Why should clinic workers avoid raising floor dust and lint particles from linens?
3. Why should potentially infectious health personnel be excluded from the clinic until they are well?
4. Why is personal hygiene important if you have direct contact with patients in the health clinic?

To the Learner: Turn the page to check your answers.

Answers to Practice Questions

1. 2 methods for safe disposal of waste materials:
 - 1) burn waste at least 20-30 feet from clinic
 - 2) bury the waste
2. Dust and lint particles can be vehicles for transmitting infections that may be on the floor or on the linen.
3. Potentially infectious health personnel can pass on infection to patients and others in the health clinic.
4. Personal hygiene such as clean clothes, clean hair, and clean hands will prevent the health clinic personnel from contracting an infection and possibly transmitting it to another patient.

To the Learner: If you missed any answers to the questions, go back to the information section and study it again. When all of your answers are correct, you have finished the information sections of this learning module. Briefly study the sections again. Then take the Post-test on the next page.

Post-Test

To the Learner: This test will tell you how much you have learned from this self-instructional module. After taking the test, check your answers on the page following the test. Be sure to use a separate sheet of paper for recording your answers.

1. Define the term, "microorganism."
2. Using the common cold as an example, describe the 5 stages of the Infection Cycle.
3. What are the 3 common vehicles of infection transmission in the health clinic?
4. What are 3 ways to destroy harmful microorganisms?
5. List the 4 basic, minimum facilities necessary for sterilization and infection control.
6. Why is it important to wash hands, sterilize instruments used in procedures, and sterilize contaminated linens?
7. List the 7 clinic situations when handwashing is essential if infection is to be controlled.
8. Briefly describe the 9 steps in the correct procedure for handwashing in a health clinic.
9. What are the 4 main types of extreme heat used to sterilize?
10. Describe the 4 steps in the procedure to sterilize using boiling water.
11. List the 3 steps for sterilizing linens using boiling water.
12. What are the 6 steps in the procedure to prepare a sterile tray of instruments?
13. Briefly describe the 10 steps to follow to prevent transmission of infection while administering an intramuscular injection.
14. Why should potentially infectious health personnel be excluded from the clinic until they are well?

15. Why is personal hygiene important if you have direct contact with patients in the health clinic?
16. What is the single most important procedure for reducing the transmission of potential infectious microorganisms?

Answers to Test

1. Microorganisms are organisms that cannot be seen by the naked eye and can be seen only through a microscope.
2. The Infection Cycle:

Stage 1: Reservoir of the microorganism	<u>Example:</u> cold virus in respiratory system
Stage 2: Exit from the reservoir	mouth and nose through sneezing and coughing
Stage 3: Vehicle of transmission	droplets in air
Stage 4: Portal of entry	nose, mouth
Stage 5: Susceptible host	respiratory system of person inhaling virus
3. 3 common vehicles of infection transmission: (1) hands; (2) linens; and (3) instruments.
4. sterilization, disinfection, and antisepsis.
5. 4 minimum facilities: (1) water source; (2) heat source; (3) cleaning agents: disinfectants and antiseptics; and (4) containers of various sizes with lids.
6. Hands, instruments used in procedures and contaminated linens should be sterilized because they are the 3 most common vehicles of infection transmission in the health clinic.
7. 7 clinic situations requiring handwashing:
 - 1) after prolonged and intense contact with a patient
 - 2) before and after invasive procedures such as gynecological examinations and IUD insertions
 - 3) before caring for susceptible patients
 - 4) before and after contact with wounds
 - 5) after contact with patients that are suspected of having an infection from microorganisms.
 - 6) after contact with blood, secretions, or excretions from any patient
 - 7) between procedures for the same patient who is suspected of having an infection.

8. 9 steps in the handwashing procedure:
 - 1) Gather soap and towel at wash basin.
 - 2) Remove rings from fingers.
 - 3) Rinse hands.
 - 4) With soap in hand, lather hands thoroughly. Rub hands together vigorously in a circular motion.
 - 5) Wash each wrist and forearm by sliding the opposite hand around.
 - 6) Interlace fingers and thumbs and slide them back and forth. Clean under nails.
 - 7) Rinse each hand and arm from the forearm down.
 - 8) Blot hands and forearms dry with a clean towel.
 - 9) Turn off faucet or dispose of water using a towel so your hands won't become contaminated.

9. 4 types of extreme heat: (1) steam under pressure; (2) dry heat; (3) radiant heat; and (4) boiling water.

10. 4 steps to sterilizing using boiling water:
 - 1) Fill a metal pan or basin with water.
 - 2) Place pan on stove or fire. Put instruments in pan and let boil for a minimum of 15 minutes.
 - 3) Remove instruments with sterile forceps.
 - 4) Put instruments in sterile container with a lid or on a sterile tray until you are ready to use them.

11. 3 step procedure for sterilizing linens using boiling water:
 - 1) Place linens in a large pot of boiling water for at least 20 minutes.
 - 2) Carefully remove the linen and wash with soap and water.
 - 3) Hang linen in direct sunlight to dry.

12. 6 steps in procedure to prepare a sterile tray of instruments:
 - 1) Wash hands thoroughly.
 - 2) Place sterile linen on towel or clean tray.
 - 3) Sterilizing instruments by boiling or soaking in a disinfectant.
 - 4) Remove sterile forceps from container filled with antiseptic. Then remove instruments with sterile forceps.
 - 5) Place on sterile towel or linen.
 - 6) Fold towel down and place by examining table.

13. 10 steps to follow to prevent infection while administering an injection:
 - 1) Wash hands thoroughly.
 - 2) Take needle and syringe apart and boil for a minimum of 15 minutes.
 - 3) Remove the already boiled needle and glass syringe with sterile forceps.
 - 4) Put the needle and syringe together touching only the base of the needle and the button of the plunger.
 - 5) Clean the bottle top of medicine with cotton and alcohol.
 - 6) Fill the syringe with medicine.
 - 7) Clean the site of the injection on the patient's body with alcohol.
 - 8) Administer the intramuscular injection according to proper procedures.
 - 9) Rinse the needle and glass syringe at once.
 - 10) Sterilize the needle and glass syringe by boiling before using again.
14. Potentially infectious health personnel can pass on infection to patients and others in the health clinic.
15. Personal hygiene such as clean clothes, clean hair, and clean hands will prevent the health clinic personnel from contracting an infection and possibly transmitting it to another patient.
16. handwashing

Glossary

antiseptis: a method of destroying microorganisms to prevent infection.

antiseptic: a substance used mostly on the human body that tends to inhibit the growth and reproduction of microorganisms.

bacteria: microscopic organisms.

carrier of disease: a person or animal who harbors and spreads an organism causing disease in others but who does not become ill.

contagious disease: a disease that can be transmitted from one person to another by direct or indirect contact.

contaminate: to soil or infect something that is clean.

Depo-Prevera: a contraceptive which is administered to women by intramuscular injection.

disinfectant: a substance used to kill bacteria and other microorganisms. It is usually too strong to be used on the human body.

excretion: the process of eliminating or getting rid of substances by body organs or tissues.

forceps: a surgical instrument which has two handles each attached to a blade like scissors. They are used to grasp, handle, compress, pull or join tissue, equipment, or supplies.

fungi: simple parasitic plants which can cause infections on humans.

gynecological examination: a procedure in which the woman's external and internal reproductive organs are examined.

immunity: the ability of the body to resist infectious disease.

infection: a disease caused by the invasion of the body by harmful microorganisms.

Infection Cycle: the cycle in which a harmful microorganism is transmitted from one place or person to another. There are five elements in the cycle: (1) reservoir of the microorganism; (2) exit from the reservoir; (3) vehicle of transmission; (4) portal of entry. and (5) susceptible host.

injection: the act of forcing a liquid into the body by means of a needle and a syringe.

intramuscular injection: the introduction of a needle into a muscle to administer an injection.

invasive procedure: a procedure in which the health clinician uses hands or instruments which penetrate the patient's body like inserting the speculum or administering an injection.

IUD: abbreviation for intrauterine device. A contraceptive device that is inserted and left in the uterine cavity to prevent pregnancy.

microorganism: a tiny entity capable of carrying on living processes such as reproduction. A microorganism can only be seen when magnified under a microscope.

microscope: an instrument which enlarges objects so they can be examined better.

protozoa: a one-celled microorganism.

secretion: fluid discharged from a gland or organ of the body.

speculum: an instrument which widens the opening of the body cavities, such as the vagina, for examination.

staphylococcus: a kind of bacteria which can cause serious infections.

sterile technique: a procedure which ensures that there will be no bacteria introduced into an examination or operation. The procedure involves special handwashing and sterilization of equipment to be used.

sterilization: a technique for destroying microorganisms using heat, water, chemicals, or gases.

streptococcus: a microorganism that may cause infections.

syringe: a device for withdrawing, injecting, or instilling fluids. It usually consists of a glass or plastic cylindrical barrel having a close-fitting plunger at one end and a small opening at the other end to which a hollow-bore needle is attached.

vehicles of infection: the means by which a harmful microorganism is transmitted from the exit point to a new entry point.

viruses: microorganisms which can cause infections such as the common cold, measles, smallpox and poliomyelitis.