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Protect the patient from infection

An important responsibility of the nurse is to prevent the spread of infection in hospitals. Many people in hospital carry infections. Patients can be infected by these germs (microorganisms). They are carried by staff who have not properly washed their hands or whose uniforms are contaminated, by dust or droplets of air carrying infection, by visitors with disease, by other patients with disease, or by equipment or materials that are not sterile. Because they are already sick or have recently had surgery, patients can become infected very easily. Preventing the spread of infections is extremely important in hospitals.



Prevent infection

The easiest way to prevent the spread of infection is to destroy the germs when they are on hands, equipment and furniture, such as patient beds. Effective ways to destroy germs include:

- Antisepsis - destroys or stops the growth of germs.
- Decontamination - makes objects safer to handle before cleaning.
- Cleaning - removes dirt and germs from skin and objects, using soap and water.
- High-level disinfection - destroys most germs on objects.

- Sterilization - destroys all germs on objects, such as surgical instruments.

Additional methods to prevent infection include:

- Protective clothing
- Safe disposal of bodily wastes and infected articles, such as dressings.

To prevent the spread of infection in hospitals, nurses and other health care providers follow the practices of medical and surgical asepsis.

Clean technique (medical asepsis) reduces the number of germs present and prevents them from being passed on to patients.

Surgical technique (surgical asepsis) involves keeping objects and areas free of germs to make sure that procedures are sterile.



Clean technique

For clean technique, follow these guidelines:

- Clean wounds outward from the wound site. Change soiled dressings or bandages and properly dispose of them. Use normal saline to wash wounds that are clean. Use Betadine and Chlorhexidine to clean the skin. Use a soap and water wash for dirty wounds.
- Prevent the spread of microorganisms in droplets. Encourage patients to cover their mouth with tissue or a handkerchief when coughing or sneezing.
- Never have patients share personal items. Keep the bedside clean and dry. It should not have water and open bottles of solution on it.
- Clean and disinfect soiled reusable objects.

- Do not let soiled linens and other articles touch your uniform. Dispose of them appropriately.
- Empty suction and drainage bottles before they become full.
- Do not raise dust by shaking linens.
- Never put supplies or equipment on the floor.
- Wear clean disposable gloves, if available, when handling body fluids. Wash your hands after taking off the gloves.
- Wear a protective gown or apron, if available, whenever you are carrying out a "dirty" procedure.
- When a patient area is dirty, first clean the area that is the least soiled. Clean the most soiled area last.
- Pour liquids into the sink close to the drain so that they do not splash.
- Put used disposable needles and syringes and other "sharps" in puncture-resistant containers for disposal.
- Wash your hands frequently.
 - ◆ Wash hands before and after eating, preparing food or feeding.
 - ◆ Wash hands after using the toilet.
 - ◆ Wash hands after blowing your nose, coughing or sneezing into your hands.
 - ◆ Wash hands before and after special nursing procedures.
 - ◆ Wash hands before and after contact with wounds.

**Wash your hands
before and after
contact
with a patient.**

- ◆ Wash hands after handling soiled linens and waste.
- ◆ Wash hands before and after wearing gloves.
- ◆ Wash hands after contact with a patient.
- ◆ Wash hands after handling contaminated dressings or equipment such as a bedpan.



Hand-washing technique

Thorough hand washing is the most effective way to prevent the spread of infection in hospitals. These principles are important for effective hand washing:



- Always remove jewellery before washing hands.
- Use soap and running water, if available.
- Wet your hands and wrists, keeping hands lower than the elbows. This allows water to flow to your fingertips and avoids contaminating your arms.
- Lather thoroughly. Use firm rubbing and circular motions for 30 seconds to wash the palms, back of the hands, fingers, between the fingers, knuckles, wrists and forearms.
- If your hands are visibly soiled, scrub them for one to four minutes.
- Clean under your fingernails.
- If you use bar soap, after washing, rinse the soap with water.

- If there is running water, rinse your hands thoroughly. Use a pitcher if there is no running water. Do not dip your hands into a bowl to rinse. This will recontaminate them.

Avoid repeatedly dipping your hands into a basin of water, even when an antiseptic has been added.

- Dry your hands carefully with a clean dry towel or air dry them.
- Use a corner of the clean towel to turn off the water if the tap (faucet) is hand operated, not operated by foot or elbow.

It is the nurse's responsibility to try to make sure that every patient has a container for water, soap and a clean towel. When no running water is available, use one of the following:

Clinical alert:
Wash your hands frequently even if running water is not available.

- a bucket with a tap which can be turned on and off
- a bucket and pitcher

If you use a bucket of fresh water, always empty it and fill it again with fresh water for the next person to use.



Care of equipment

Cleaning is also necessary for objects used in patient care.

Before washing used surgical instruments, re-usable needles and syringes, and gloves, they should be decontaminated.

0.5% chlorine bleach solution is best to use for decontamination because it quickly kills the HIV/AIDS and hepatitis B virus. However, 0.5% chlorine bleach solution quickly loses its power to kill germs. Prepare a fresh solution every day. Change it as soon as it looks dirty. It is also good for cleaning blood spills. If you do not have chlorine bleach, alcohol or a phenolic solution may be used.

When you are washing soiled objects, first rinse them with cold water to get off organic material such as mucus and blood. Then wash the article in hot soapy water. Use a brush to clean grooves and corners that are hard to get at. Finally, rinse off the soap and dry them.

To disinfect objects, use a chemical preparation (disinfectant) such as phenol or iodine compounds. Disinfection with sodium and calcium hypochlorite, for example, destroys existing germs on objects but will not kill spores, viruses or fungi. Antiseptics are less concentrated than disinfectants. Antiseptics are used for hands or other skin areas. They include iodine, alcohol, Chlorhexidine, and Betadine.

Sterilization, or the destruction of all microorganisms, can be done by steam (autoclave or pressure cooker), or boiling water. Boiling in water is the most practical and inexpensive way of sterilization. Dry heat does not sterilize. It will disinfect or destroy existing germs on objects.



Sterile technique

Sterile techniques (surgical asepsis) are used in the operating room and the delivery room. You should also use sterile techniques at the patient's bedside for invasive procedures:

- inserting an intravenous needle
- suctioning the patient's airway
- inserting a urinary catheter

- changing wound dressings.

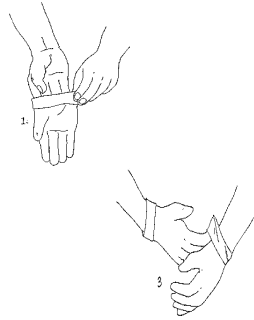
***Clinical alert:* Always use sterile techniques when doing a procedure that could introduce infection into the patient's body. Protect the patient as well as possible against infection.**

Surgical technique needs a work area with no microorganisms (a sterile field). This area contains sterile items for surgery or other invasive procedures.

A sterile field is usually a sterile drape or a thick layer of waxed paper or the opened package in which sterile items were packed. The sterile field is put on a clean, cold, smooth, dry working surface such as a cart. (A cart used for aseptic techniques should not be used for other purposes.) Sterile techniques are used to stop germs going into the body and to prevent the spread of infection. These are the basic principles of sterile technique:

- Wash your hands thoroughly. Rub your hands with a bactericidal solution such as Chlorhexidine, if available.
- Keep your hands higher than your elbows while washing. This stops any contaminants on your forearm from reaching your hands.

- Put on sterile gloves if doing procedures at the bedside. In the operating room, also put on a sterile gown and a surgical cap, and wear a mask.
- Sterile objects become unsterile if they are touched by an unsterile object, or if they are out of vision, or below the waist of the nurse.



Putting on sterile gloves

Any object that becomes unsterile must be resterilized before it is used.

- Moving air can carry microorganisms. Keep doors closed and traffic to a minimum where a sterile procedure is being performed.
- Make sure that windows are screened or closed and strict rodent control is maintained in the operating theatre/suite.
- Do not sneeze or cough over a sterile field. Talk as little as possible.

Clinical alert: If there is any question about sterility, assume the object is unsterile.

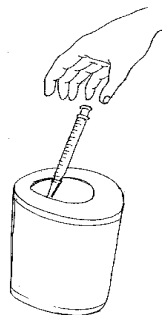


Universal precautions

Universal precautions are recommended for blood and for all body fluids, and excretions. They are to prevent the spread of blood-borne pathogens. These include hepatitis B virus, hepatitis C virus, and human immunodeficiency virus (HIV).

Follow the universal precautions with all patients.

- The most important universal precaution is hand-washing. Immediately wash your hands and any other skin surfaces that are contaminated with blood, body fluids containing blood, or other potentially infectious body fluids.
- Be extremely careful with sharp objects. Use one hand to recap a clean needle. Place the cap on a flat surface and slide the needle in. Do not recap needles which will be disposed of. Do not remove used needles from disposable syringes by hand. Do not bend, break or otherwise move used needles by hand.
- To prevent needlestick injuries, put used disposable syringes and needles, scalpel blades and other sharp items in puncture-resistant containers for disposal immediately after use. Keep these containers as close as possible to where sharp objects will be used.
- Take care to avoid injuries when using needles, scalpels and other sharp instruments, cleaning used instruments and disposing of used needles and sharps.
- When possible, protect yourself when you are exposed to blood and other fluids that could infect you. Wear gloves when you are in contact with blood or other body fluids containing blood. Change your gloves after patient contact. Wear gowns in situations where it is likely that droplets of blood or body fluids will be sprayed. Wear a mask and goggles when droplets of blood or other body fluids may spray onto your eyes, nose or mouth. Use a mouthpiece or resuscitation bag when providing resuscitation.



**Throw away sharp objects
in puncture-resistant
containers**

- Handle soiled linen as little as possible. Put linen which is soiled with blood or body fluids in leak-resistant bags. Put all specimens of blood and body fluids in containers with secure lids. Get rid of infective waste following hospital policy.
- Use a disinfectant to decontaminate work surfaces when there is a spill of blood or other body fluids. If there is not very much disinfectant, do not dilute the solutions, because that makes them ineffective.
- Do not care for a patient when you have open skin lesions. If you must do so, wear gloves.



Gloves

Wear latex gloves if you are likely to touch blood or body fluids. If there are not many gloves, keep them for when they are most needed, for example, when you expect a lot of contact with blood. If you are going to re-use gloves, look at them carefully and get rid of damaged ones. To examine them for damage, gently blow the gloves full of air, twist the cuff and hold them under clean water. You could also fill them with clean water and squeeze them to see if they leak. Wash off any blood and body fluids from gloves which are undamaged. Use water, but not soap, and disinfect them. Finally, sterilize the gloves. Good quality latex gloves can be boiled or bleached five or more times. Dry the gloves away from direct sunlight.



Isolation technique

You may sometimes need to isolate a patient to prevent the spread of infection. This can happen when a patient has a disease which is easily caught by others (a highly contagious or highly virulent disease) or an infection that is resistant to standard antibiotics. The aim of isolation is to protect other patients in the hospital, visitors and staff, while also giving the right care to the infected patient.

Ideally, put the contagious person in a separate room with the door closed. Anyone entering the room should wear a gown, mask and gloves, if available. Maintain a strict control of visitors. Put a sign on the door to inform anyone entering that this person is in isolation.

Do not avoid the patient who is in isolation. Give the patient who has a contagious disease the same kind, respectful treatment that is given to other patients.

If a patient is to be isolated, prepare the room by getting rid of all unnecessary furniture. The patient should also have as few things as possible in the room. All these things should be washable. Store everything the patient will need in the room to prevent unnecessary coming and going.

Dishes used by the patient must be washed separately. The patient should have a separate toilet or separate bedpan and urinal. Wash these separately.

Put contaminated articles from the patient's room in a plastic-lined container or bag. Label this as infectious. Keep a sharps container in the room. Dispose of urine, faeces, and vomit at once. Mop up any spilled fluids immediately and clean the area with disinfectant. Make sure that cleaning staff understand the restrictions. Use separate cleaning equipment for this room. When in the room, cleaning staff should wear gloves if available.

After any contact with the patient, remove your gloves and wash your hands with antiseptic solution or soap and water.

Patient education

Carefully explain to the patient and family why restrictions are necessary. Make sure that the person does not feel emotionally isolated or viewed as somehow bad. The patient and family are much more likely to cooperate with the restrictions if they understand them but do not feel accused. Let them ask questions and discuss their fears.

Patients who need strict isolation can develop problems. They can feel stigmatized. They are alone all the time and do not have any

stimulation. Be alert for the problems that may come up, such as high anxiety and confusion, resulting from too little stimulation. Try to talk with the patient regularly. Bring the patient a radio or reading materials. Above all, be courteous and accepting. Do not convey any feelings of disgust or fear about the infection.



How to care for the patient with a contagious disease

Patients with tuberculosis

Patients with pulmonary tuberculosis (TB) should be put in private rooms or a separate ward. If a separate ward is not available, keep them in a part of the ward away from other patients. A suspected TB patient should not be put in a TB ward until you know that he or she definitely has the disease. Patients who are HIV positive should never be in contact with TB patients since they are especially vulnerable to TB infection.

TB patient rooms should be well ventilated. The doors should be closed to the hall and the windows open to the outside. This will reduce the chance of airborne infection. If possible, patient rooms should have large uncurtained windows to let in sunlight.

Do not dry sweep the room or shake out soiled bedding and clothing indoors. The infection may be spread through particles on dust from bedding, dressings, floors, etc. Soiled bedding and clothes should be washed immediately.

A face mask reduces the risk of infecting others. TB patients and those suspected of having TB should wear a mask when moving from one part of the hospital to another and during procedures. The patient could use a clean handkerchief or a cloth tied over the nose and mouth. This will protect other patients and the nurses. It is not helpful for the nurse to wear a mask unless she is doing a procedure that induces a cough. Visiting family members should not wear masks.

Hand-washing after contact with the patient is absolutely essential.

The best way to prevent the spread of TB is by rapid diagnosis and treatment of infectious cases. All patients with tuberculosis should be on short-course chemotherapy for the disease. Infectious patients usually become non-infectious within about two to four weeks, and symptoms improve. The risk to others stops.

An infant should be separated from an infectious mother for two to four weeks; after that she will not be contagious. If the mother is taking the medicine, she can still breast-feed. During the time when she is separated from the infant, she should hand express the breast milk to ensure that she will have breast milk after the two to four weeks.

It is essential that patients take every single dose of the drug prescribed. Teach patients and the family that TB is curable as long as the patient takes regularly the whole course of medicine prescribed. The course of treatment usually lasts six to nine months. To ensure that patients take their medications regularly, direct supervision by a health worker is required for at least the first two months of treatment.

Explain to patients that if they stop taking the drug, they risk developing drug-resistant TB. They will also become infectious again, putting others at risk. Show patients how to reduce the risk of infecting others, by covering their mouth with their hand when coughing and using a sputum pot with a lid. Tell the patient and family to avoid spitting. Above all, be kind to the patients and do not avoid them because of the disease.

Leprosy patients

Few leprosy patients are hospitalized. Treatment is generally on an outpatient basis. Within one week of beginning the standard multiple drug therapy, leprosy patients are not contagious. It is important to understand this if you have leprosy patients in your hospital. No precautions need to be taken to protect other patients or staff. There is also no risk for the baby of a mother with leprosy. Children who receive the BCG vaccine for tuberculosis are also protected against leprosy.

When you care for patients with leprosy, do not make the patients feel that they are bad because they have the disease, as was done in the past. This is important. You can help the patient to understand the importance of taking the medicines regularly and completely to be cured. For patients at risk of nerve damage, teach simple protection. For example, the person should wear shoes to protect insensitive feet, use gloves when working with hot or sharp objects, and use goggles to protect his or her eyes against dust.

Teach the patient to soak his or her hands and apply Vaseline regularly to prevent cracks. If the person has stiff joints, teach him or her to do range of motion exercises. If there are cracks on the patient's feet, he or she should also soak the feet and apply Vaseline.

Patients with Human Immunodeficiency Virus (HIV) and Acquired Immune Deficiency Syndrome (AIDS)

The human immunodeficiency virus (HIV), which is the virus that causes acquired immune deficiency syndrome or AIDS, can be transmitted through:

- unprotected vaginal or anal intercourse
- any unprotected contact with blood, semen, or vaginal fluids
- blood transfusions or blood products obtained from donors
- from mother to infant during pregnancy or labour or through breast-feeding.

The AIDS virus is extremely dangerous, but it is also very fragile and dies quickly. It cannot be spread by any casual contact or by coughing, sneezing or touching, by sharing dishes or cups or by food or water. The most common way of spreading the infection is through sexual intercourse.

A person infected with the virus may have no symptoms of disease for years but can infect others.

Most people with HIV will eventually develop acquired immune-deficiency syndrome or AIDS. Symptoms include:

- very reduced immunity to other diseases
- unexplained persistent night sweats
- fatigue
- weight loss
- enlarged lymph glands
- persistent diarrhoea
- skin rashes or bluish-purple skin lesions
- thick grey-white coating on the tongue, mucous membranes or throat
- chronic cough and recurrent lung or other body infections.
- opportunistic infections: these are infections from microorganisms that are commonly found in the body but do not cause problems if the immune system is functioning properly.

Care of the patient with AIDS requires universal precautions, just as for patients with other blood-borne pathogens. The risk of infection of health care workers is extremely low if the universal precautions listed earlier in this chapter are followed. Since AIDS is fatal, these precautions are essential.

Blood is the most likely route for the virus to be passed on (transmitted) in hospitals. This happens through a needlestick injury or through injury with another sharp instrument contaminated with the blood of the infected person. The virus is not passed on through

unbroken skin. It can be passed on if open sores are exposed to infected blood or other body fluids. It can also be passed on through splashes of infected blood onto mucous membranes.

To prevent transmission of the virus, be especially careful with disposable needles and other sharp instruments. Use them only once and put them into a sharps container immediately after use. Then burn or bury them. Wear thick gloves to clean any reusable sharp instruments, then disinfect or sterilize them.

Many people are living longer with the disease today. It is important to teach AIDS patients and their families to take care of the patient at home and avoid problems. Good nutrition and enough rest and sleep are especially important. Also, the patient should stay as active as possible. Exercise is good. However, patients should avoid unnecessary exposure to other infections.

Tell the family that it is safe to care for the person with AIDS. They should wash their hands with soap and water after changing soiled bed sheets or after contact with body fluids. If clothing or sheets are stained with blood or diarrhoea, keep them separate from other washing. First rinse the stain off, holding the cloth by an unstained part. Then wash as normal. Also, keep bed clothes clean. If a family member has open wounds, they should be covered and someone else should wash the patient's clothes and bedding. Do not share toothbrushes, razors, or needles. Finally, to avoid giving other infections to the person with AIDS, wash hands before cooking, eating, feeding another person or giving medicine.

Patients with other contagious diseases

Patients with hepatitis A, typhoid fever, cholera and encephalitis need to be in a separate room only if they cannot control their urine (they are incontinent). Patients with meningitis need to be isolated only for the first 24 hours. Wear a gown or protective apron if available. Wear gloves if you are touching infected material. It is essential to wash your hands after contact with the patient.