SURGICAL ASEPSIS AND ASSISTING WITH SURGICAL PROCEDURES

SCENARIO

Melissa Gelbart, CMA (AAMA), works for a dermatologist, Dr. Susan Armstrong, who frequently performs minor surgical procedures in the office. Melissa was hired to work as an administrative medical assistant at the front desk, but one of the clinical medical assistants has unexpectedly quit, and the office manager has offered Melissa her position. Melissa is excited about this opportunity, but she also is concerned about her skill level in sterile procedures. At least she is familiar with a number of the patients, most of the staff, and the types of outpatient surgeries performed in the facility. Surgical asepsis and assisting with surgery were her favorite topics when she was in medical assisting school. However, before she can assist with surgeries, Melissa must demonstrate her ability to set up a sterile field without contaminating the site. She also must show that she can apply a sterile dressing properly and change sterile bandages.

While studying this chapter, think about the following questions:

- What are the crucial steps Melissa must follow to set up and maintain a sterile field?
- How does an autoclave work and what are the important rules to remember when preparing surgical trays for the autoclave and correctly operating the machine?
- How will Melissa know whether surgical trays processed in the autoclave are actually sterile?
- What techniques must Melissa follow to prepare for and assist with a surgical procedure?
- What are common surgical procedures performed in an ambulatory care facility?
- What is the medical assistant's role in preparing the patient, equipment, and room for a surgical procedure?
- Why is it important that Melissa understand and be prepared to answer patients' questions about the process of wound healing?
- What bandaging techniques should Melissa be prepared to perform?

LEARNING OBJECTIVES

1. Define, spell, and pronounce the terms listed in the vocabulary.
2. Apply critical thinking skills in performing the patient assessment and patient care.
3. Define the concepts of aseptic technique.
4. Explain the differences among sanitation, disinfection, and sterilization.
5. Summarize tips for improving autoclave techniques.
6. Demonstrate how to wrap instrument packs for autoclave sterilization.
7. Explain the types and uses of sterilization indicators.
8. Summarize the correct methods of loading, operating, and unloading an autoclave.
9. Demonstrate how to operate an autoclave
10. Summarize common minor surgical procedures.
11. Detail the medical assistant's role in minor office surgery.
12. Perform a skin prep for surgery.
13. Perform a surgical hand scrub.
14. Outline the rules for setting up and maintaining a sterile field.
15. Open a sterile pack to create a sterile field.
16. Transfer sterile instruments and pour solutions into a sterile field.
17. Apply sterile gloves without contaminating them.
18. Demonstrate how to assist with a minor surgical procedure and suturing.
19. Summarize postoperative instructions and care of wounds.
20. Demonstrate how to remove sutures and the technique of surgical staple removal.
21. Explain the process of wound healing.
22. Properly apply dressings and bandages to surgical sites.
23. Conduct patient education in aseptic technique and surgical procedures.
24. Discuss the legal and ethical concerns regarding surgical asepsis and infection control.
The term *asepsis* is freedom from infection or infectious material. *Medical asepsis* is the destruction of organisms after they leave the body. The principles of medical asepsis are implemented to prevent reinfection of a patient and cross-infection of another patient or ourselves. To prevent cross-contamination, potential microorganisms and pathogens must be isolated by following standard blood and body fluid precautions and by disinfecting or sterilizing objects as soon as possible after they become contaminated. As discussed in Chapter 27, medical asepsis is the process of either reducing the number of pathogens or destroying them; this creates an environment that is clean but not sterile (free of microorganisms).

*Surgical asepsis* is the complete destruction of organisms on instruments or equipment that will enter the patient’s body. This technique is mandatory for any procedure that invades the body’s skin or tissues, such as surgery. Everything that comes in contact with the patient must be sterile, including surgical gowns, drapes, and instruments, as well as the gloved hands of the surgeon and surgical assistants. Any time the skin or a mucous membrane is punctured or pierced, as in venipunctures or injections, aseptic techniques must be practiced. Urinary catheterizations, biopsies, and dressing changes on open wounds are performed using sterile technique.

A medical assistant must develop an inner sense of sterile procedures. It is important that these techniques be performed on such a routine basis that they become an unbreakable habit. Conscientious attention must be given to sterilizing all items at all times. Frequent checking and rechecking of procedures helps ensure that they are effective and are used without any “breaks” in technique. Using single-use, disposable items is the best method of infection control, and they are being used more frequently in medical offices. However, when disposable equipment is used, the assistant must know the specific disposal guidelines for contaminated instruments and supplies.

**STERILIZATION**

Before an instrument or piece of equipment can be used in a surgical procedure, it first must be sanitized, then disinfected, and finally sterilized to remove all forms of microorganisms. Sanitation and disinfection were described in Chapter 27. It is essential that you understand these two concepts, so review them if necessary before learning sterilization methods.

Instruments and other items used in office surgery, examination, or treatment must be carefully cleaned before proceeding with the steps of disinfection or sterilization. Sanitization is the cleansing process that reduces the number of microorganisms to a safe level as dictated by public health guidelines. This cleansing process removes debris such as blood and other body fluids from instruments or equipment. Blood and debris must be removed so that later disinfection with chemicals or sterilization with steam, heat, or gases can penetrate to all the instrument’s surfaces (see Procedure 27-5). The procedure should be completed immediately after the instruments are used. If this is not possible, rinse the used items under cold water immediately after the surgical procedure and place them in a low-sudsing, rust-inhibiting, enzyme-containing, detergent solution. Never allow blood or other substances that can coagulate to dry on an instrument.

The medical assistant should always wear gloves while performing sanitization (thick utility gloves if the instruments have sharp or pointed edges) to prevent possible personal contamination with potentially infectious body fluids that may be present on the articles being cleaned. When you are ready to sanitize instruments, drain off the soak solution and rinse each instrument in cold, running water. Separate the sharp instruments from the others, because metal instruments may damage the cutting edges, and sharp instruments may damage the other instruments or injure you. Clean all sharp instruments at one time, when you can concentrate on preventing injury to yourself. Open all hinges and scrub serrations and ratchets with a small scrub brush or toothbrush. Rinse the instruments in hot water, then check them carefully for proper working order before they are disinfected or sterilized. The items should be hand dried with a towel to prevent spotting.

Disinfection is the process of killing pathogenic organisms or of rendering them inactive. However, it is not always effective against spores, the tubercle bacilli, and certain viruses. Disinfectant chemicals may kill microbes within a short time but are usually very hard on instruments. Some chemicals, such as Cidex, are effective enough to kill all organisms, but the usual immersion time for these sterilants is 10 hours or longer. Many types of disinfecting agents are available and have varying degrees of effectiveness. It is important to follow the manufacturer’s guidelines on the proper use of each product and also to understand the product’s advantages and disadvantages and the possible sources of error.

To ensure proper sterilization for surgical aseptic procedures, an area (usually a utility room) should be set aside in each office for just this purpose. The area should be divided into two sections, one dirty and one clean. The dirty section is used for receiving contaminated instruments and other materials at the conclusion of surgical procedures. This area should have a sink, receiving basins, proper cleaning agents, brushes, utility gloves, autoclave wrapping paper or cloth, autoclave envelopes and tape, sterilizer indicators, and disposable gloves. Designated biohazardous waste containers are needed for gloves worn when handling contaminated items. Personal protective equipment (PPE) for autoclave procedures includes:

- Heat-resistant autoclave gloves for loading and unloading
- Fluid-resistant gloves to prevent contact with contaminants
- A laboratory coat or impervious gown, if needed, to protect against splashes
- A face shield and/or goggles if a splash hazard exists

The clean section of the utility room should be reserved for receiving the sterile items after they have been removed from the sterilizer. Clear, clean plastic bags in which to store sterile packs may be kept in the clean area. Both areas should be spotlessly clean and well organized. Sterilization can be achieved by moist heat in an autoclave, by gas, or with chemicals. Most medical offices use the autoclave method. A written sterilization procedure should be in place for each workplace.

**Critical Thinking Application 57-1**

The office manager told Melissa she needs to review the office policy and procedures manual on surgical supplies and sterilization methods. Why is this important before Melissa starts performing sterilization procedures? What information in this manual would be most important to Melissa as she starts this new position? Why?

---

**Autoclave**

Steam under pressure in the autoclave (Figure 57-1) is the best method of sterilization, because it kills all pathogens and spores. Pressurized steam is fast, convenient, and dependable. The pressure allows for heat higher than the boiling point, and when combined with moisture, these two factors create a very effective mechanism for killing all microorganisms. When steam is admitted into the autoclave chamber, it simultaneously heats and wets the object, coagulating the proteins present in all living organisms. When the cycle is complete and the chamber has cooled, the steam condenses and explodes the cells of microorganisms, thus destroying them. To be effective, the steam moisture must come in contact with all surfaces being sterilized. Steam under pressure is capable of much faster penetration of fabrics and textiles than dry heat, but its use has definite limitations if the proper techniques are not followed.

The recommended temperature for sterilization in an autoclave is 121°C to 123°C (250°F to 255°F). Unwrapped items should be sterilized for 20 minutes, small wrapped items for 30 minutes (Table 57-1), and large or tightly wrapped items for 40 minutes. Processing time starts after the autoclave reaches normal operating conditions of 121°C (250°F) and 15 pounds per square inch (psi) pressure.

The three basic autoclave cycles are as follows:

- **Gravity (fast exhaust) cycle:** This cycle is used to sterilize stainless steel instruments, glassware, and so on. The autoclave fills with steam and is held at a set temperature for a set period. When the cycle is complete, a valve opens and the chamber rapidly returns to atmospheric pressure. Drying time may be added to the end of the cycle. This is the cycle most often used in the physician's office setting.

- **Liquid (slow exhaust) cycle:** This cycle is used to prevent sterilized liquids from boiling. Steam is exhausted slowly at the end of the cycle, allowing the liquids to cool.

- **Prewarm cycle:** This cycle is used for porous materials. The chamber is partially evacuated before the introduction of steam for greater steam penetration; this is not available on all machines.

Incorrect operation of an autoclave may result in superheated steam. If steam is brought to too high a temperature, it is literally dried out, and the advantage of a higher heat is diminished. Wet steam is another cause of incomplete sterilization. Wet steam

---

**TABLE 57-1 Sterilization Chart**

<table>
<thead>
<tr>
<th>ARTICLE</th>
<th>METHOD</th>
<th>TEMPERATURE (°F)</th>
<th>TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gauze, small, loosely packed</td>
<td>Autoclave</td>
<td>250</td>
<td>30 min</td>
</tr>
<tr>
<td>Gauze, large, loosely packed</td>
<td>Autoclave</td>
<td>270</td>
<td>30 min</td>
</tr>
<tr>
<td>Gauze, small, tightly packed</td>
<td>Autoclave</td>
<td>250</td>
<td>40 min</td>
</tr>
<tr>
<td>Gauze, large, tightly packed</td>
<td>Autoclave</td>
<td>270</td>
<td>40 min</td>
</tr>
<tr>
<td>Gauze, tightly packed</td>
<td>Dry heat</td>
<td>320</td>
<td>3 hr</td>
</tr>
<tr>
<td>Gauze, loosely packed</td>
<td>Dry heat</td>
<td>320</td>
<td>2 hr</td>
</tr>
<tr>
<td>Glass syringes in tubes</td>
<td>Autoclave</td>
<td>250</td>
<td>30 min</td>
</tr>
<tr>
<td>Glass syringes in muslin</td>
<td>Dry heat</td>
<td>320</td>
<td>1 hr</td>
</tr>
<tr>
<td>Instruments on tray, muslin under and over</td>
<td>Dry heat</td>
<td>320</td>
<td>1 hr</td>
</tr>
<tr>
<td>Instruments on tray, muslin under and over</td>
<td>Autoclave</td>
<td>250</td>
<td>15 min</td>
</tr>
<tr>
<td>Solutions in flasks with gauze plug</td>
<td>Autoclave</td>
<td>250</td>
<td>30 min</td>
</tr>
<tr>
<td>Glassware unwrapped</td>
<td>Dry heat</td>
<td>320</td>
<td>1 hr</td>
</tr>
<tr>
<td>Glassware wrapped</td>
<td>Autoclave</td>
<td>250</td>
<td>30 min</td>
</tr>
<tr>
<td>Petroleum jelly, 1-ounce jar</td>
<td>Dry heat</td>
<td>340</td>
<td>1 hr</td>
</tr>
<tr>
<td>Petroleum jelly, 2-ounce jar</td>
<td>Dry heat</td>
<td>320</td>
<td>2 hr</td>
</tr>
<tr>
<td>Petroleum gauze in instrument tray</td>
<td>Dry heat</td>
<td>320</td>
<td>150 min</td>
</tr>
<tr>
<td>Powder, 1-ounce jar</td>
<td>Dry heat</td>
<td>320</td>
<td>2 hr</td>
</tr>
<tr>
<td>Powder, small glove packs</td>
<td>Autoclave</td>
<td>250</td>
<td>15 min</td>
</tr>
</tbody>
</table>

*Remember always to place sterilization indicators in areas where there is doubt the steam will penetrate. Do not assess effectiveness by chamber pounds per square inch; a temperature and sterilization indicator are the reliable methods of judging a killing temperature.*
results from failing to preheat the chamber, which causes excessive condensation in the interior of the chamber. Condensation is necessary, but too much prevents the sterilization process from being completed properly. It can be compared with taking a hot shower in a cold bathroom, which results in heavily steamed mirrors, walls, and towels. If packs become too saturated to dry during the drying cycle, the packs pick up and absorb bacteria from the air or any surface on which they are placed after removal from the autoclave. Placing cold instruments in a hot chamber also increases condensation. Other causes of wet steam include opening the door too wide at the end of the cycle or allowing a rush of cold air into the chamber. Overfilling the water reservoir may produce this same effect.

The main cause of incomplete sterilization in the autoclave is the presence of residual air. Without the complete elimination of air, an adequate high temperature cannot be reached. Air and steam do not mix. Because air is heavier than steam, it pools wherever possible. One tenth of 1% (0.1%) residual air trapped around an instrument prevents complete sterilization. This is especially dangerous in older autoclaves that do not have a chamber thermometer separate from the pressure gauge. Adequate chamber pressure does not guarantee a proper chamber temperature. Table 57-2 provides tips for improving autoclave techniques.

### Wrapping Materials
Maintenance of sterility depends completely on the wrapper and method of wrapping (Procedure 57-1). The wrapping material must be permeable to steam but impervious to contaminants. Acceptable wrapping materials for autoclaving should be made of a substance that allows the steam to penetrate while preventing pathogens from entering during storage and handling. A wrapper should not be used if it is torn or has a hole in it. Clean muslin, disposable autoclave paper, and polypropylene bags are examples of autoclave instrument wraps (Figure 57-2).

### Wrapping Instruments
The method used to wrap instruments for autoclave sterilization must allow the pack to be opened without becoming contaminated. The rules for protecting package contents include the following:

---

**TABLE 57-2 Tips for Improving Autoclave Techniques**

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>CAUSES</th>
<th>CORRECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Damp linens</td>
<td>Clogged chamber drain; goods removed from chamber too soon after cycle; improper loading</td>
<td>Remove strainer; free openings of lint. Allow goods to remain in sterilizer an additional 15 min with door slightly open. Place packs on edge; arrange for least possible resistance to flow of steam and air.</td>
</tr>
<tr>
<td>Stained linens</td>
<td>Dirty chamber</td>
<td>Clean chamber with Colgonite solution; never use strong abrasives, such as steel wool; rinse thoroughly after cleaning.</td>
</tr>
<tr>
<td>Corroded instruments</td>
<td>Poor cleaning; residual soil; exposure to hard chemicals (e.g., iodine, salt, and acids); inferior instruments</td>
<td>Improve cleaning; do not allow soil to dry on instruments; sanitize first. Do not expose instruments to these chemicals; if exposure occurs, rinse immediately. Use only top-quality instruments.</td>
</tr>
<tr>
<td>Spotted or stained instruments</td>
<td>Mineral deposits on instruments; residual detergents from cleaning; mineral deposits from tap water</td>
<td>Wash with soft soap and detergent with good wetting properties. Rinse instruments thoroughly with distilled water.</td>
</tr>
<tr>
<td>Instruments with soft hinges or joints</td>
<td>Corrosion or soil in joint; instrument parts out of alignment</td>
<td>Clean with warm, weak acid solutions (10% nitric acid solution); rinse thoroughly. Have instrument realigned by qualified instrument repair professional.</td>
</tr>
<tr>
<td>Ebullition, or caps that blow off solutions</td>
<td>Too rapid exhausting of chamber</td>
<td>Use slow exhaust, cool liquids, or turn autoclave off and let cool on its own; that is, let the pressure drop at its own rate.</td>
</tr>
<tr>
<td>Steam leakage</td>
<td>Worn gasket; door closes improperly</td>
<td>Replace gasket; reopen door and shut carefully; have serviced if unable to close door properly.</td>
</tr>
<tr>
<td>Chamber door does not open</td>
<td>Vacuum in chamber (check chamber pressure gauge)</td>
<td>Turn on controls to starting steam pressure; wait until equalized, then vent and open door.</td>
</tr>
</tbody>
</table>
Prepare Items for Autoclaving: Wrap Instruments and Supplies for Sterilization in an Autoclave

GOAL: To place dry, checked, sanitized, and disinfected supplies and instruments inside appropriate wrapping materials for sterilization and storage without contamination.

EQUIPMENT and SUPPLIES
- Dry, checked, sanitized, and disinfected items
- Autoclave paper or cloth wrapping material
- Autoclave tape
- Sterilization indicator
- Waterproof, felt-tipped pen
- Disposable gloves (if part of office policy)

PROCEDURAL STEPS
1. Sanitize your hands. Collect and assemble already sanitized and disinfected items to be wrapped. Gloves may be worn.
2. Place the wrapping material on a clean, flat surface.
3. Place the item (or items) diagonally at the approximate center of the wrapping material. Make sure the size of the square is large enough for the items (Figure 1).
   PURPOSE: Each of the four corners must fold over and completely cover the items, with a few extra inches of overlap for folding.
4. With the squares that are cloth fabric, use two pieces if the cloth is single layered; follow the manufacturer’s recommendation when using commercial autoclave wrapping paper.
   PURPOSE: To ensure sterility until the sterile item is needed for use.
5. Open any hinged instruments. If the instrument is sharp, its teeth or tip should be shielded with cotton or gauze.
   PURPOSE: To prevent puncture of the package or injury to the operator.
6. If the package is to contain several items, place a commercial sterilization indicator inside the package at the approximate center.
   PURPOSE: To ensure that the autoclave is reaching effective levels of heat and pressure.
7. Bring up the bottom corner of the wrap and fold back a portion of it.
   PURPOSE: This folded-back flap is the only part of each wrapper corner that can be touched when a sterile package is opened (Figure 2).
8. Repeat the above step with each corner, making sure to turn back a portion each time (Figures 3 and 4).
9. Fold the last flap over (Figure 5).
10. Secure with autoclave tape (Figure 6).
11. Secure with autoclave tape and label the package with the date, including the year, contents, and your initials (Figure 7).
   PURPOSE: So that staff members will know what is in the pack at a later date, whether the shelf life has expired (expiration date), and who performed the task. As a general rule, most office-autoclaved packs are considered sterile (usable) for up to 28 days.
PROCEDURE 57-1—cont’d

- Inspect muslin wrappers for holes before each use and discard if any holes are found.
- Wrap all hinged instruments in the open position to allow full steam penetration of the joint.
- Place a gauze sponge around the tips of sharp instruments to prevent them from piercing the wrapping material.
- If a number of instruments are to be placed on a stainless steel tray for wrapping, first place a double-folded towel on the tray, then position the instruments. This helps to protect them.
- Polypropylene is a plastic capable of withstanding autoclaving but is resistant to heat transfer. Therefore, materials in a polypropylene pan take longer to autoclave than the same materials in a stainless steel pan.
- When using sterilizing bags, insert the jaws of the instruments first to ensure that the grasping end of the instrument can be reached easily when the bag is opened.

- Indicate on the wrapper what is in the package or label it with a code. This code should correspond with a list of instruments that are stored with the pack after sterilization.
- Label each pack according to the instrument contents, sterilization date, and your initials. Use a permanent marker, never a ballpoint pen.
- Whether you are wrapping one item or many items together on a tray as a surgical pack, the procedure is the same; be sure the wrapper is large enough to cover the items to be sterilized.

CRITICAL THINKING APPLICATION 57-2
Melissa is processing instruments and trays when she notices that one of her co-workers never inspects a muslin wrapper before wrapping a pack. What is the significance of Melissa's observation? How should she handle this situation? Why?
Sterilization Indicators

Sterilization is achieved only when steam reaches the optimum temperature for a designated length of time and has penetrated to the center of the articles. Sterilization indicators must be used routinely to determine whether all microorganisms have been destroyed. The two basic types of sterilization indicators are chemical indicators (autoclave tape) and biologic indicators (bacterial spore strips).

Chemical Sterilization Indicators. Autoclave tape, a commonly used sterilization indicator, contains a chemical dye that changes color when exposed to steam (Figure 57-3). The tape is not an absolute indication that the proper sterilization time, temperature, and steam have been maintained; it merely indicates that a high temperature was reached while the article was in the autoclave. The strip must completely change color (colors vary by manufacturer) or reveal the word “autoclaved” to ensure effective operation. The main function of autoclave tape, besides holding the wrapping material together or closing a sterilization bag, is to verify that the package has been autoclaved.

Biologic Sterilization Indicators. The facility should have a policy for how frequently the autoclave is tested using biologic methods. One type, a spore strip indicator, contains a temperature-sensitive dye that changes color when the proper combination of steam, temperature, and time has been achieved. An indicator strip should be placed in the center of the largest pack that typically would be autoclaved in the facility to determine the accuracy of the autoclave and autoclave procedures. Test indicator kits are available that use ampules of Bacillus stearothermophila, which is destroyed at 121°C (250°F). On completion of the cycle, the ampule is sent to the laboratory for analysis of any type of microbial growth, which would indicate that the autoclave is not sterilizing properly.

Quality Assurance Records for Office Sterilization

Every office should have specific protocols to follow for quality-assurance evaluations of the autoclave. This is done at specified intervals, depending on the volume and frequency of autoclave use. A log must be kept of the type of control test done, when it was performed, and the testing results. If the testing results indicate that sterilization was inadequate, a report must be made and filed. The report should identify the nature of the problem and how and when it was corrected. The report also should contain proof of correction by indicating the date and time of a first, subsequent, and successful sterilization run.

Loading the Autoclave

Prepare all packs and arrange the load in a way that allows maximum circulation of steam and heat (Procedure 57-2). Articles should be resting on their edges and should not be crowded. Placing the packs in stainless steel racks prevents packing of the autoclave too tightly. Jars, bottles, and trays must be wrapped and placed on their sides if they are to be used to store sterile items. Covers on jars and containers should be put to one side or left open to allow steam to penetrate. Extreme care must be taken not to contaminate jars when replacing their lids after autoclaving.

Instruments may be autoclaved unwrapped if they do not need to be sterile when used later. For example, although vaginal speculums do not need to be sterilized for use (the vagina is a body cavity that is naturally open to the external environment), they must be sanitized, disinfected, and sterilized to prevent cross-contamination among patients. They can be placed unwrapped on a perforated stainless steel tray in the autoclave and then stored in a clean area for future use.

Unloading Guidelines

When the autoclave’s sterilization cycle is complete, release the pressure according to the manufacturer’s guidelines. Once the pressure gauge reads “0,” stand back from the door and, with heat-resistant gloves, open the door approximately ¼ inch. Allow the load to dry for at least 15 minutes (this time varies according to the type of autoclave and the size of the load). Capillary attraction is the action that draws moisture through the surface of materials. Packs can act like a sponge, attracting outside moisture
PROCEDURE 57-2

Perform Sterilization Procedures: Operate the Autoclave

**GOAL:** To sterilize properly prepared supplies and instruments using the autoclave.

**EQUIPMENT and SUPPLIES**
- An autoclave
- Wrapped items ready to be sterilized
- Heat-resistant gloves

**PROCEDURAL STEPS**

1. Check the water level in the reservoir and add distilled water as necessary.
   **PURPOSE:** Too much or too little water may alter the effectiveness of the equipment. Tap water leaves lime deposits in the chamber.

2. Turn the control to “Fill” to allow water to flow into the chamber. The water flows until you turn the control to its next position. Do not let the water overflow.

3. Load the chamber with wrapped items, spacing them for maximum circulation and penetration.
   **PURPOSE:** To ensure sterilization of all items.

4. Close and seal the door.
   **PURPOSE:** The door must be closed, or the heated water in the chamber evaporates.

5. Turn the control setting to “On” or “Autoclave” to start the cycle.

6. Watch the gages until the temperature gauge reaches at least 121°C (250°F) and the pressure gauge reaches 15 pounds (lb) of pressure.
   **PURPOSE:** The proper temperature and pressure must be reached before sterilization can begin.

7. Set the timer for the desired time.

8. At the end of the timed cycle, turn the control setting to “Vent.”
   **PURPOSE:** This releases the steam and pressure. The water at the bottom of the chamber drains back into the reservoir.

9. Wait for the pressure gauge to reach zero.

10. While facing directly toward the autoclave door, carefully open the chamber door ¹⁄₄ inch.
    **PURPOSE:** To allow steam to escape faster. Be careful to prevent accidental burns.

11. Leave the autoclave control at “Vent” to continue releasing heat.
    **PURPOSE:** To dry the items faster.

12. Allow complete drying of all articles.

13. Using heat-resistant gloves, remove the items from the chamber and place the sterilized packages on dry, covered shelves or open the autoclave door and allow the items to cool completely before removal and storage.

14. Turn the control knob to “Off” and keep the door slightly ajar.
    **PURPOSE:** To allow the inside of the autoclave to dry completely.

**Shelf Life of Sterilized Packs.** Each office has its own guidelines for the shelf life of sterile packs. Generally, muslin and autoclave paper packs are considered sterile for up to 28 days from the date of sterilization. Polypropylene autoclave bags are sterile for up to 6 months from the sterilization date. All sterile packs should be stored on dry, dust-free, covered shelves or in drawers. Fabric wrappers must be inspected for holes and laundered after each use. A damaged pack or a broken seal renders the package non-sterile; spills of any fluid onto a package also contaminate it. When a pack is no longer sterile for any reason, including the expiration date, the contents must be reprocessed as if the pack had been used for surgery. The contents must be sanitized, disinfected, wrapped, and sterilized as usual.

**CRITICAL THINKING APPLICATION 57-3**

Melissa discovers a number of packages of paper-wrapped sterile instruments that have no dates on them. The indicator tape shows that they have been autoclaved. What should she do with these packs? Why?

**Gas Sterilization**

A variety of gas sterilizers are available. Each has its own very specific operating guidelines to ensure operator safety. Because of the long processing times, the very specific requirements for gas
ventilation established by the Occupational Safety and Health Administration (OSHA), and the hazards of reproductive organ damage and cancer associated with gas sterilization, it is unrealistic to use gas sterilization in the physician’s office.

## Chemical Sterilization

In the medical office, chemical sterilization is used for instruments that cannot be exposed to the high temperatures of steam sterilization. The sterilizing chemical solution must be mixed exactly according to the instructions on the bottle. The solution must be marked with the date of preparation and expiration. Materials to be sterilized must be submerged in this chemical bath with a closed lid for 8 hours or longer. Items are removed with sterile forceps and must be rinsed with sterile water to remove all traces of the chemical before the items are used on a patient. Removed items are then dried with a sterile towel. You must avoid skin contact with the sterilizing solution because it is very caustic.

## Surgical Procedures

Common surgical procedures that are routinely performed in the primary care office include suturing, cyst removal, incision and drainage (I&O) of abscesses, and collection of biopsy specimens. The medical assistant should be proficient in explaining each of these procedures to the patient, preparing the patient and the room, assisting the physician with the surgery, and applying a sterile dressing and bandage after the procedure is finished.

Each surgical procedure requires appropriate skin preparation and draping with a fenestrated drape, also called an eye sheet. This is a surgical drape with an opening in the center. The size of the opening depends on the size of the surgical field. The opening is placed directly over the surgical site after the site has been suitably prepared (or “prepped,” as it is called in healthcare practice). A minor surgery tray is opened, and a sterile field is created on a Mayo instrument stand. Sutures, scalpels, and any other instruments needed are added to the field, according to the surgeon’s preference. Have a local anesthetic ready, also according to the physician’s preference.

After achieving suitable local anesthesia, the physician opens the skin with an incision. If a cyst is being removed, the physician dissects around it and usually tries to “deliver” it from the wound intact. If the procedure is an I&O, foul matter will start oozing from the wound immediately after the skin is incised. The wound is drained completely and flushed with copious amounts of sterile saline solution. A drain may be placed in the wound and left for several days. If the procedure is a biopsy, a small amount of tissue is removed and placed in a specimen container with preservative. The specimen container must be carefully labeled with the appropriate patient information, the date, and specifics about the specimen type and location. It then is sent to the laboratory, where it is examined microscopically for changes or abnormalities.

## Electrosurgery

Electrosurgery is also known as electrocautery. An electrosurgical unit (ESU) uses high-frequency current to cut through tissue and coagulate blood vessels. A small probe with an electric current running through it is used to cauterize (burn or destroy) the tissue. When the electric current comes in contact with tissue and blood cells, they are vaporized, producing carbon and steam. This process seals blood vessels, minimizing cellular oozing and bleeding. Electrosurgery may be used to destroy granulations and small polyps.

Necessary components are the ESU’s power source, the grounding cable and pad, and the active electrode (a pencil-like instrument with a tip and cord). Tips are disposable and are used according to the type of procedure performed. The two most commonly used tips are the needle and flat designs.

Holding the pencil-like instrument, the surgeon touches the tissue with the tip and activates the electric current with a switch on the instrument or a foot pedal. The electric current is delivered to the tissues, and tissue is vaporized at the site of contact.

### Important Tips About the Grounding Pad

- Carefully inspect the pad, cable, and skin before the procedure.
- Place the pad close to the operative site.
- The pad must be tight against the patient’s skin.
- Apply the pad to a fleshy area, such as the thigh.
- Do not place the pad over a bony area.
- Do not place the pad over body hair.
- Do not place the pad over metal implants or a pacemaker.
- Carefully inspect the pad site on the skin after the procedure.

## Laser Surgery

Laser is an acronym for light amplification by stimulated emission of radiation. Because a laser beam is so small and precise, it can be used to safely treat specific tissue with minimal damage to surrounding tissues and limited scar formation. Lasers were first used in medicine to treat diseases of the retina, and they now are used for many procedures, including excision of lesions, cauterization of blood vessels, removal of warts or moles, and cosmetic surgical procedures.

Several types of lasers are used, including the carbon dioxide, yttrium-aluminum-garnet (YAG), and pulsed dye lasers. Each laser has a specific use. The color of the laser light beam is directly related to the type of surgery performed.

A medical assistant must be specially trained to operate a laser before assisting with laser surgery. Laser equipment requires very careful handling, care, and maintenance. Laser light destroys tissue and can harm the patient, the physician, and you if handled improperly. The medical assistant should complete a full laser safety program before assisting in laser procedures. Once trained, the medical assistant’s role during laser surgery includes:

- Observing the surgical field through safety goggles for possible contamination and protecting the patient’s eyes
- Keeping wet sponges ready
- Removing any flammable item from the laser’s path
- Assisting with suctioning of the plume to maintain a clear visual field
- Having a basin of sterile normal saline solution and a filled irrigating syringe ready
- Watching each application of the laser beam and anticipating the need for protective supplies, special equipment, or instruments

**Microsurgery**

Microsurgery involves the use of an operating microscope to perform delicate surgical procedures. One of its major uses is in ophthalmologic surgery. It also is used in otologic, rhinologic and sinus, laryngologic, neurosurgical, microvascular, gynecologic, and genitourinary procedures. A medical assistant must acquire a basic knowledge of the operation and care of a microscope before becoming qualified to assist in these types of procedures.

The basic components of an operating microscope are the light source, eyepieces (also called the oculars), lenses, and cord. Accessory pieces include assistant and observer lenses, cameras, video recorders, television monitors, and printers. These are all valuable for documentation and teaching purposes. Disposable sterile drapes and handle covers are used on the microscope during surgical procedures.

Surgical microscopes are expensive, delicate instruments that require extreme care in handling and cleaning. All lenses and cords should be carefully inspected before and after each use.

**Endoscopic Procedures**

An endoscope is a medical device consisting of a miniature camera mounted on a flexible tube with an optical system and a light source that is used to examine the area inside an organ or cavity. Many types of endoscopes are used, and they are named according to the organs or areas they are used to explore, such as the urinary bladder, bronchus, larynx, colon (Figure 57-4), stomach, uterus, abdomen, and various joints. Small instruments can be used to take samples of suspicious tissues through the endoscope.

Direct visualization with an endoscope is used for diagnostic purposes or to perform surgical procedures. Endoscopes may be rigid (e.g., laparoscope or hysteroscope), semi-rigid, or flexible (colonoscopy, bronchoscopy, gastroscopy). All are delicate and expensive and require extreme care in handling to protect them from damage.

Accessory equipment used with endoscopes includes fiberoptic light cables and light source; irrigators for solution instillation and suction; and a camera, monitor, printer, and video recorder. The fiberoptic light cable consists of hundreds of glass fibers. It is important to protect it from being bent, dropped, kinked, squashed, or smashed. The light source can become very hot and must be kept out of contact with the patient, the physician, the staff, and any flammable material, such as surgical draping. All equipment must be checked before and after use. Always follow the manufacturer’s recommendations for use, care, and maintenance of equipment.

**Cryosurgery**

Cryosurgery involves the use of a very-low-temperature probe to destroy tissue by freezing it on contact. The probe’s temperature usually is below −20°C (4°F). This cold temperature is achieved by circulating liquid nitrogen through the tip of the probe. A local anesthetic usually is administered before cryosurgery. Cryosurgery is used to treat cancers of the skin, prostate, liver, pancreas, and kidney. In many situations, cryosurgery is less invasive than traditional surgery and therefore generally has fewer associated complications. Cryosurgery often is performed in an office setting or in an outpatient surgery center.

**ASSISTING WITH SURGICAL PROCEDURES**

Surgery performed in a medical office is restricted to the management of minor problems and injuries. The medical assistant is expected to assist with preparing the patient and setting up the sterile field. The following procedures must be used without exception when assisting with minor surgery. Individual facilities may have specific guidelines for some of these procedures; however, the theory behind sterile technique is universal, regardless of where you work.

**Preparation of the Patient**

Whether minor surgery is performed because of an unforeseen accident or is a planned, elective procedure, the patient needs both psychological and physical support. A patient facing a surgical procedure may be concerned about pain, disfigurement, and a possible diagnosis of cancer. An injured patient may feel anxious about medical bills or possible loss of employment. Because surgery is a frightening experience, the medical assistant must take the time, both preoperatively and at the time of surgery, to help the patient deal with fears and anxieties. The best way to help is to make sure that the patient understands the details of the procedure, that all questions are answered by the physician, and that the patient has the opportunity to talk about the procedure and voice any concerns.

Questions should be answered directly, but you should answer only the questions that are within your scope of knowl-
edge and the policies of the office. If you cannot answer a question, assure the patient that you will relay it to the physician before the procedure and then be sure to do so. What may seem to be a minor or unimportant question to you may be a very frightening concern to the patient. The minor surgery room can be intimidating, so unless the patient is sedated, try to make conversation with him or her while you prepare for the physician’s arrival.

Preoperative preparation may include blood and urine tests, completion of a consent form, and gathering of the current history concerning any recent illnesses, medications, and allergies. Patient preparations before surgery may include a shave prep, cleansing enemas, food intake restrictions, special bathing, and administration of a sedative medication. On the day of surgery, the patient is instructed to empty the bladder and undress and gown as requested. The vital signs are recorded in preparation for the procedure.

Preoperative Instructions
When office surgery is planned, certain procedures are followed before the appointment. These include the following:

- Having the necessary consent forms ready to sign
- Giving the patient the necessary preoperative instructions, such as medications to be used and special skin-cleansing instructions
- Telling the patient to bring a relative or friend to drive him or her home after the surgery
- Instructing the patient to leave jewelry and other valuables at home
- Calling the patient the day before the scheduled surgery to confirm any special instructions

Informed Consent
The physician must have the patient’s written informed consent before beginning any surgical procedure. To sign an informed consent form permitting the physician to legally perform the surgery, the patient must understand what procedure will be performed, why it should be done, the potential risks and benefits of the surgery, alternative treatments (including no treatment), and the possible risks of any alternative treatment. This legal requirement is not met simply by having the patient sign an operative permit; a discussion must occur, during which the physician provides the patient or the patient’s legal representative with enough information to enable the person to decide whether to proceed with the proposed surgical treatment. After this discussion, the patient either consents to or refuses the surgery. The patient then signs or refuses to sign the consent form. If the patient signs with an X, the medical assistant should write “patient’s mark” beside the X and also should have a family member witness the signature. The discussion must be fully documented in the patient’s medical record. A copy of the signed form must also be included in the patient’s record. Treatment may not exceed the scope of the consent form.

The patient must not be under the influence of any sedative medication at the time he or she signs the consent form. This condition must never be violated.

CRITICAL THINKING APPLICATION

Melissa is preparing a patient for a breast biopsy. The consent form has been signed and is in the chart. While Melissa is charting with the patient during completion of the final setup for the procedure, it becomes clear the patient thinks she is having a “cyst removed” from her breast. What action should Melissa take, if any? What is the significance of what the patient said in this situation?

Positioning
Have the patient disrobe sufficiently to expose the surgical site completely so that accidental contamination does not occur during the procedure. Clothing may also act as a tourniquet or may make applying a proper dressing or bandage difficult. In addition, the patient’s clothing may be stained by the skin prep solution or may interfere with adequate site preparation.

The patient needs to be positioned as comfortably as possible for the procedure. An uncomfortable position can be held for only a limited time, and the patient may have to move, perhaps in the middle of a procedure, if you have not ensured his or her comfort from the beginning. When deciding on the correct position, consider where you and the physician will stand or sit, where the instruments will be placed, and where other needed equipment will be located. If the patient has an open wound that will need irrigation during the procedure, wear nonsterile gloves to assist the patient into position. If there is active and profuse bleeding, an impermeable gown and gloves should be worn. If there is danger of blood and body fluid contamination to your face or eyes, wear goggles, a mask, or a face shield.

Skin Preparation
The human skin is a reservoir of bacteria, but it cannot be sterilized without the risk of damaging cells and tissues. The goal of adequate skin preparation for a surgical procedure is to reduce the number of transient and resident microorganisms so that transference of harmful organisms at the incision site is limited. Cleansing the patient’s skin before surgery with surgical soap and an antiseptic and shaving the area if needed is called a skin prep (Procedure 57-3). Sometimes the patient may be instructed to repeatedly cleanse the surgical area with bacteriostatic or antiseptic soap several days before the surgery. Disposable skin prep trays and razors are commonly used in a physician’s office.

Preparation of the Room
If you are to assist in a minor surgical procedure, study the physician’s care preferences, review the procedure, and note the materials needed. Next, prepare the room and gather the supplies to be used. Sterile supplies are opened just before the procedure. Opened materials that have been exposed longer than 1 hour, usually because of a delay, are considered nonsterile. Supplies should not be placed where they can be knocked over or dropped. Wrapped sterile supplies that fall to the floor must not be used.
PROCEDURE 57-3

Assist the Physician with Patient Care: Perform Skin Prep for Surgery

GOAL: To prepare the patient’s skin and remove hair from the surgical site to reduce the risk of wound contamination.

EQUIPMENT and SUPPLIES

- Disposal skin prep kit containing the following:
  - Gauze sponges
  - Cotton-tipped applicators
  - Antiseptic soap
  - Disposable gloves
  - Disposable razor
  - Two small bowls
  - Antiseptic or antiseptic swabs (e.g., Betadine swabs)
  - Sterile normal saline solution
  - Optional: cotton balls, nail pick, scrub brush
- Sterile drape
- Biohazardous sharps container and waste receptacle
- Patient’s record

PROCEDURAL STEPS

1. Sanitize your hands.
   PURPOSE: To follow Standard Precautions.
2. Instruct the patient in the skin preparation procedure, making sure the person understands the procedure and the rationale for it.
   PURPOSE: To ensure cooperation and demonstrate awareness of possible patient concerns.
3. Ask the patient to remove any clothing that might interfere with exposure of the site and provide a gown if needed.
4. Assist the patient into the proper position for site exposure. Provide a drape if necessary to protect the patient’s privacy.
5. Expose the site. Use a light if necessary.
6. Put on gloves and open the skin prep pack.
7. Add the antiseptic soap to the two bowls.
8. Start at the incision site and begin washing with the antiseptic soap on a gauze sponge in a circular motion, moving from the center to the edges of the area to be scrubbed (Figure 1).
   PURPOSE: A circular motion from inside to outside drags contaminants away from the incision site.
9. After one complete wipe, discard the sponge and begin again with a new sponge soaked in the antiseptic solution.
   PURPOSE: After one circular sweep, the sponge is contaminated with skin bacteria and debris.
10. When you return to the incision site for the next circular sweep, you must use clean material.
11. Repeat the process, using sufficient friction for 5 minutes (or follow office policy for the length of time required for a particular prep).
12. If hair is present, the area may need to be shaved. Hold the skin taut and shave in the direction of growth (Figure 2). Take care to prevent injury to yourself or your patient. Immediately after completion, dispose of the razor in the sharps container.
13. After shaving, scrub the skin a second time.
14. Rinse the area with a sterile normal saline solution (Figure 3).
15. Dry the area, using the same circular technique with dry sponges. The area may be dried by blotting with a sterile towel.
16. Paint on the antiseptic with the cotton-tipped applicators or gauze sponges, using the same circular technique and never returning to an area that has already been painted (Figure 4).
17. Place a sterile drape and/or towel over the area.
18. Answer all patient questions to relieve anxiety about the upcoming surgical procedure.

FIGURE 1

FIGURE 2
Once supplies have been opened, the sterile field should be covered with a sterile drape, and a team member should stay in the room to monitor them. Make sure the patient and family members understand that they should not approach or touch the sterile field.

Sterile Technique
Accurately performing surgical aseptic technique involves a degree of dexterity and vigilance that can come only with practice. It requires a great deal of concentration and planning of all movements and procedural steps. The procedures covered in this chapter are for minor surgery, but they are the same techniques used during major surgery. To develop a sound knowledge of sterility and sterile technique, use the following memory aid: Everything sterile is white and everything that is not sterile is black. There is no gray! Sterile surfaces must never come in contact with nonsterile surfaces. If this occurs, the sterile surface immediately is considered contaminated or nonsterile. Constant vigilance and absolute honesty are essential for maintaining sterile techniques. When a sterile surface comes in contact with a nonsterile item, this is called a “break” in sterility or a “break” in the sterile field. During any procedure, everything must stop at this point and the “break” must be corrected immediately—which usually means the assistant must start over again at the very beginning of the procedure. Any break could lead to serious wound contamination, postoperative infection, and even death.

Before assisting with minor surgery, the medical assistant must perform a series of procedures to ensure surgical asepsis (Procedures 57-4 to 57-8). These skills must be learned, practiced, and followed precisely to establish and maintain the sterile environment required during a surgical procedure. Medical asepsis directly affects the health and well-being of the patient, the physician, and the office staff and must be practiced without fail.

Critical Thinking Application 57-5
After completing a surgical scrub before assisting with a minor surgical procedure, Melissa sneezes. She does not touch her face, but instinctively raises her hands toward her face in the “sneeze range.” Can she go ahead with putting on her sterile gloves? Why or why not?

Sterile Field
A sterile field is any sterile surface on which sterile items are placed. In the office, a sterile field most often is set up on a Mayo stand (Figure 57-5). In surgery, a sterile field is created by draping sterile towels (either disposable or from autoclaved packs) over a Mayo stand or table. The surgical site on the patient’s skin is prepared and then draped with sterile towels or drapes so that it, also, becomes a sterile field.

Hands and hair are two of the greatest sources of contamination when a sterile field is set up. With practice, you will learn to know what may be touched with your hands and what must be touched only with sterile gloved hands. Hair that falls freely

Text continued on page 1259
PERFORMED HAND WASHING: PERFORM A SURGICAL HAND SCRUB

GOAL: To scrub the hands with surgical soap, using friction, running water, and a sterile brush to sanitize the skin before assisting with any procedure that requires surgical asepsis.

EQUIPMENT and SUPPLIES
- Sink with foot, knee, or arm control for running water
- Surgical soap in a dispenser
- Towels (sterile towels if indicated by office policy)
- Nail file or orange stick
- Sterile brush

PROCEDURAL STEPS

1. Remove all jewelry.
   PURPOSE: Jewelry harbors bacteria and is not permitted in surgical asepsis.

2. Roll long sleeves above the elbows.

3. Inspect your fingernails for length and your hands for skin breaks.

4. Turn on the faucet and regulate the water to a comfortable temperature, being careful to stand away from the sink to prevent contamination of clothing.

5. Keep your hands upright and held at or above waist level (Figure 1).
   PURPOSE: Water running from the unscrubbed area above the elbow down to the hands can carry bacteria back onto the hands. All areas below the wrist are considered contaminated during all surgical procedures.

6. Clean your fingernails with a file, discard it (in most situations you will drop the file into the sink and discard it later to prevent contamination by lowering your hands and/or touching a waste receptacle), and rinse your hands under the faucet without touching the faucet or the inside of the sink basin (Figure 2).

7. Allow the water to run over your hands from the fingertips to the elbows without moving the arm back and forth under the water.
   PURPOSE: Water running from the elbow down to the hands can carry bacteria back onto the hands.

8. Apply surgical soap from the dispenser to the sterile brush (or use a prepared disposable brush) and start the scrub by scrubbing the palm of the hand in a circular fashion.

9. Continue from the palm to the base of the thumb, then move on to the other fingers, scrubbing from the base, along each side, and across the nail, holding the fingertips upward and remembering to rub between the fingers (Figure 3). After the fingers have been completely scrubbed, clean the posterior surface of the hand in a circular fashion and then proceed to the wrist. The scrub process should take at least 5 minutes for each hand and arm.
   PURPOSE: The surfaces of the fingers have four sides.

10. Do not return to a clean area after you have moved to the next part of the hand.
    PURPOSE: Once an area has been scrubbed, it is considered surgically clean, and rubbing that area again contaminates it.

11. Wash the wrists and forearms in a circular fashion around the arm while holding your hands above waist level (Figure 4).

12. Rinse the arms and forearms from the fingertips upward, holding the fingers up, without touching the faucet or the inside of the sink basin (Figure 5).
    PURPOSE: Keep the fingers higher than the rest of the arm to prevent contamination from water running downward from the elbow. Touching the dirty faucet and/or basin causes contamination.

13. Apply more solution without touching any dirty surface and repeat the scrub on the other side, remembering to wash and use friction between each finger with a firm, circular motion.

14. Scrub all surfaces, being careful not to abrade your skin. The second hand and arm should take at least 5 minutes.

Figure 1
Figure 2
Figure 3
15. Rinse thoroughly, keeping your hands up and above waist level. Discard the scrub brush without lowering the arms below the waist (Figures 6 and 7).

16. Turn off the faucet with the foot, knee, or forearm lever, if available. 
**PURPOSE:** To prevent clean hands from touching the contaminated faucet handles.

17. Dry your hands with a sterile towel, being careful to keep the fingers pointing upward and your hands above the waist. Do not rub back and forth, dragging contaminants from the dirtier area of the upper arm down toward the hands (Figures 8 and 9). Use the opposite end of the towel for the other hand.
**PURPOSE:** To keep your clean hands from touching the part of the towel that comes in contact with your forearms, which are not as clean as your hands. If you are to gown and glove for a procedure, you must use a sterile towel.

18. Using a patting motion, continue to dry the forearms. Discard the towel and keep your hands up and above waist level (Figure 10).
PROCEDURE 57-5

Assist the Physician with Patient Care: Open a Sterile Pack and Create a Sterile Field

GOAL: To open a sterile instrument pack using correct aseptic technique.

EQUIPMENT and SUPPLIES
- A sterile instrument pack, wrapped with either muslin or autoclave paper that, when opened, will serve as a sterile table drape or field
- Mayo stand or countertop
- Disinfectant and gauze sponges

PROCEDURAL STEPS
1. Check that the Mayo stand or countertop is dust-free and clean. If it is not, clean with 70% alcohol or another disinfectant and dry carefully. PURPOSE: Although some areas cannot be sterile, steps must be taken to keep contamination to a minimum; moisture on a tray contaminates the pack.
2. Sanitize your hands and make sure they are completely dry. If you will be assisting with a surgical procedure immediately after opening the sterile pack, perform the surgical hand scrub as explained in Procedure 57-4. PURPOSE: To reduce the number of transient and resident bacteria on your hands and forearms; moisture on your hands contaminates the pack.
3. Place the sterile pack on the Mayo stand or countertop and read the label. PURPOSE: Take care to open the required pack. Most medical offices have a limited supply of autoclaved packs. Opening a wrong package could mean not having enough sterile supplies for a different procedure.
4. Check the expiration date. If using an autoclaved pack, check the indicator tape for a color change. PURPOSE: An expired pack is not considered sterile. Autoclave indicator tape changes color after the sterile processing cycle.
5. Open the outside cover (Figure 1). Position the package so that the outer envelope flap is at the top and facing you.

PURPOSE: This positions the pack for correct opening so that you do not have to cross over the sterile pack to open it.
6. Open the outermost flap (Figure 2). Next, open the first flap away from you. Do not cross over the pack.
7. Open the second corner, pulling to side (Figure 3). PURPOSE: To prevent contamination of the sterile field.
8. Be careful to lift the flaps by touching only the small, folded-back tab and without touching or crossing over the inner surface of the pack or its contents. Open the remaining two corners of the pack. (Figure 4).
9. You now have a sterile drape as a sterile field from which to work and for the distribution of additional sterile supplies and instruments (Figure 5).
PROCEDURE 57-6

Assist the Physician with Patient Care: Use Transfer Forceps

GOAL: To move sterile items on a sterile field or transfer sterile items to a gloved team member.

EQUIPMENT and SUPPLIES
- Sterile item to move or transfer
- Sterile wrapped transfer forceps
- Mayo stand setup with a sterile field and sterile instruments

PROCEDURAL STEPS
1. Sanitize your hands, making sure they are completely dry. If you will be assisting with a surgical procedure immediately after this procedure, perform the surgical hand scrub as explained in Procedure 57-4.
   PURPOSE: To reduce the number of transient and resident bacteria on your hands and forearms; moisture on your hands contaminates the pack.
2. Open a package containing sterile transfer forceps (Figure 1).
PROCEDURE 57-6—cont'd

3. Using sterile technique, handle the sterile forceps by the ring handle only. Always point the forceps tips down. 

PURPOSE: If the tips are turned upward, any solution encountered will run onto the nonsterile area, and then back down over the sterile end when the tips are turned down again, thus contaminating the forceps.

4. Grasp an item on the sterile field with the sterile forceps, points down, and move it to its proper position for the procedure, making sure not to cross the sterile field with the hand or contaminated end of the forceps (Figure 2).

5. Alternatively, transfer an instrument from the autoclave to the sterile field.

6. Remove the transfer forceps after one-time use.

FIGURE 2

PROCEDURE 57-7

Assist the Physician with Patient Care: Pour a Sterile Solution onto a Sterile Field

GOAL: To pour a sterile solution into a sterile stainless steel bowl or container sitting at the edge of a sterile field.

EQUIPMENT and SUPPLIES

- Bottle of sterile solution
- Sterile bowl or container
- Sterile field
- Sink or waste receptacle

NOTE: The sterile bowl should be placed, using sterile transfer forceps, near one edge of the field and the perimeter of the 1-inch barrier.

PROCEDURAL STEPS

5. Pour away from the label (Figure 1).

PURPOSE: Spills down the side of the bottle can stain the label or make it unreadable.

6. If the container does not have a double cap, before pouring the solution into the sterile container, pour off a small amount of the solution into a waste receptacle.

PURPOSE: To rinse any contaminants off the bottle lip.

FIGURE 1
PROCEDURE 57-7 — cont’d

7. Pour away from the label, into the bowl, without allowing any part of the bottle to touch the bowl and without crossing over the sterile field (Figure 2).
   PURPOSE: The bottle exterior is not sterile.

8. Tilt the bottle up to stop the pouring while it is still over the bowl.
   PURPOSE: Solutions spilled on the sterile field may contaminate the field.

9. Replace the cap (or caps) off to the side, away from the sterile field, being careful not to touch and therefore contaminate the internal surface of the lid.

PROCEDURE 57-8

Assist the Physician with Patient Care: Put on Sterile Gloves

GOAL: To put on sterile gloves correctly before performing sterile procedures.

EQUIPMENT and SUPPLIES
- Pair of packaged sterile gloves in your size

PROCEDURAL STEPS

1. Perform the surgical hand scrub as explained in Procedure 57-4 before putting on sterile gloves.

2. Open the glove pack, being careful not to cross over the open area in the middle of the pack. Remember, a 1-inch area around the perimeter of the glove wrapper is considered not sterile.
   PURPOSE: The open glove pack is a sterile field.

3. Glove your dominant hand first.
   PURPOSE: This sets up your dominant hand to do the more difficult step, which is to put on the second glove.

4. With your nondominant hand, pick up the glove for your dominant hand with your thumb and forefinger, grabbing the top of the folded cuff, which is the inside of the glove, being careful not to cross over the other sterile glove (Figure 1).
   PURPOSE: The inside of the glove will be next to your skin and is considered not sterile.

5. Lift the glove up and away from the sterile package.
   PURPOSE: To prevent accidental contamination from touching the glove on the 1-inch area around the perimeter of the glove wrapper.

6. Hold your hands up and away from your body and slide the dominant hand into the glove (Figure 2).

7. Leave the cuff folded (Figure 3).
   PURPOSE: You will unfold the cuff later.
8. With your gloved dominant hand, pick up the second glove by slipping your gloved fingers under the cuff, extending the thumb up and away from the glove, so that your gloved fingers touch only the outside of the second glove (Figure 4).

PURPOSE: Sterile surfaces must always touch sterile surfaces.

9. Slide your nondominant hand into the glove without touching the exterior of the glove or any part of the gloved hand (Figures 5 and 6).

10. Still holding your hands away from you, unroll the cuff by slipping the fingers into the cuff and gently pulling up and out. Do not touch your bare arm or the internal surface of the glove with any part of the sterile glove (Figure 7).

11. Now, slip your gloved fingers up under the first cuff and unroll it, using the same technique (Figure 8).
over the shoulders and forward gives off a cloud of bacteria with every movement. It must always be secured back and up, not touching the shoulders.

### Rules for Maintaining a Sterile Field

- Talking should be kept to a minimum because air currents carry bacteria.
- Sterile team members should always face one another.
- Always keep the sterile field in your view. If you turn your back on a sterile field or lose sight of it, it is considered contaminated.
- Nonsterile persons or items should never cross over the sterile field.
- Tables are sterile only at table level; anything that falls below the edge of the Mayo tray is considered contaminated. A 1-inch border surrounding the tray is considered contaminated, so anything placed on the tray within that 1-inch border is contaminated.
- Consider a sterile barrier contaminated if it has been wet, cut, or torn.
- Packages placed on a clean surface are contaminated on the outside, but the inside of the sterilized package may be used as a sterile field.
- Keep sterile gloved hands above waist level at all times; do not let hands drop below the waist.
- Never remove and then replace any item in the field (e.g., using sterile forceps to cleanse a wound), or the field is contaminated.
- The inside of a sterile package remains so if the package is peeled open properly, it should be opened in the entire way, and the contents then tossed onto the field without crossing over the sterile area.
- If a sterile package falls to the floor, it must be discarded.
- If you are in doubt about the sterility of anything, consider it contaminated.

### Assisting the Physician during Surgery

The physician ultimately is responsible for the patient; however, the medical assistant is responsible for ensuring that everything the assistant and the physician will use in caring for the surgical patient is accounted for, ready for use, and prepared in a safe and sterile manner (Procedure 57-9). Every team has preferences about the sequence they follow during routine minor surgery. Once a routine has been established, it should be followed in every case. Sample setups for various types of minor surgery are provided in Table 57-3.

The medical assistant sorts and places the scalpels, hemostats, scissors, tissue forceps, and retractors on the sterile field according to their sequence and frequency of use (Figure 57-6). Scalpels and sharp instruments should be conspicuously placed so that they do not accidentally injure a team member. The physician enters the room after scrubbing and then puts on gloves. The physician drapes the patient with towels or a fenestrated drape as the medical assistant hands the drapes, one at a time. Once the site has been draped, the Mayo stand with the sterile field is positioned below the site, and the medical assistant stands opposite the physician over the patient, ready to help as needed.

### Passing Instruments

During a procedure, the medical assistant must protect the sterile field from contamination. Notify the physician if a break in sterile technique occurs, dispose of soiled sponges into the biohazardous waste container, and anticipate the surgeon’s need for instruments. The physician may request instruments or may use hand signals (Figure 57-7). As the team works together over time, the physician may not need to give any signals, because the assistant will be able to anticipate the instrument needed next during the procedure.

Instrumentation is logical; if the physician requests a suture, scissors will be needed next to cut the suture strand. In the case of sudden hemorrhage from a bleeding vessel, the physician will need an appropriately sized hemostat. While gaining experience, the assistant watches, listens, and learns to judge what will be needed or performed next. Pass instruments with a firm, purposeful motion so that the physician does not have to look up. Wait until you feel the physician grasp the instrument so that it does not drop onto the patient or the floor and be careful that you and the physician are protected from injury. Pass the scalpel with the blade down and present the handle to the surgeon. Hold all instruments by their tips and pass the handle ends into the physician’s palm or fingers.

### Critical Thinking Application 57-6

In passing the scalpel to the surgeon while assisting with an I&D, Melissa feels the blade “slice” through her glove. She quickly and secretly looks at it and notices a “very tiny” nick in her glove. Because this is a “dirty” procedure, she decides to say nothing and continues assisting with the procedure. Is her reasoning sound here? What is the best approach to handling this situation? Why?

### Specimen Collection

If a specimen is collected during a procedure, it is placed in a sterile glass or basin. Do not remove the specimen from the sterile field until the physician gives the order. The surgeon may want to examine the specimen again during the surgery. After the procedure is complete, place the specimen in an appropriate container, label it, and send it to the laboratory for analysis.
PROCEDEAL 57-9

Assist the Physician with Patient Care: Assist with Minor Surgery

GOAL: To maintain the sterile field and to pass instruments in a prescribed sequence during a surgical procedure that involves the making of a surgical incision and the removal of a growth.

EQUIPMENT and SUPPLIES

- Open patient drape pack on the side counter
- Mayo stand covered with a sterile drape
- Packaged sterile gloves (two pairs)
- Needle and syringe for anesthesia medication
- Vial of local anesthetic medication
- Sterile drape
- Disposable scalpel with No. 15 blade
- Allis tissue forceps
- Skin retractor
- Three hemostats
- Supply of sterile gauze sponges
- Biohazardous waste receptacle
- Sharps container
- Needle with suture material
- Specimen cup
- Laboratory requisitions
- Patient’s record

PROCEDURAL STEPS

1. Prep the patient’s skin with surgical soap and antiseptic solution as explained in Procedure 57-3. Explain the prep procedure to the patient. PURPOSE: To ensure infection control and to demonstrate awareness of possible patient concerns.

2. Perform the surgical hand scrub as explained in Procedure 57-4.

3. Set up the sterile field with instruments and supplies, in the sequence to be used (Figure 1). If it is necessary to touch sterile supplies, put on sterile gloves (see Procedure 57-8) or use sterile transfer forceps (see Procedure 57-6). After the sterile field has been set up, cover it with a sterile drape.

4. Position the Mayo stand near the patient and the operative site, making sure the patient understands not to touch the sterile field (Figure 2).

   PURPOSE: To prevent contamination of supplies and provide easy access for the physician.

5. Put on sterile gloves using aseptic technique.

6. Grasp the patient drape by holding one edge or corner in each hand (Figure 3).

7. Drape the surgical site without touching any part of the patient or the operating area with your gloved hands (Figure 4).

8. If the physician requests medication, such as a local anesthetic, a second circulating assistant holds the vial of local anesthetic so that the physician can read the label. The physician withdraws the desired amount using sterile technique (Figure 5).

   PURPOSE: The vial of local anesthetic medication must be held by the second assistant away from the sterile field to prevent crossing over the sterile area.
PROCEDURE 57-9—cont’d

9. The surgeon injects the local anesthetic and waits a few minutes for it to take effect.
10. Position yourself across from the surgeon. Arrange the sterile field.
11. Place two sponges on the patient next to the wound site (Figure 7).
12. Keep all sharp equipment conspicuously placed on the sterile field.

PURPOSE: Sharp instruments that are not clearly visible may injure a team member.

13. Pass the scalpel, blade down and handle first, to the surgeon, or the surgeon will reach for it himself or herself. The surgeon will take the scalpel with the thumb and forefinger in the position ready for use (Figure 8).

PURPOSE: To protect the surgeon and yourself from injury.

14. Grasp on Allis tissue forceps by the tips and pass it to the surgeon to grasp a piece of the tissue to be excised (Figure 9).
15. Pass the handles into the surgeon’s open palm with a firm, purposeful motion. A gentle “snap” is heard as it comes in contact with the surgeon’s gloved hand.

PURPOSE: The surgeon will not have to look up to receive the instrument.

16. Dispose of soiled sponges in the biohazardous waste receptacle, being careful to keep your hands above your waist and to avoid touching any nonsterile items.

17. Hold clean sponges in your hand to pat or sponge the wound as needed (Figure 10).

18. Safely position the specimen (if any) where it will not be disturbed on the sterile field (Figure 11).

19. If there is a bleeding vessel or if a hemostat is requested, pass the hemostat in the manner described in steps 14 and 15.
20. Continue to sponge blood from the wound site.
21. Retract the wound edge, as needed, with a skin retractor.
22. Continue to monitor the sterile field and assist the surgeon as needed.
23. Pass the needle and suture material to close the wound and apply a sterile dressing as requested (Figure 12).
24. Monitor the patient and provide assistance as needed.
25. When the physician is finished, clean the area using aseptic technique.
26. Collect the specimen, place it in a labeled specimen cup, and send it to the laboratory with the proper requisitions.
27. Document the procedure, wound condition, and patient education on wound care.
Completing the Surgical Procedure

At the conclusion of the procedure, the physician begins wound closure (Procedure 57-10). The techniques and methods of tissue closure vary greatly; all of them cannot be described or illustrated here. The two basic methods of suturing are the continuous running suture and the interrupted suture, in which each knot is placed and tied one at a time, so that if one breaks, the others keep the wound closure intact (Figure 57-8). The interrupted technique is used for most skin closures in a medical office.

The physician may prefer that the medical assistant place the needle in a needle holder and pass it, handle first. As the physician closes the wound, you may assist by cutting the suture and sponging the site. The physician places the first interrupted suture at the midpoint of the incision. Then each side of the first suture is mentally divided in half again, and the next two sutures are placed at each of these midpoints. The rest of the sutures are placed using the same technique until the wound edges have been completely approximated. The physician may also opt to close a wound with surgical staples.

After the skin closure, the wound site is cleansed with wet (using sterile, normal saline solution) and sterile dry sponges by the surgeon or the assistant. Care must be taken not to disturb the wound edges or sutures. Next, a sterile dressing is placed over the incision (Procedure 57-11), and a bandage is applied to support the dressing.

Postoperative Responsibilities

After caring for the patient, the medical assistant clears the sterile field, following Standard Precautions. Wear disposable gloves until all contaminated materials have been properly removed and handled. Place disposable equipment and supplies in biohazardous waste containers and/or sharps containers. The room should be checked for any blood spills or other contamination and disinfected appropriately. After completing this process, remove the contaminated gloves and sanitize your hands.

Use clean gloves to disinfect the room, including the table, Mayo stand, side and back tables, any other equipment in the room, and the floor. Used instruments must be sanitized, disinfected, and resterilized for future use. The surgeon and medical
**TABLE 57-3 Setups for Minor Surgeries**

<table>
<thead>
<tr>
<th>PROCEDURE</th>
<th>SIDE COUNTER</th>
<th>STERILE FIELD</th>
<th>COMMENTS</th>
<th>POSTOPERATIVE CARE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suture repair</td>
<td>Local anesthetic, dressings and bandages, splints or gauze, tape, drape, gloves, sterile normal saline solution</td>
<td>Syringe and needle, heparin (three), scissors, sponges, suture material and needle, tissue forceps or skin hook, needle holder</td>
<td>If a patient arrives with a pressure dressing over a laceration, follow standard precautions. Do not remove the pressure dressing until the physician is ready to suture. If the patient’s pressure cloth must be removed, have ample sterile dressings ready to apply immediately. Ask the patient the approximate length, depth, and exact location of the laceration. Follow the physician’s directions regarding cleansing of the wound.</td>
<td>Clean lacerations in a moderately protected area may not require a dressing. The patient is instructed to keep the area clean and dry. Some lacerations may be closed with Steri-Strips or an adhesive bandage.</td>
</tr>
<tr>
<td>Needle biopsy</td>
<td>Specimen container with prepackaged fixative or preserving solution, laboratory form and label, local anesthetic, gloves</td>
<td>Biopsy needle, syringe and needle, sponges</td>
<td>A biopsy is the examination of tissue removed from the living body. Biopsies usually are done to determine whether a growth is malignant or benign; however, a biopsy may be done as a diagnostic aid in other diseases or infections. A needle biopsy may be done by aspiration with a needle and syringe or with a special biopsy needle. The specimen then is sent to a pathologist for either a cytologic or histologic examination.</td>
<td>Usually no special dressing is required after a needle biopsy. An adhesive bandage strip (e.g., Band-Aid) often is sufficient.</td>
</tr>
<tr>
<td>Cyst removal</td>
<td>Local anesthetic, disinfectant (skin prep.), laboratory form, dressing (size depends on site), gloves, drape, specimen container with prepackaged fixative or preserving solution</td>
<td>Kelly hemostats (two straight and two curved), dressing forceps (two), suture and needle, scissors, dissector (physician’s choice), skin hook, syringe and needle, disposable scalpel No. 11 or No. 15 blade, tissue forceps (two), Allis forceps, needle holder, sponges</td>
<td>A sebaceous cyst is a benign retention cyst of a sebaceous gland containing fatty substance from the gland. The cyst is attached to the skin and moves freely over the underlying tissue. For cosmetic reasons the physician makes the incision on the natural skin crease lines if possible.</td>
<td>See suture repair, above, or apply a small sterile dressing, depending on the size of the incision.</td>
</tr>
</tbody>
</table>

**SINGLE-ASSISTANT PREPARATION FOR MINOR SURGERY**

1. Sanitize your hands and gather all supplies.
   - Sterile side (Mayo tray): Two towel packs, skin prep pack, patient drape pack, instrument pack, miscellaneous pack or packs, three glove packs, masks, gogles, aprons or gowns
   - Nonsterile side (side counter): Syringes, suture material, anesthesia solutions, additional sponges, dressings, bandages, transfer forceps, waste basin, waste receptacle, nonsterile gloves, masks, gogles, aprons or gowns
2. Escort the patient into the room.
3. Greet and converse with the patient.
4. Position the patient on the table.
5. Sanitize your hands.
6. Open the first towel pack.
7. Open the skin prep pack.
8. Pour soap and antiseptic solutions.
9. Expose the site to be prepared.
10. Glove and arrange prep items within the sterile field.
11. Place sterile towels at skin scrub boundaries using sterile technique.
12. Prep the patient’s skin.
14. Discard gloves; wash your hands, following the guidelines for a surgical hand scrub (Procedure 57-4) if this procedure is part of the policy of the attending physician or the facility.
15. Open the table drape pack on the Mayo stand to create the sterile field.
16. Open the instrument pack or packs and transfer the instruments to the sterile field. Add the sterile syringe unit.
17. Add sterile items as requested.

18. The physician joins you and converses with the patient.
19. Open the physician's glove pack (the physician now puts on gloves).
20. Open the patient drape pack (the physician now drapes the surgical site).
21. Cleanse and hold up the anesthesia vial for the physician to withdraw anesthesia with the sterile syringe (the physician now administers the anesthesia).
22. Repeat the surgical hand wash; reglove with a new glove pack.
23. Arrange the sterile field instruments and other materials for safety and in sequence; check the condition of each instrument.
24. Open the suture/needle pack per the physician’s choice; load the first suture into the needle holder.
25. Place two gauze sponges at the site.
26. Assist with the procedure.*
   • For the physician: Pass the instruments; maintain the field; anticipate his or her needs; and cut sutures.

- For the patient: Retract tissue; sponge blood from the wound; apply the bandage; and care for the specimen.
27. Escort the patient to the recovery area and check vital signs as instructed.
28. Record and prepare specimens.
29. Clean the room; clear materials and discard in biohazardous waste containers.
30. Chart the procedure in the patient's medical record.
31. Help the patient prepare to leave the office.
32. Sanitize, disinfect, and sterilize the equipment at the first available time.

*By law, the assistant may not clamp tissues, place sutures, or alter body tissues in any way.

Postoperative Instructions and Care
The patient should be given time to rest after the surgery. If a sedative was administered, make sure the patient has recovered
PROCEDURE 57-10

Assist the Physician with Patient Care: Assist with Suturing

GOAL: To assist the surgeon in wound closure, using sterile technique.

EQUIPMENT and SUPPLIES
- Sterile field on Mayo stand
- Surgical scissors
- Suture material
- Sterile gloves
- Needle holder
- Sterile gauze sponges
- Biohazard sharps container and waste receptacle
- Patient record

NOTE: This procedure may be a continuation of Procedure 57-11. If done independently, you must perform the surgical scrub and glove before beginning step 1.

PROCEDURAL STEPS

1. Hold the curved needle point in your minor hand, 4 to 5 inches over the sterile field (Figure 1).
   PURPOSE: Always work over a sterile field and take care not to puncture gloves with the sharp needle.

2. With the needle holder, clamp the suture needle at the upper third of its total length (Figure 2).
   PURPOSE: Clamping in the middle weakens and may distort the shape of the needle. Clamping too near the thread may cause the suture to detach from the needle. Clamping at the tip of the needle damages the needle point.

3. With your dominant hand, hold the needle holder halfway down its shaft with the suture needle point up.

4. With your nondominant hand, hold the suture strand, and pass the needle holder into the surgeon's hand (Figures 3 and 4).

5. Pick up the surgical scissors with your dominant hand and a gauze sponge with your nondominant hand.

6. After the surgeon places a closure suture, knots it, and holds the two strands taut, cut both suture strands in one motion. Cut between the knot and the surgeon, at the length requested, approximately 1/4 inch.

7. Gently blot the closure once with the gauze sponge in your nondominant hand.
   PURPOSE: Rubbing or friction may damage the wound edges.

8. If additional strands of suture are needed, repeat the process.
Assist the Physician with Patient Care: Apply or Change a Sterile Dressing

**GOAL:** To apply a sterile dressing properly at the completion of a surgical procedure.

**EQUIPMENT and SUPPLIES**
- Sterile dressing material or Telfa
- Sterile gloves
- Patient’s record

**PROCEDURAL STEPS**

1. After surgery is complete, before the sterile drape is removed and while you are still wearing sterile gloves, pick up the dressing from the sterile field, place it on the wound, and hold it there.
   **PURPOSE:** To prevent the introduction of microorganisms into the wound area.

2. Then remove the drape, switching hands to hold the dressing in place.
   **PURPOSE:** To keep the wound as clean as possible.

3. Secure the dressing with paper tape and/or an appropriate bandage.
   **PURPOSE:** To keep the wound covered and protected.

   **PURPOSE:** A procedure is not completed until it is recorded.

**FIGURE 57-8** A, Continuous (running) suture placement. B, Interrupted suture placement.

**Warning Signs**

Explain to the patient the importance of calling the office if any questions arise or changes occur that cause the person concern. If the patient does not call within the next 24 hours, you should call the patient. Many patients tend to “ride it out” or say they did not want to disturb you. Never allow the postoperative patient to leave the office without the physician’s knowledge and approval. Tell the patient to call the office immediately if he or she notes redness around the operative site, bleeding from the wound, fever, swelling, or increasing or severe pain. The wound should be kept clean and dry, and the patient should be taught how to change the dressing if needed.

**Follow-Up**

If the healing process is a long one or if the wound becomes infected, the patient may return for follow-up care. If the wound requires a new dressing, follow Standard Precautions; wear gloves and other protective barriers as appropriate. If at any time you determine that the wound may be infected, stop and have the physician examine it. Generally, no bandaging material should be reused, including Ace wraps. Tape applied directly to a patient’s
skin is not a good dressing immobilizer. If tape is used, always keep it to a minimum. If tape is holding a dressing in place, always remove it by pulling toward the wound. If it is adhering to a hairy area of the body, lift the outer tape edge with one hand and swiftly and gently separate the underlying hair and skin from the tape with the thumb of your other hand. Peel the skin from the bandage, not the bandage from the skin. Never rapidly "rip" tape from the body, because this may injure the skin. If the tape is not irritating to the patient, it may be advisable to leave the tape in place until total healing has taken place. If the wound has healed, the physician may ask the medical assistant to remove the patient’s sutures. If the physician closed the wound with surgical staples, the patient must return to the facility to have the staples removed (Procedure 57-12).

WOUND CARE

A wound can be intentional (i.e., from a surgical incision) or accidental, and it may be open or closed (Figure 57-10). An open wound has an outward opening where the skin is broken, exposing the underlying tissues. A closed or nonpenetrating wound does not have an outward opening, but the underlying tissues are damaged, as in a hematoma, contusion, or bruise. Closed wounds usually are the result of some type of blunt trauma to the body. An aseptic (clean) wound is not infected with pathogens. Septic wounds are infected with pathogens.

Open wounds may be classified according to the appearance of their openings. An incised wound has a clear edge and is made with a cutting instrument. An incised wound may be the result of surgery, an accident, or a knife wound. A lacerated wound has torn or mangled tissues and is made by a dull or blunt instrument. A penetrating or puncture wound is caused by a sharp, slender object, such as a needle or ice pick, and passes through the skin into the underlying tissues. A perforated wound is a penetrating wound that passes through a body organ or cavity, such as a gunshot wound.

Wound Healing

All wounds go through a healing or repair process that has three phases. The lag phase occurs first, when the blood vessels contract to control hemorrhage, and blood platelets form a network in the wound that acts as a glue to plug the wound. After a cascade of chemical reactions, fibrin is released into the wound and clotting begins. Fibrin continues to collect red blood cells (RBCs), and the clot dries into a scab. About 12 hours later, special white blood cells (WBCs), macrophages, arrive to clear away bacteria and dead tissue. Within 1 to 4 days the fibrin threads contract and pull the edges of the wound together under the scab.

The second phase, proliferation, is the wound healing and new growth period, which lasts 5 to 20 days. During this phase, the tissues repair themselves. New cells form, and the wound continues to contract and seal. If the wound is a clean surgical incision, complete contraction usually takes place and a cicatrix forms.

The final phase, the remodeling phase, extends from day 21 onward. Clean, shallow wounds may contract in the first two stages; large or mangled wounds require the time and cellular activity of this third phase to build a bridge of new tissue to close the gap of the wound. The cells produce a fibrous protein substance called collagen (connective tissue) that gives the wounded tissues strength and forms scar tissue. Scar tissue is not true skin; it usually is very strong, but it lacks the elasticity of normal skin tissue. Scar tissue also is devoid of a normal blood supply and nerves.

Wounds are classified by the way they repair themselves. A clean, surgical wound that has been sutured closed and heals quickly without much scarring does so by first intention. Tissues that are severely damaged or purposely kept open or that fail to close are said to heal by granulation (healing from the bottom of the wound outward), which is called second intention.

Several factors influence the healing process. People who are young, in good general health, and have adequate nutrition heal more rapidly. Adequate protection and rest of the injured area also enhance the healing process. Destruction or reinjury during the second phase can delay healing and increase scarring. Wounds are susceptible to infection, because the normal skin barrier is broken. If debris is present in a wound as the result of the breakdown of various cellular components, this dead (necrotic) tissue acts as a culture medium for bacterial growth. Suppuration (pus)
PROCEDURE 57-12

Assist the Physician with Patient Care: Remove Sutures and Surgical Staples

GOAL: To remove sutures and/or surgical staples from a healed incision using sterile technique and without injuring the closed wound.

EQUIPMENT and SUPPLIES

- Sterile suture removal kit containing the following:
  - Suture removal scissors
  - Gauze sponges
  - Thumb dressing forceps
  - Steri-Strips or adhesive bandage strips (e.g., Band-Aids)
  - Skin antiseptic swabs (e.g., Betadine swabs)
  - Surgical staple remover with 4 x 4-inch gauze sponges
- Biohazardous waste container
- Sterile gloves
- Patient's record

PROCEDURAL STEPS

1. Assemble the necessary supplies.
2. Sanitize your hands, following Standard Precautions.
3. Explain the procedure to the patient and instruct the person to lie or sit still during the procedure.
   PURPOSE: To ensure cooperation during the procedure.
4. Position the patient comfortably and support the sutured area.
5. Place dry towels under the site.
6. Check the incision line to make sure the wound edges are approximated and there are no signs of infection, such as inflammation, edema, or drainage.
   PURPOSE: Sutures or staples should not be removed unless the site is completely healed with the wound edges together; infection at the site will interfere with the healing process; removing sutures or staples before the site is completely healed may result in wound dehiscence.
7. Put on disposable gloves. Using antiseptic swabs, cleanse the wound to remove exudate and destroy microorganisms around the sutures or staples. Clean the site from the inside out, starting at the top of the wound and working your way down. Use a new swab if the step must be repeated.
   PURPOSE: Dried exudate on sutures or staples may make removing them without traumatizing the wound more difficult. Cleansing the wound reduces the possibility of wound infection.
8. Open the suture or staple removal pack while maintaining the sterility of the contents.
9. Place a sterile gauze sponge next to the wound site.
   PURPOSE: To place the removed sutures or staples.
11. Remove the sutures or staples.

To Remove Sutures

1. Grasp the knot of the suture with the dressing forceps without pulling.
2. Cut the suture at skin level (Figure 1).
3. Lift, do not pull, the suture toward the incision and out with the dressing forceps (Figure 2).
4. Place the suture on the sterile gauze sponge and check that the entire suture strand has been removed.
   PURPOSE: Suture fragments left in a wound may cause irritation and/or infection and may prolong the healing process.
5. If any bleeding occurs, blot the area with a sterile gauze sponge before continuing.
6. Continue in the same manner until all sutures have been removed.

To Remove Staples

1. Gently place the bottom jaw of the staple remover (Figure 3) under the first staple.
2. Tightly squeeze the staple handles together.
(3) Carefully tilt the staple remover upward until the staple lifts out of the wound (Figure 4).

(4) Place the removed staple on a 4 x 4-inch gauze square.

(5) Continue the process until all staples have been removed.

12. Remove the gauze sponge with the sutures on it and dispose of contaminated materials in the biohazardous waste container.

13. The surgeon may apply or may have you apply Steri-Strips or an adhesive bandage strip for added support, strength, and protection.

14. The patient is instructed to keep the wound edges clean and dry and not to place excessive strain on the area.

15. Document the procedure, wound condition, number of sutures or staples removed, whether a dressing or bandage was applied, and the instructions on wound care given to the patient.

PURPOSE: A procedure that is not documented was not done.

**FIGURE 3**

contains necrotic tissue, bacteria, dead WBCs, and other products of tissue breakdown. Necrotic tissue must be removed; the removal of debris is called debridement, which may occur naturally or may be performed surgically.

Sometimes the physician may prefer no dressing or bandage on small wounds. This is called open wound healing. Some advantages to open wound healing are:

- Air can circulate freely around the wound.
- The wound is not irritated or rubbed by a dressing.
- The wound stays dry, which inhibits bacterial growth, reducing the chance of infection.
- Sutures stay dry and hold together better.
- Any pre-existing infection remains localized and is not spread by the dressing or bandage.

**Dressings**

A dressing is a sterile covering placed over a wound for the purposes of:

- Protecting the wound from injury and contamination
- Maintaining constant pressure to minimize bleeding and swelling
- Holding the wound edges together
- Absorbing drainage and secretions

A dressing usually consists of a strip of lubricated mesh gauze, a nonstick Telfa pad, or a clear dressing placed over a sutured wound (Figure 57-11). Gauze sponges may be placed over non-adhering material, depending on the physician’s preference. Body cavities or wounds that need to remain open for a time are dressed with long, thin packing material that often is impregnated with an antiseptic or a lubricant; this sometimes is called packing. A good dressing must be effective and comfortable and must remain in place. If the dressing covers a hairless area, it may be anchored with tape, but no tape should touch the wound.

Frequently, small, clean lacerations may be closed with Steri-Strips (Figure 57-12). These strips reduce the chance of infection and do not leave suture scars. Steri-Strips are used on areas of the body that are protected from movement and stress. They often are used on the face. Because they are a suture replacement, only the physician should place them on a fresh wound. However, if they are applied after suture removal to provide further support for healing tissues, the medical assistant may apply them. They are placed on the wound in the same sequence and at the same intervals as interrupted sutures and are left in place until they fall off or the wound heals.

**Bandages**

Bandages hold dressings in place and also help maintain even pressure, support the affected part, and help protect the wound from injury and contamination. Bandages can be gauze, cloth, or elastic cloth rolls and are bound by clips, tape, or ties. Dress-
ings and bandages frequently appear easy and simple to apply; however, special skill is required to use different types of bandaging techniques (Procedure 57-13). Bandages that are too loose fall off; those that are too tight may compromise circulation and further harm the patient.

Plain roller gauze is seldom used. It is difficult to handle, has no elasticity, and tends to bind. It also tends to slip, because it does not adhere to itself. Wrinkled crepe-type roller bandages (e.g., Kling) are preferred, because they easily conform to various shapes of the body and adhere to themselves (Figure 57-13, A). If the bandage is to cover a wound, it should always be applied over a sterile dressing.

Plain elastic cloth (e.g., Ace) bandages or elastic roller cloth with adhesive backing make flexible, secure covers (Figure 57-13, B). When an Ace elastic roller bandage is applied as a pressure bandage, especially to the lower limbs, it is essential to keep the bandage consistent in spacing and tension to ensure even pressure. Even, gentle pressure stimulates circulation and healing. Uneven pressure causes constriction points that can create pressure sores, ulcers, or edema. Roller bandages usually are applied from the distal to the proximal part of the area, because it is more even and snug if it is wrapped from a smaller to a larger circumference. Elevate the limb while you are bandaging and work with the roller facing upward, close to the patient’s skin. Elastic bandages are excellent for bandaging the hand and wrist (Figure 57-14) and the foot and ankle (Figure 57-15).

**CRITICAL THINKING APPLICATION 57-7**

Melissa applied a figure-eight elastic bandage to the hand and wrist of a patient who came into the office for suturing. She immediately sent the patient home after applying the bandage. She did not document the procedure in the patient’s medical record at that time because the office was quite busy. Discuss all of your concerns regarding this situation. In what ways were safe patient practices ignored? What would be the worst-case scenario for the outcome of this situation? How can this potentially serious situation be corrected after the fact?

---

**FIGURE 57-10** Types of wounds. A. Laceration—a jagged, irregular breaking or tearing of tissues, usually caused by blunt trauma. B. Puncture—piercing of the skin by a pointed object, such as a pin, nail, splinter, or bullet. C. Abrasion—a superficial wound made by scraping of the skin. D. Avulsion—tissue forcibly torn or separated, caused by accidents.
FIGURE 57-10, cont'd  
E, Surgical incision—a neat, clean cut. F, Hypodermic puncture—an injection under the skin. G, Contusion—a closed, nonpenetrating wound in which blood from broken vessels accumulates in tissue. H, Incision—a neat, clean cut from sharp objects, such as glass, knives, or metal.

FIGURE 57-11  
A, Placing a clear dressing on a sutured wound. B, Clear dressing in place over a sutured wound.
Seamless tubular gauze bandage, with or without elastic, is a superior material for covering round narrow surfaces such as fingers or toes. It can be used as a dressing if the gauze material is sterile or as a bandage. A tubular gauze bandage is applied with a cagelike applicator (Figure 57-16). Work with the open circle of the applicator toward the patient. Hold the applicator in the dominant hand and control the tension flow with your fingers as the applicator is gradually rotated and the material slides off. Tubular dressing may be applied with or without slight pressure. Beyond the tip of the bandaged part, give the applicator a full half-turn, place the applicator again over the part, and repeat the process, being careful not to create a tourniquet effect when you reverse the applicator. When the desired thickness of the bandage is reached, cut the gauze and anchor the final gauze application with tape or by tying at the wrist.

**PROBLEM 57-13**

**GOAL:** To apply an elastic bandage to the forearm.

**EQUIPMENT and SUPPLIES**

- One 3- or 4-inch elastic bandage with clip closures

**PROCEDURAL STEPS**

1. Choose the proper size bandage for the size of the arm you are bandaging.
   
   **PURPOSE:** To provide proper support for the area.

2. Sanitize your hands. Perform a circular turn at the starting point, securing a turned down corner of the bandage in the first circle around the site.
   
   **PURPOSE:** To anchor the bandage at the starting point.

3. Hold the roll so that the bandage can be rolled away from you (Figure 1).
   
   **PURPOSE:** To easily and securely apply the bandage.

4. Keep the roll close to the patient and keep it facing upward (Figure 2).
   With each successive turn, overlap the previous bandage turn by half.

5. Maintain even tension and spacing as you continue to apply the bandage up the forearm.
   
   **PURPOSE:** To maintain even, light pressure over the entire area.

6. When crossing a joint, slightly flex the joint (Figure 3).
   
   **PURPOSE:** To facilitate patient comfort and maintain normal circulation.

7. Fasten the end of the bandage with clips or tape (Figure 4).

8. Check the nail beds for cyanosis; ask the patient whether the bandage is comfortable or feels too tight.
   
   **PURPOSE:** To ensure that the bandage is not acting as a tourniquet if applied too tightly.

9. Check the radial pulse.
   
   **PURPOSE:** To ensure that the bandage is not acting as a tourniquet if applied too tightly.

10. Have the patient move the fingers.
    
    **PURPOSE:** To check that nerve function is normal.

11. Document the procedure in the patient's medical record; also document instructions given to the patient about bandage care and replacement.
    
    **PURPOSE:** The procedure is not completed until it is recorded, dated, and signed.
before meals; after sneezing, coughing, or nose blowing; after using the bathroom; before and after changing a dressing or bandage; and after changing an infant’s diaper.

- Instruct the patient about the differences between sterile and clean dressings and bandages. Show the person step by step how to change a dressing properly and then how to dispose of the contaminated items.

A medical assistant’s duty may include calling the patient the day before surgery to confirm the scheduled surgical procedure and appointment time. Explaining the procedure and what to expect during and after surgery prepares the patient and helps calm the person’s fears or concerns. Lying still during surgery is important, and eating a light meal the night before should be encouraged. Bathing before coming to the office helps reduce the number of bacteria on the skin, and comfortable, loose clothing should be worn. Sometimes in the course of general conversation the medical assistant can pick up hints of concerns the patient may have and can direct the conversation into a discussion of these concerns.

Patients should be informed that they may need someone to accompany them home. A bandage is applied after surgery, and it must be kept clean and dry. The patient may have some pain,
and the physician probably will prescribe some type of analgesic. After the procedure is complete, make sure the patient makes an appointment for a return visit and examination. Patients should also be encouraged to call the office immediately if they suspect an infection or have a sudden increase in pain at the surgical site.

**Legal and Ethical Issues**

Many minor surgical procedures previously performed in the hospital are now being done in a medical office, surgery center, or clinic. As insurance companies continue to recognize the cost-effectiveness of performing minor surgical procedures in these settings, the role of the medical assistant continues to expand.

Personal discipline is the primary concern in surgical asepsis. Often the assistant is alone when performing a surgical aseptic procedure; if contamination occurs, no one may know except the medical assistant. It is the surgical assistant’s responsibility to begin the procedure again with clean or sterile supplies if it is possible that contamination occurred. The medical assistant’s
main responsibilities include carrying out sanitization, disinfection, and sterilization procedures with precision and with total effectiveness. There is no room for compromise.

Patients should have absolute assurance that they are being taken care of in an aseptic atmosphere and under the most stringent aseptic conditions. This assurance is just as important for the protection of the office staff as it is for the patient. Allowing the physician to assume that the correct aseptic techniques have been used in the preparation of equipment and allowing him or her to use contaminated equipment on a patient can result in claims of malpractice and charges of battery. Absolute, uncompromising honesty on the part of the assistant builds self-respect and contributes to professional achievement and satisfaction.

To have a good understanding of the subject, you must become familiar with the various techniques of sanitization, disinfection, and sterilization. Ignorance or carelessness can be dangerous and is inexcusable before the law.

The medical assistant must know what procedure is scheduled and whether the patient has been informed about the procedure. In the surgical setting, the medical assistant must realize the full extent of his or her role as the patient's advocate and the physician's agent.

Confirm that the physician has explained the procedure to the patient and that the patient fully understands all aspects of the procedure to be performed. This means that when the patient signs the consent for surgery, he or she is fully informed. Legal action can result if complications arise because of failure to complete consent forms. The surgical procedure is expedited when the patient is given instructions and knows what to expect. Increasing the patient's understanding ensures greater compliance with presurgical preparations, and the patient is more likely to follow instructions and advice after surgery.

The medical assistant must practice perfect aseptic technique. A break in technique may invite infection and possible legal action. It is the medical assistant's duty to protect the patient. A major responsibility of the medical assistant is to adhere strictly to aseptic technique and to correct immediately any break in technique.

**Summary of Scenario**

Melissa is finding her clinical medical assisting position in Dr. Armstrong's practice rewarding, exciting, and challenging. She enjoys coming to work every day and has learned all aspects of her position much more quickly than most of her peers. Melissa frequently reads the latest information on new developments in minor surgery practice. Her concern for her patient's well-being makes her stand out, and the physician constantly gets positive comments on her level of professionalism.

Melissa has made a few errors in sterile technique since starting the clinical assistant position, but she has learned from each situation and has never covered up a mistake. Whenever she realized that she did not follow procedure, she has discussed the issue with her supervisor and with Dr. Armstrong. In this way, errors can be corrected, if possible, and she most likely will not make the same or similar mistakes again.

Melissa is a team player who consistently tries to anticipate the needs of the physician and patient both before and during surgery. Her cooperative, supportive manner is appreciated by everyone on the clinical staff.
SUMMARY OF LEARNING OBJECTIVES

1. Define, spell, and pronounce the terms listed in the vocabulary.
   Spelling and pronouncing medical terms correctly bolster the medical assistant's credibility. Knowing the definitions of these terms promotes confidence in communication with patients and co-workers.

2. Apply critical thinking skills in performing the patient assessment and patient care.
   Completing the Critical Thinking Application exercises throughout the chapter can help the student medical assistant become more adept at critical analysis of real-life situations.

3. Define the concepts of aseptic technique.
   Medical asepsis is the process of reducing the number of pathogens or destroying all pathogens; surgical asepsis is the complete destruction of all organisms or instruments or equipment that will enter the patient's body. Using proper surgical aseptic techniques is the primary means of preventing postoperative infections in surgical patients. Everyone on the surgical team is responsible for preventing and correcting breaks in technique.

4. Explain the differences among sanitization, disinfection, and sterilization.
   Sanitization is the cleaning of instruments and the environment to reduce the number of pathogens. Disinfection is the destruction of pathogens by physical or chemical means. Sterilization is the destruction of all microorganisms.

5. Summarize tips for improving autoclave techniques.
   Refer to Table 57-2.

6. Demonstrate how to wrap instrument packs for autoclave sterilization.
   Refer to Procedure 57-1.

7. Explain the types and uses of sterilization indicators.
   Autoclave tape contains a chemical dye that changes color when exposed to steam. Biologic sterilization indicators include a spore strip indicator, which contains a temperature-sensitive dye that changes color when the proper combination of steam, temperature, and time has been achieved. An indicator strip should be placed in the center of the largest pack.

8. Summarize the correct methods of loading, operating, and unloading an autoclave.
   The load is arranged for maximum circulation of steam and heat. Articles should be resting on edges; jars and bottles should be placed on their sides. When the cycle is complete, the pressure is released according to the manufacturer's guidelines. The medical assistant stands back from the door and, with heat-resistant gloves, opens the door approximately 1/2 inch. The load is allowed to dry for at least 15 minutes before removal.

9. Demonstrate how to operate an autoclave.
   Refer to Procedure 57-2.

10. Summarize common minor surgical procedures.
    Typical minor surgical procedures include I&D of a cyst; electrosurgery, which uses high-frequency current to cut through tissue and coagulate blood vessels; laser surgery, which uses tiny light beams to safely treat specific tissues with minimal damage to surrounding tissues and to limit scar formation; microsurgery, which involves the use of an operating microscope to perform delicate surgical procedures; endoscopic procedures, which use a fiberoptic instrument with a miniature camera mounted on a flexible tube to examine the area within an organ or cavity and which are named according to the organs or cavity explored; and cryosurgery, which is the use of extreme cold to destroy tissues such as warts and skin lesions.

11. Detail the medical assistant's role in minor office surgery.
    The medical assistant is responsible for preparing the patient for surgery; performing the physician's preoperative orders; confirming that the patient has signed an informed consent form; making sure all the patient's questions and concerns have been addressed; assisting with positioning of the patient; performing skin preparation if ordered; and preparing the room for the procedure.

12. Perform a skin prep for surgery.
    Refer to Procedure 57-3.

13. Perform a surgical hand scrub.
    A surgical hand scrub is done to lower the number of transient and resident bacteria on the practitioner's hands so that the risk of wound contamination is reduced (see Procedure 57-4).

14. Outline the rules for setting up and maintaining a sterile field.
    Sterile surfaces must never come in contact with nonsterile surfaces. If this occurs, the sterile surface immediately is considered contaminated. The rules for maintaining a sterile field include keeping talking to a minimum; maintaining sight of the sterile field; and never crossing over the sterile field. Anything that falls below the edge of the Mayo tray and within a 1-inch border surrounding the tray is considered contaminated. A sterile barrier that is wet, cut, or torn is contaminated. Sterile gloved hands must be kept above waist level at all times. An item is never removed from and then again put into the field. A sterile package should be opened from the top of the entire sterile field. The contents should be transferred to the sterile field without crossing over the sterile area. If a sterile package falls to the floor, it must be discarded. If any doubt exists about sterility, the field must be considered contaminated and the process must start all over again.

15. Open a sterile pack to create a sterile field.
    Refer to Procedure 57-5.

16. Transfer sterile instruments and pour solutions into a sterile field.
    Refer to Procedures 57-6 and 57-7.

17. Apply sterile gloves without contaminating them.
    Refer to Procedure 57-8.

18. Demonstrate how to assist with a minor surgical procedure and suturing.
    Refer to Procedures 57-9 and 57-10.

19. Summarize postoperative instructions and wound care.
    If medication is prescribed, review the purpose of the medication and directions for its use with the patient and his or her companion and make a follow-up appointment. The patient should be taught to care for himself or herself at home after surgery and should receive both verbal and written instructions. Explain to the patient the importance of calling the office if any questions arise or if he or she notes redness around the wound area.
operative site, bleeding from the wound, fever, swelling, or increasing or severe pain. If the patient does not call within the next 24 hours, the medical assistant should call the patient.

20. Demonstrate how to remove sutures and the technique for removing surgical staples.
   Refer to Procedures 57-12.

21. Explain the process of wound healing.
   All wounds go through a healing or repair process that has three phases. The lag phase occurs first when the blood vessels contract to control hemorrhage, platelets form a fibrin network, and a clot dries into a scab. Proliferation is a new growth period during which tissues repair themselves. During the final, or remodeling, phase, a bridge of new tissue is built to close the gap of the wound. Collagen gives the wounded tissues strength and forms scar tissue. Wounds are classified by the way they repair themselves: either by first intention, with clean, straight edges that heal quickly, or by granulation (or second intention), as in tissues that are severely damaged and are left open or fail to close.

22. Properly apply dressings and bandages to surgical sites.
   Refer to Procedures 57-11 and 57-13.

23. Conduct patient education in aseptic technique and surgical procedures.
   The best time for a medical assistant to instruct the patient in aseptic techniques to be used at home is during an aseptic procedure. Patient education includes the purpose and importance of hand washing; using disposable tissues to cover the nose and mouth when coughing or sneezing and properly disposing of used tissues; the differences between sterile and clean dressings and bandages; and step-by-step instructions on how to change a dressing properly and dispose of contaminated items.

24. Discuss the legal and ethical concerns regarding surgical asepsis and infection control.
   The medical assistant must know what procedure is to be performed and whether the patient has received and provided informed consent. The medical assistant must realize the full extent of his or her role as the patient’s advocate and the physician’s agent. The more patients understand about their procedures, the more they comply with presurgical preparations, and the more likely they are to follow instructions and advice after surgery. A major responsibility of the medical assistant is to adhere strictly to aseptic technique and to correct immediately any breach in technique.

CONNECTIONS

Study Guide Connection: Go to the Chapter 57 Study Guide. Read and complete the activities.

Evolve Connection: Go to the Chapter 57 link at evolve.elsevier.com/kinn to complete the Chapter Review and Chapter Quiz. Peruse other resources listed for this chapter to increase your knowledge of Surgical Asepsis and Assisting with Surgical Procedures.