UNIT TEN: ASSISTING WITH SURGERIES

SURGICAL SUPPLIES AND INSTRUMENTS

SCENARIO

Tom Anderson, CMA (AAMA), works for Dr. Sheila Saminski, a dermatologist who frequently performs minor surgical procedures in the office. Tom assists Dr. Saminski with procedures and is also responsible for maintaining stock supplies in the minor surgery room, including solutions and medications, and for cleaning, maintaining, and inspecting the surgical instruments. Because no procedures are scheduled for today, Tom is planning to compile an inventory of supplies and equipment and perform routine maintenance activities.

While studying this chapter, think about the following questions:

- What solutions and medications should be available in the surgical area of a medical office?
- What are the typical instruments used in minor surgical procedures?
- How are surgical instruments identified and classified?
- How should surgical instruments be cared for and handled before, during, and after a surgical procedure?
- What types of sutures and needles are used in minor surgical procedures?

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. Describe typical solutions and medications used in minor surgical procedures.
4. Summarize methods for identifying surgical instruments used in minor office surgery.
5. Outline the general classifications of surgical instruments.
6. Describe the care of surgical instruments.
7. Identify types of sutures and surgical needles.
8. Explain the medical assistant's responsibility to help ease patients' concerns about procedures.
**VOCABULARY**

**abscesses** Localized collections of pus that may be under the skin or deep within the body and that cause tissue destruction.

**cannula** (kan'-yoo-lah) A rigid tube that surrounds a blunt trocar or a sharp, pointed trocar inserted into the body; when withdrawn, fluid may escape from the body through the cannula, depending on where it was inserted.

**curettage** (kúr'-éh-táj) The act of scraping a body cavity with a surgical instrument, such as a curette.

**dilation** The opening or widening of the circumference of a body orifice with a dilating instrument.

**dissect** To cut or separate tissue with a cutting instrument or scissors.

**fascia** A sheet or band of fibrous tissue deep in the skin that covers muscles and body organs.

**obturator** A metal rod with a smooth, rounded tip that is placed in hollow instruments to reduce injury to body tissues during insertion.

**patency** Open condition of a body cavity or canal.

**stylus** A metal probe that is inserted into or passed through a catheter, needle, or tube used for clearing purposes or to facilitate passage into a body orifice.

Office surgery is restricted to the management of minor problems and injuries. The medical assistant is expected to prepare the patient and the sterile field, assist the physician as needed, take care of the patient after the procedure, properly disinfect the area, and document appropriately. Some medical assistants are employed in outpatient surgical facilities and are expected to assist with procedures that once were performed in the hospital. Although these more difficult operations may involve complete gowning and gloving with surgical masks and caps, the two surgical chapters in this text limit discussion and descriptions to the routines necessary to prepare for and assist in minor surgery only. This chapter includes a discussion of surgical supplies and instruments, the care and handling of instruments, and the different types of surgical sutures and needles. It prepares you for Chapter 57, which presents sterilization, preparation of the sterile field, specific minor surgical procedures, and care of the patient.

**MINOR SURGERY ROOM**

When minor surgery is routinely performed, the medical office is designed to include a changing room and a minor surgery room that are separate from the other examining rooms. Larger surgery centers have recovery rooms and family waiting areas. The minor surgery room in the physician's office setting should be near a workroom with a sink and an autoclave if the room does not have its own. It should be easy to disinfect and uncluttered to allow easy movement and minimal dust collection. In addition to the operating table, equipment should include a clock with a second hand, an operating light, sitting stools, and Mayo stands (Figure 56-1). Cabinets with countertops are necessary to serve as a side or back table during the surgery. All surgical supplies are stored in these cabinets. Supplies used in this room should not be used elsewhere, and supplies used elsewhere should not be brought into this room.

**SURGICAL SOLUTIONS AND MEDICATIONS**

Treatment room supplies include standard solutions and medications that are used in minor surgery and dressing changes. Although the solutions and medications listed here are basic, every physician's office practice has preferred items and methods of applying them. The medical assistant is responsible for their care and for maintaining up-to-date supplies.

Sterile water is kept in two forms. Multiple-dose vials are used as a diluent for medications; larger containers of sterile water are for rinsing instruments that have been in a chemical disinfectant solution.

Sterile physiologic saline solution (0.9%) is also stocked in two sizes. The small multiple-dose vial is used for injection. A larger container of sterile saline is used for rinsing and irrigating wounds. These commercially prepared products are ordered from a medical supply company.

The surgical site on the patient must be prepared preoperatively with an antiseptic skin cleansing preparation to reduce the number of pathogens. Although it is not possible to remove all microorganisms from the skin, it is important to prepare the surgical site to remove transient and pathogenic microorganisms on the skin's surface and to reduce resident flora. In addition, the surgeon's hands and those of the medical assistant require disinfection to reduce the chances of wound contamination even though hands will be covered with sterile gloves. Surgical scrub preparations should have a broad antimicrobial action effective against bacterial spores; they also should work rapidly to reduce transient bacteria, show evidence of persistent activity on the skin, and work despite the presence of organic matter such as blood or wound drainage. Research indicates that chlorhexidine (Hibiscrub or Hibiclens) and povidone-iodine (Betadine) are safe and effective antiseptics.

Even minor surgical procedures require the use of anesthetics, which either are injected locally at the site of the procedure or may be sprayed on the skin as a preinjection anesthetic. For patients who find injections of local anesthesia painful or traumatic, the physician may first spray the injection area with a topical anesthetic, such as Fluori-Methane 15%, which is supplied in 3.5-ounce amber glass bottles for either fine or medium spray. Immediately after spraying the site, the physician makes a series of injections around the area with a local anesthetic.

Another topical anesthetic spray is ethyl chloride, a vapor coolant that controls pain associated with minor surgical procedures, such as lancing boils or incision and drainage of small abscesses, by causing localized freezing of the affected area. Because ethyl chloride is highly flammable, it should never be used in the presence of electrical cauterizing equipment, and it requires the appli-
cation of petroleum jelly to surrounding areas to protect them from the cooling action of the spray. It has a short duration, so all equipment must be prepared and the physician must be ready to perform the procedure before it is applied.

Local anesthetics are injected into the subcutaneous tissue. These produce a temporary cessation of feeling at the site of injection by blocking the generation and conduction of nerve impulses. Many different types of local anesthetics are available, but all share the same suffix, -caine. Those used most frequently include lidocaine (Xylocaine), chloroprocaine (Nesacaine), and bupivacaine (Sensocaine). Local anesthetics are purchased in multiple-dose vials of 30 to 50 mL and in varying strengths, such as 0.5%, 1%, and 2%. They begin acting relatively quickly, within 5 to 15 minutes; the duration of action depends on the type of anesthetic, but they usually last 1 to 3 hours. When highly vascular areas are involved, local anesthetics containing epinephrine may be used. Epinephrine causes vasoconstriction at the site, which keeps the anesthetic in the tissues longer, prolonging its effect. It also minimizes local bleeding. However, epinephrine is not used in areas where decreased circulation may cause problems with healing, such as fingertips or toes.

All tissues removed, or biopsied, from the patient are sent to the pathology laboratory for analysis. A 10% formalin solution typically is used to preserve excised tissue for specimens. Specimen bottles are purchased with preservatives included and should be part of the supplies prepared for a surgical procedure if a biopsy is to be done. The physician places the specimen in the container, and the medical assistant is responsible for accurately labeling the container with the patient’s name, the date of collection, and the type of specimen.

Sometimes the physician may want to use topical silver nitrate (AgNO₃) solution or coated applicator sticks to stop localized bleeding, such as with epistaxis (nosebleed) or capillary bleeding at the site of a wound. The applicators must be kept in lightproof brown containers, and the most commonly used strength is 20%. The applicator sticks are convenient for use in the mouth or nose.

**CRITICAL THINKING APPLICATION 56-1**

Tom is ready to do an inventory of supplies in the minor surgery room. What solutions, medications, and miscellaneous supplies should he make sure are on hand for the busy surgical schedule planned for next week?

**ADDITIONAL SURGICAL SUPPLIES**

- Wound drains (Penrose drains)—rubber drains placed in a wound at the end of a surgical procedure to drain excess fluid
- Sterilized gauze squares or strips saturated with petroleum jelly or petrolatum—used to pack wounds
- Sterilized iodoform gauze strips, ⅛ inch to 2 inches wide and impregnated with iodoform iodine—used to pack abscesses to act as a wick to draw out the infection; also used as a local antibacterial agent (Figure 56-2)
- Surgical sponges—used to absorb blood and protect tissues during surgery
- Syringes and needles—used to inject local anesthetics and irrigate wounds
Surgical Instruments

The medical assistant must know which instruments are used for each procedure and should be able to identify and understand the function of the surgical instruments preferred by the physician. Instruments have clearly identifiable parts and can be visually differentiated from one another (Procedure 56-1). The basic components are the handle, the closing mechanism, and the part that comes in contact with the patient, commonly called the jaws. Many instruments can be ordered with either straight or curved tips, depending on the operator’s preference and the task to be performed.

Instruments have either ring handles (finger rings; Figure 56-3, A and B) or spring handles (Figure 56-3, C; these sometimes are called thumb-handled or thumb grasp instruments). Scissors are an example of a ring-handled instrument; tweezers have spring handles. Some instruments have a hinge type of mechanism called a box lock.

Ratchets resemble gears and are located just below the ring handle (see Figure 56-3, A and B). They are used to lock an instrument into position. Most ratchets can be closed at three or more positions, depending on the thickness of the tissue or materials being grasped.

The inner surfaces of the jaws on some instruments have ridged teeth called serrations, and both ring-handled and thumb-type instruments may have them. These serrations may be criss-cross, horizontal, or lengthwise (Figure 56-4). Serrations prevent small blood vessels and tissue from slipping out of the jaws of the instrument.

Instrument tips or jaws may be plain tipped or mouse toothed (Figure 56-5, A). If the tooth is large, the tip is called rat toothed (Figure 56-5, B). Tissue forceps usually are toothed instruments and are identified by the number of intermeshing teeth (e.g., 12, 23, 34). Allis forceps (Figure 56-5, C) are used to grasp delicate, soft tissues, so the teeth are finer, shallower, and more rounded. Other forceps have teeth that are sharper and deeper. Still others have sharp, hooklike, single or double teeth, such as a tenaculum or vulsellum. Usually, the tenaculum has a single, sharp hook on each jaw. The vulsellum has a double hook that resembles the fangs of a snake (see Figure 56-17, F and H). Toothed instruments commonly have ratchets for locking into towels or human tissues. Instrument tips may also be either straight or curved, depending on their use.

An instrument is usually named for its use (e.g., splinter forceps, for removing splinters) or after the person or people who developed it (e.g., Mayo-Hegar needle holder). Many general instruments are identified by the part of the body on which they are used (e.g., rectal speculum and nasal speculum).

There are thousands of surgical instruments with multiple name variations. The same instrument may have two or three different names, depending on the physician identifying it or the part of the country in which the practice is located. A physician may ask for a clamp or forceps when a Kelly hemostat is wanted. It is important to learn the physician’s preference in terminology.
PROCEDURE 56-1

Identify Surgical Instruments

**GOAL:** To identify, correctly spell the names of, and determine the use or uses of standard office surgical instruments or those selected by your instructor.

**EQUIPMENT and SUPPLIES**
- Curved hemostat
- Straight hemostat
- Dressing (thumb) forceps
- Paper and pen
- Disposable scalpel and blade
- Dissecting scissors
- Towel clamp
- Vaginal speculum
- Bandage scissors
- Allis tissue forceps

**PROCEDURAL STEPS**

1. Look for the following parts that determine use: box lock, serrations, finger rings, cutting edge, noncutting edge, thumb type, teeth, ratchets, and electric attachments.
   **PURPOSE:** To determine the combination of features and parts for each instrument.

2. Consider the general classification of the instrument: cutting and dissecting, grasping and clamping, retracting, or probing and dilating.

**PURPOSE:** The clue to the name of the instrument may be found by determining the classification.

3. Carefully examine the teeth and serrations.
   **PURPOSE:** The clue to the name of the instrument may be found by determining its distinctive parts.

4. Consider the length of the instrument to determine the area of the body for which it is used.
   **PURPOSE:** The clue to the name of the instrument may be found by determining where it can reach.

5. Try to remember whether the instrument was named for a famous physician, university, or clinic.
   **PURPOSE:** Many instruments are named for the inventor.

6. If the instrument is a pair of scissors, look at the points and determine whether the tips are sharp-sharp, sharp-blunt, or blunt-blunt.

7. Carefully compare the instrument with similar instruments with which you are familiar to determine whether it is in the same category or has the same name.
   **PURPOSE:** A clue to the name of an instrument may be found in the knowledge you already have.

8. Write, with correct spelling, the complete name of each instrument, including its category and use.

Learn to recognize the distinctive parts of instruments and the reasons for each part, and you will quickly build a working knowledge of hundreds of instruments.

**CLASSIFICATIONS OF SURGICAL INSTRUMENTS**

Surgical instruments generally are classified according to their use, and most belong to one of four groups:
- Cutting
- Grasping
- Retracting
- Probing and dilating

**Cutting and Dissecting Instruments**

Cutting and dissecting instruments, which are used for cutting, incising, scraping, punching, and puncturing, include scissors, scalpels, chisels, elevators, curettes, punches, drills, and needles. Instruments with a sharp blade or surface can cut, scrape, or dissect.

**Bandage Scissors (Figure 56-6, A)**
- Blunt probe tip
- Easily inserted under bandages with relative safety
- Used to remove bandages and dressings

**Operating (Surgical) Scissors**

**Metzenbaum (Metz) Scissors (Figure 56-6, B)**
- Most frequently used length is 5 1/2 inches
- Used to cut and dissect tissue

**Mayo Scissors (Figure 56-6, C and D)**
- Curved or straight blade tips
- Used to cut and dissect fascia and muscle
- Straight Mayo scissors can be used as suture scissors

**Iris Scissors (Figure 56-6, E and F)**
- Usual length is 4 inches
- Curved or straight blade tips
- Straight tips usually are used for suture removal

**Littauer Stitch or Suture Scissors**
- Blade has beak or hook to slide under sutures
- Used to remove sutures

**Disposable Scalpels (Figure 56-7)**
- **Handles:** No. 3 is the standard handle; No. 3L and No. 7 are used in deeper cavities
- **Blades:** No. 15 is commonly used; No. 10, 11, and 12 are used for specialty incisions
**Grasping and Clamping Instruments**

Clamping instruments are used for many different tasks. Many have a sharp tooth or teeth and are used to retract, hold, and manipulate fascia. The most common clamping instruments are hemostats, which originally were designed to stop bleeding or to clamp severed blood vessels. Some clamping instruments are used to grasp other instruments or sterilized materials. Sometimes hemostats and other clamping instruments are used interchangeably.

**Hemostat Forceps (Figure 56-8, A and B)**
- Jaws may be fully or partly serrated, without teeth
- May be curved or straight
- Used to clamp small vessels or hold tissue
- Mosquito forceps (4 inches) are smaller and used for very small vessels
- Crile forceps (5 inches) are medium sized
- Kelly forceps (6 to 7 inches) are larger

**Needle Holders (Figure 56-8, C and D)**
- Jaws are shorter and stronger than hemostat jaws
- Jaws may be serrated or may have a groove in the center
- Are 4 to 7 inches in size
- Used to grasp a suture needle firmly

**Splinter Forceps**
- Design and construction vary
- Fine tip for foreign object retrieval

**Adson Forceps (Figure 56-9)**
- Used to grasp tissue and in suturing

**Plain Thumb (Dressing) Forceps (Figure 56-10)**
- Manufactured in lengths from 4 to 12 inches
- Varying types of serrated jaws but no teeth
- Used to insert packing into or remove objects from deep cavities

**Towel Forceps (Towel Clamp) (Figure 56-11)**
- May have sharp oratraumatic tips
- Various lengths from 3 to 6½ inches
- Used to hold drapes in place during surgery

**Allis Tissue Forceps (Figure 56-12, A)**
- Available in different lengths and jaw widths
- Used to grasp tissue, muscle, or skin surrounding a wound

**Foerster Sponge Forceps (Figure 56-12, B)**
- Used to hold gauze squares to sponge the surgical site

**Transfer Forceps (Figure 56-12, C to E)**
- Many sizes and lengths available
- Sterile transfer forceps may be used to arrange items on a sterile tray

**Adson Thumb Forceps (Figure 56-13, A and B)**
- Usually in 4-inch lengths
- Manufactured with or without teeth
- Same use as Adson forceps

**Bayonet Forceps (Figure 56-13, C to E)**
- Manufactured in different lengths
- Smooth tipped
- Used to insert packing into or remove objects from the nose and ear
Plain-Tip Tissue Forceps (Figure 56-13, F)
- Manufactured in different lengths
- Atraumatic for tissue
- Used to grasp tissue, muscle, or skin surrounding a wound

Toothed Tissue Forceps (Figure 56-13, G)
- Manufactured in 4- to 18-inch lengths
- Pincher grip
- Used to grasp tissue, muscle, or skin surrounding a wound

Retractors
Retracting instruments hold tissue away from the surgical wound (incision). Depending on the physician’s preference, skin hooks and Senn retractors are used to retract during most minor surgical procedures. These instruments are hand-held and are used for skin retraction.

Senn Retractor (Figure 56-14)
- Used to retract small incisions or to secure a skin edge for suturing
- Flat end is a blunt retractor
- Three-prong end may be sharp or dull

Probes and Dilators
Probes and dilators are used for both surgery and examinations. Probes can be used to search for a foreign body in a wound or to enter a fistula. Dilators are used to stretch a cavity or opening.
for examination or before inserting another instrument to obtain a tissue specimen.

Probes (Figure 56-15, A to C)
- Length ranges from 4 to 12 inches; available with or without bulbous tip
- May be smooth or may have a grooved director
- Used to find foreign bodies embedded in dermal tissue or muscle or to trace a wound tract

Trocar and Obturators (Figure 56-15, D to G)
- Consist of a sharply pointed stylus (obturator) contained in a cannula (outer tube)
- Available in various sizes

FIGURE 56-14  Senn retractor.

• Used to withdraw fluids from cavities or for draining and irrigating with a catheter

**Specula (Figure 56-16)**
- Most common dilator used
- Valves are spread apart, dilating the opening
- Used to open or distend a body orifice or cavity

**Nasal Specula (see Figure 56-16, A and B)**
- Valves can be spread to facilitate viewing
- Applicator or snares can be introduced through the valves
- Used to spread the nostrils for examination

**SPECIALTY INSTRUMENTS**

Although all instruments fall under the same four categories as the surgical instruments just discussed, the remaining instruments are organized into specialty groupings. Presenting the instruments in this manner makes it easy to see how the instruments relate to particular examinations. In addition to recognizing the name and use of each instrument, the medical assistant must organize and set out the instruments needed for each particular examination in what is called a tray setup.

**Gynecologic Instruments**

**Foerster Sponge Forceps (Figure 56-17, A)**
- Round and serrated tips
- Used in the same way as the dressing forceps

**Placenta Forceps (Figure 56-17, B)**
- Used to remove tissue from the uterus

**Bozeman Uterine Dressing Forceps (Figure 56-17, C)**
- Designed to hold sponges or dressings
- Capable of reaching the cervix through the vagina
- Used to swab the area or apply medication

**Endocervical Curette (Figure 56-17, D)**
- Smaller than the uterine curette
- Used in the same way as the uterine curette

**Sims Uterine Curette (Figure 56-17, E)**
- Available in several sizes
- Hollow and spoon shaped, used for scraping
- Used to remove polyps, secretions, and bits of placental tissue

**Schroeder Uterine Vulsellum Forceps (Figure 56-17, F)**
- Used to hold tissue (e.g., the cervix) while a tissue specimen is obtained or to lift the cervix to view the fornix

**Long Allis Forceps (Figure 56-17, G)**
- Same as Allis forceps
- Used in deeper body cavities

**Schroeder Uterine Tenaculum Forceps (Figure 56-17, H)**
- Very sharp, pointed tips
- Used in the same way as the vulsellum forceps

**Hegar Uterine Dilators (Figure 56-18, A)**
- Available in sets
- Double or single ended
- Used to dilate the cervix for dilation and curettage
Sims Uterine Sounds (Figure 56-18, B)
- Used to check the patency of the cervical os or the urethral meatus

Ophthalmologic and Otolaryngologic Instruments

Krause Nasal Snare (Figure 56-19, A)
- Wire loop at the tip that can be tightened
- Used to remove polyps from the nares

Metal Tongue Depressor (Figure 56-19, B)
- Used to depress the tongue for oral examinations

Hartmann “Alligator” Ear Forceps (Figure 56-19, C)
- Has a 3½-inch shaft and is made in a variety of styles
- Action of the jaw similar to that of an alligator’s jaw
- Used to remove foreign bodies or polyps

Laryngeal Mirror (Figure 56-19, D)
- Made in various sizes
- May have a nonfogging surface
- Used for examination of the larynx and postnasal area

Ivan Laryngeal Metal Applicator (Figure 56-19, E)
- Holds cotton in place with its roughened end; used to swab or sponge throat or postnasal tissue
- Six to 9 inches long with curved end for use in throat or postnasal areas
- Used to remove foreign bodies imbedded in the pharynx

“Buck” Ear Curette (Figure 56-19, F)
- Made with sharp or blunt scraper ends
- Manufactured in various sizes
- Used to remove foreign matter from the ear canals

Sharp Ear Dissector (Figure 56-19, G)
- Used to remove debris from the ear canal

Biopsy Instruments

Cervical Biopsy Forceps (Figure 56-20, A)
- Available with or without teeth
- Used to obtain cervical specimens for diagnostic examination

Rectal Biopsy Punch (Figure 56-20, B)
- Manufactured with interchangeable stems
- Available in different lengths and styles
- Used through a proctoscope or sigmoidoscope

Silverman Biopsy Needle
- Manufactured with a split cannula
- Stylus is removed, and cannula is inserted to retrieve the specimen
- Needle biopsy can eliminate the need for surgical incision

Genitourinary Instruments

Catheter Guide (Figure 56-21, A)
- Metal guide
- Used with extreme caution
**Foley Catheter with Inflated Balloon (Figure 56-21, B)**
- Manufactured in sizes 8 to 32 French with a double rubber lining toward the tip (each French unit is equal to 1.3 mm; the higher the number, the larger the lumen)
- After insertion, sterile solution is injected into the inner lining (inflating the balloon) to hold it in the bladder
- Used as an indwelling catheter

**Red Robinson Catheter (Figure 56-21, C)**
- Soft rubber urethral catheter in sizes 8 to 32 French
- Inserted temporarily into the bladder for drainage or to obtain a specimen

**12-mL Luer-Lok Syringe (Figure 56-21, D)**
- Used for injecting amounts greater than 5 mL
- Typically used to inject sterile saline into a catheter to inflate the balloon at the tip of an indwelling catheter

**Critical Thinking Application 56-2**
Tom is preparing instruments and supply packs for specific procedures performed by Dr. Saminski. One of the packs he is preparing for the autoclave is for removal of a nasal polyp. Based on your understanding of typical and specialty instruments and supplies, what items should Tom include in the instrument pack?

**Care and Handling of Instruments**
Because instruments are expensive and the physician’s skill depends on their quality, the medical assistant must properly care for each instrument to maximize its life and ensure that every part is in safe working order.

Most instruments are made of fine-grade stainless steel. The term *stainless* usually is taken too literally. Although stainless steel does resist rust and keeps a fine edge and tip longer, even the best stainless steel may develop water spots and stains, especially if water with a high mineral content is used. Proper hardness and flexibility are important. Inexpensive instruments that are chrome plated may be too brittle or too soft. In addition, mistreatment of chrome-plated instruments can cause minute breaks in the finish, which may become a source of contamination or may tear the surgeon’s gloves.

All instruments should be carefully examined when they are purchased. Scissors should be tested to see whether they shear the full length of the blades completely to the tip. If the scissors cut a piece of cloth cleanly and do not chew at any point, even at the tip, they are functioning correctly. Teeth and serrations should be checked to see whether they intermesh completely and whether the jaws are even on the sides and tip. Each instrument should be felt over its entire surface for any rough areas that may
tear or snag the surgeon’s gloves or act as a future source of contamination. Box locks and hinges must work freely but should not be too loose. Thumb- and spring-handled instruments must have the correct tension and meet evenly at the tips. After inspection, instruments should be cleaned and checked again for possible faulty workmanship before sterilization.

Under no circumstances should instruments be bundled together or allowed to become entangled. Do not mix stainless steel instruments with others made of different metals, including chrome-plated instruments, because this may cause electrolysis and result in etching. If an instrument is accidentally dropped, it may be permanently damaged. If scissors are dropped with the blades partly open, there may be a nick at the point where the blades cross. Any damaged or malfunctioning instrument must be disposed of to prevent complications during a surgical procedure.

After a surgical procedure, contaminated instruments should be placed in a basin of disinfectant solution with heavier instruments on the bottom of the basin and lighter, more delicate instruments on top. Always unlock each instrument before immersion in the chemical decontaminant to permit cleansing of the entire surface area. Never allow blood or other coagulable substances to dry on an instrument, because they will be difficult to remove. If immediate disinfection is not possible, the instruments should be rinsed well and placed in a cold water solution with a blood solvent and mild detergent. The detergent increases the wetting ability of the water, giving the instrument surfaces better exposure to the solution. It is best to use a detergent that has a neutral pH and low suds and can be rinsed off easily. The manufacturer’s recommendations for the correct dilution and time of immersion of the various disinfectants and blood solvents must be strictly followed for the chemicals to be effective.

When the surgical procedure is completed, the receiving basin for instruments should be transferred from the surgical area to the disinfection and sterilization room. It is important to remove used instruments from the patient’s view as soon as possible. After disinfection is complete, instruments should be rinsed thoroughly and either washed by hand or washed mechanically using an ultrasonic device.

Some delicate instruments, such as microsurgical and lensed instruments, should be washed by hand with a mild, low-sudsing, neutral pH detergent solution and a soft brush. The instruments should be cleaned while submerged to prevent the airborne spread of microorganisms. Throughout the cleaning process, the medical assistant should wear heavy utility gloves to prevent possible exposure to contaminants. Instruments then should be rinsed with distilled water, dried with a lint-free cloth, and inspected for proper functioning before they are packed for sterilization.

Mechanical washing, such as with an ultrasonic device, can be used for most instruments and is an especially good method for cleaning sharp instruments to prevent injuries. With an ultrasonic cleaning unit, the instruments are immersed in a cleaning solution and the device produces sound waves that clean contaminants from the instruments’ surfaces. The unit then rinses and dries the instruments, leaving them ready for the sterilization process. However, manufacturers’ guidelines should be followed for rubber and plastic materials.

After disinfection and inspection, the instruments are ready for the sterilization process. This procedure is discussed in Chapter 57.

Commercially prepared, disposable packs are available for most minor surgical procedures. They save time and eliminate the cleaning and autoclaving of reusable stainless steel instruments, but they may be too costly for individual practices.

**CRITICAL THINKING APPLICATION 56-3**
Tom is responsible for inspecting and caring for all the surgical instruments in the minor surgery room and for cleaning and preparing contaminated instruments for autoclaving. He is in the process of writing an addition to the office policies and procedures manual on the management of surgical instruments. Based on what you know about the care and handling of surgical instruments, what should Tom include in the policy?

**DRAPES, SUTURES, AND NEEDLES**
Disposable surgical drapes are available in several different materials and sizes and typically have an opening (fenestration) for the operative site (Figure 56-22). The drape is placed over the operative area using sterile technique after the patient’s skin preparation has been completed. This procedure is presented in Chapter 57.
Sutures

The word *suture* is used as both a noun and a verb. As a noun it refers to a surgical stitch or to the material used to close a wound. As a verb it refers to the act of stitching. Modern surgery and the use of sutures began in 1865, when Lister developed antisepsis and the disinfection of suture materials. Many kinds of materials have been used over the centuries, including precious metals, horse hair, animal tendons, and cotton and linen cord. Most of the improvements in suture materials and techniques have occurred in the past 50 years. The primary purpose of a suture is to hold the edges of a wound together until natural healing occurs.

A suture may also be used as a ligature. This is a strand of suture material used to tie off a blood vessel or to strangulate tissue. If a ligature is used to tie off an internal tubular structure, it must last permanently or long enough for the structure itself to disintegrate. The ideal suture material has certain characteristics:

- Easy to handle and makes a secure knot
- Does not induce a localized tissue reaction and is nonallergenic
- Has adequate strength without cutting through tissue
- Can be sterilized

The physician will request a certain type of suture based on the specific properties of the suture material, the desirable rate of absorption, the size of the suture, and the type of needle the physician prefers. Both natural and synthetic suture materials are available. Sutures may be classified as either absorbable or non-absorbable. Many different suture materials are available, each having its advantages and disadvantages. Suture materials commonly used in minor surgical procedures are described in the following paragraphs (Figure 56-23).

Absorbable Sutures

Absorbable sutures are dissolved by the body's enzymes during the healing process. They are used when deep incisions or lacerations require inner layers of sutures to close the wound. Absorbable suture material is also used in areas where suture removal is difficult, as in oral surgery. An example of an absorbable suture material is surgical catgut, which is obtained from sheep, cattle, or pig intestine. Plain catgut is used in tissues that heal most rapidly, such as mucous membranes and subcutaneous tissues, because it is broken down within a week. Chromic catgut is coated with chromic salts, which delays the absorption of the suture material up to 80 days.

Catgut once was the absorbable suture material of choice, but it has been replaced in recent years by Vicryl, a synthetic absorbable suture made of polyglactin. Other synthetic absorbable suture materials include Dexon, PDS, and Maxon. These materials remain stable longer than natural catgut (up to 11 weeks), allowing the wound to heal completely before absorption occurs.

Nonabsorbable Sutures

Nonabsorbable suture material is left in the wound site until healing is complete. It frequently is used in minor surgical procedures performed in the medical office, because most of the suturing required is superficial, and it can be used in areas where sutures can be removed after healing has taken place. A common,
nonabsorbable suture material is silk, because it is strong and easy to tie. It is treated with a coating to prevent tissue drag and flaking. Polyester fiber sutures, such as Dacron and Prolene, are among the strongest nonabsorbable sutures, along with surgical steel. These fine filaments are braided and have great tensile strength. Nylon suture is strong and has a high degree of elasticity. It is primarily used for skin closure. Owing to its elasticity and stiffness, many knots must be used, because the knots tend to untie if placed incorrectly.

Surgical staples can also be used for skin closure. They are made of stainless steel or titanium and are available in different sizes. They are applied and removed with specific staple instruments (Figure 56-24). Other techniques of wound closure include Steri-Strips, which are self-adhesive tapes that are placed over the wound, pulling the wound edges together. Steri-Strips can be used to support a wound if there is potential tension at the site or for superficial wounds such as a laceration of the forehead. Tissue adhesives, similar to glue, can also be used for superficial wounds.

**Suture Sizing and Packaging**

Suture material is available in a variety of diameters and lengths. The diameter of the suture strand determines its size; the smaller gauges are numbered below 0 (pronounced aught), and the larger gauges are identified with numbers above 0. For instance, 2-0 suture is thinner than size 0, which is thinner than size 2. The sizes from 2-0 to 6-0 are used most frequently in the medical office. The length of the suture material may vary, with strands precut in 18-, 24-, 54-, and 60-inch lengths (Figure 56-25).

**SUTURE SIZES**

<table>
<thead>
<tr>
<th>Suture size</th>
<th>Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.35 mm</td>
</tr>
<tr>
<td>1</td>
<td>0.40 mm</td>
</tr>
<tr>
<td>2</td>
<td>0.5 mm</td>
</tr>
<tr>
<td>3-0</td>
<td>0.30 mm</td>
</tr>
<tr>
<td>2-0</td>
<td>0.20 mm</td>
</tr>
<tr>
<td>30</td>
<td>0.15 mm</td>
</tr>
<tr>
<td>50</td>
<td>0.10 mm</td>
</tr>
<tr>
<td>60</td>
<td>0.07 mm</td>
</tr>
</tbody>
</table>

**Needles**

Surgical needles are chosen according to the area in which they are to be used and the depth and width of the desired suture. They are classified according to shape, which may be straight or curved (Figure 56-26). Most sutures are applied with curved needles, because they allow the physician to penetrate the surface and then come back up on the other side. The sharper the curve of the needle, the deeper the surgeon can pass it into the tissue. The point of a needle can be a taper or a cutting edge. A taper is used on delicate tissues. The cutting edge needle is used on the skin. It lacerates the skin as the needle is passed through. This is advantageous on tougher tissues, such as connective tissue.

Needles are manufactured with the suture material attached, or swaged, to the needle. Theseatraumatic needles do not have
an eyelet and cause the least amount of tissue trauma as they are passed through the tissue. Manufacturers package suture strands with the suture needle attached in peel-apart sterile, disposable packages. These may be obtained as single, individually packed or as multipack sutures in a variety of needle types and sizes with a wide range of suture materials and lengths. The most common needle type for minor skin repair is the curved, cutting edge, swaged needle.

**Summary of Scenario**

Tom has worked for Dr. Samanski for 2 years and is familiar with his preference in surgical solutions, local anesthesia, suture materials, and the typical instruments used in her practice. He also has worked hard to update the policy and procedures manual to include standards for instrument care so other medical assistants in the office will know how instruments should be sanitized, disinfected, inspected, and prepared for the autoclave. Tom realizes he needs to continue his education in surgical procedures and takes advantage of professional workshops on the topic. He and Dr. Samanski work well together in the minor surgery area of the office, and Tom consistently attempts to stay up-to-date on the surgical advances, medications, and instruments Dr. Samanski uses in her practice.

**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. Describe typical solutions and medications used in minor surgical procedures. Solutions used in minor surgery include sterile water for mixing with medications or rinsing instruments; sterile saline for injection or wound irrigations; antiseptic skin cleansers, such as Betadine or Hibiclens for site preparations; and local anesthetics, including ethyl chloride or Fluori-Methane topical applications, as well as lidocaine, Nesacaine, or Sensor-

caine injectables. These local anesthetics may come packaged with or without epinephrine. The physician also may use topical silver nitrate to control local bleeding.
5. Outline the general classifications of surgical instruments. Surgical instruments are classified according to their use as cutting, grasping, retracting, probing, or dilating tools. The components of the instrument include the type of handle, the closing mechanism, and the jaws. Instrument tips may be either straight or curved and toothed or not toothed. The instruments used in minor surgical procedures depend on the type of procedure and the physician’s preference.
6. Describe the care of surgical instruments. Surgical instruments are expensive and must be cared for properly to maintain function and maximize life. Instruments must be examined when
purchased for proper working order and possible faults with mechanisms. Stainless steel instruments should be kept separate from other metal types. Each instrument must be cleaned according to the manufacturer’s guidelines, unlocked, and disinfected immediately after use. Most instruments can be cleaned with an ultrasonic washer, which helps prevent injuries.

7. **Identify types of sutures and surgical needles.**

Suture material is available as absorbable, for internal sutures, and non-absorbable, for skin closure. Catgut and Vicryl are the two most popular absorbable materials; nonabsorbable sutures can be made of silk or nylon, or staples can be used. Suture materials range in size from smaller gauges (i.e., below 0 [aught], used for finer tissues) to thicker gauges (above 0) and are available in various lengths. Surgical needles are either straight or curved. Most needles are manufactured with swaged suture material.

8. **Explain the medical assistant’s responsibility to help ease patients’ concerns about procedures.**

The medical assistant can help ease the patient’s fears by answering his or her questions. Explaining the patient preparation for a procedure, how the procedure will be performed, and what to expect afterward helps make the procedure go more smoothly and encourages the patient to follow the physician’s advice and orders. 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.