

VETERINARY

Instruments and Equipment

A POCKET GUIDE



Fourth Edition

Teresa F. Sonsthagen

ELSEVIER

Veterinary Instruments and Equipment

A Pocket Guide

FOURTH EDITION

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Preface

Becoming familiar with veterinary instruments and equipment is a vital part of the veterinary technology curriculum. To become a valuable member of the clinical team, it is crucial that students learn to recognize individual veterinary instruments, their main function, and their special characteristics.

This book was developed to help students who may not have access to these instruments when they are ready to study. A firm grasp of how these instruments are used increases the useful life span of the instruments and prevents injuries from improper use.

This book was designed in a flash card format so that one can flip the book to separate the picture from the name and descriptions. This allows students to quiz themselves. This self-study tool features instruments and equipment used in all aspects of veterinary medicine.

The book is organized into two sections. Restraint, medical, and diagnostic instruments are covered in the first section. Surgical instruments are covered in the second section and are organized beginning with general surgical instruments and proceeding to specialized instruments for orthopedic and ophthalmic procedures.

The original list of instruments and equipment to be included was reviewed by veterinary technician educators from all parts of the United States and Canada, and many were added at their suggestion. If any have been missed, it is not for lack of trying, but let us know if you have ideas for others to include in the next edition.

Be sure to check out the Evolve site accompanying this edition, with its updated image collection, timed instrument quizzes, and the image library, with selected instruments that you can zoom in

to and rotate. Register now at
<http://evolve.elsevier.com/Sonsthagen/instruments/>

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PART 1

General Medical Instruments and Restraint Equipment

OUTLINE

- Chapter 1. Instruments for the Administration of Medicine
- Chapter 2. Diagnostic Instruments
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- Chapter 4. Instruments for the Identification of Animals
- Chapter 5. Instruments Used for Bovines
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- Chapter 12. Instruments Used for Pigs, Sheep, and Goats
- Chapter 13. Restraint Equipment for Canines and Felines
- Chapter 14. Diagnostic Imaging Instruments and Equipment
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CHAPTER 1

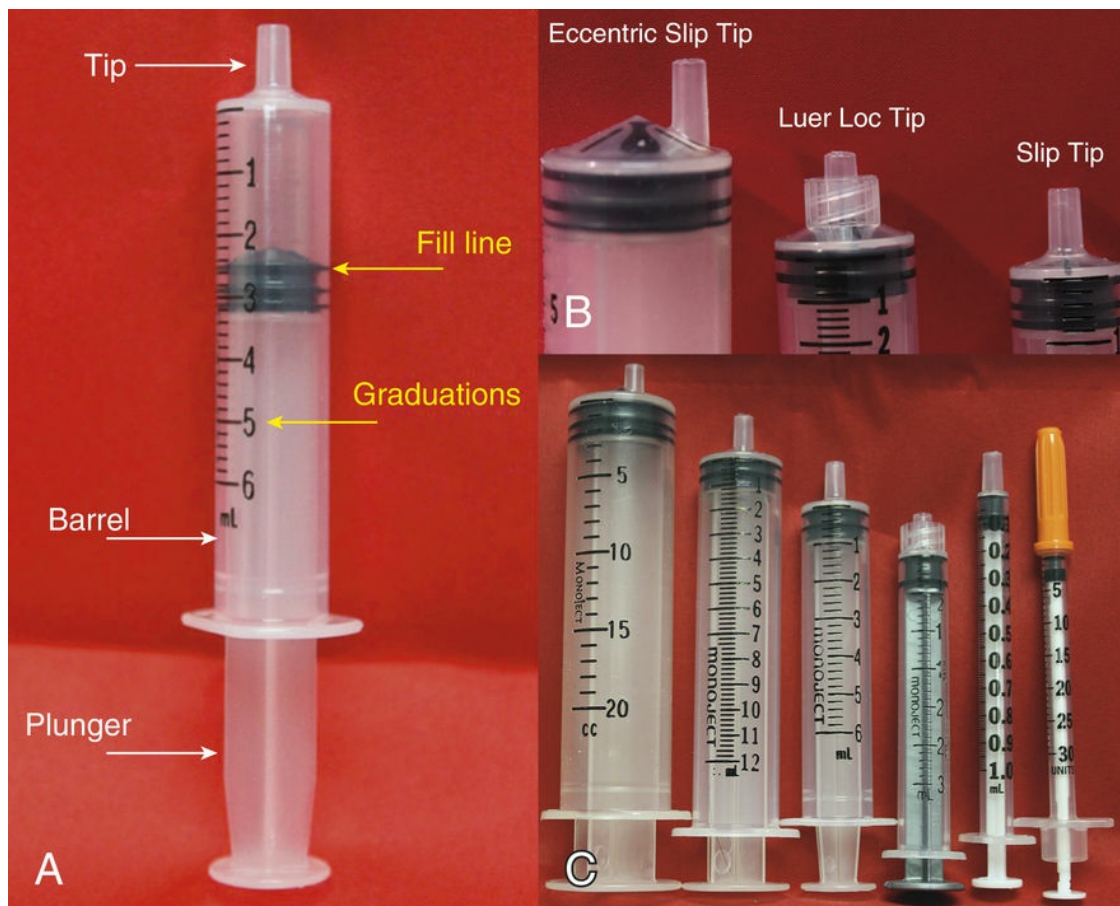
Instruments for the Administration of Medicine



This chapter describes the instruments that are used to deliver medications or to draw blood, urine, and tissue samples from the body.

INSTRUMENT

Disposable Syringe



● Function

To administer parenteral medications or to draw blood or other fluids from the body.

◆ Common Name

Syringe

■ Characteristics

Plastic syringes are made of three parts. 1.1A, The tip is the part to which a needle can be attached, and it can fit into the hub of a catheter. The tip is available in three types (image 1.1B). A slip tip can be centered, or it can be eccentric, meaning it is positioned to one side of the barrel; a Luer-Lok tip has threads onto which a needle hub can be turned and locked into place. The barrel determines the size and is marked in graduations to measure the solutions to be delivered. The plunger has a rubber stopper on the end of a shaft which pulls or pushes the solutions into or out of the syringe. The rubber stopper, as indicated, is also used as a fill guide by lining it up with the graduations. 1.1C, Examples of different sizes of syringes and their corresponding graduations.

INSTRUMENT Automatic Dose Syringe



■ **Function**

To administer intramuscular (IM) or subcutaneous (SQ) injections to multiple animals without reloading the syringe.

◆ **Common Name**

Automatic syringe

■ **Characteristics**

A syringe barrel is attached to a handle with a dial that can be set to

deliver 1 to 5 mL at a time with a squeeze of the handle. Care must be taken to clean the syringe thoroughly to prevent drug interactions and to prevent the spread of disease. The rubber gaskets inside the syringe need to be oiled with mineral oil to keep them pliable.

INSTRUMENT Vetamatic

Dose Syringe



● **Function**

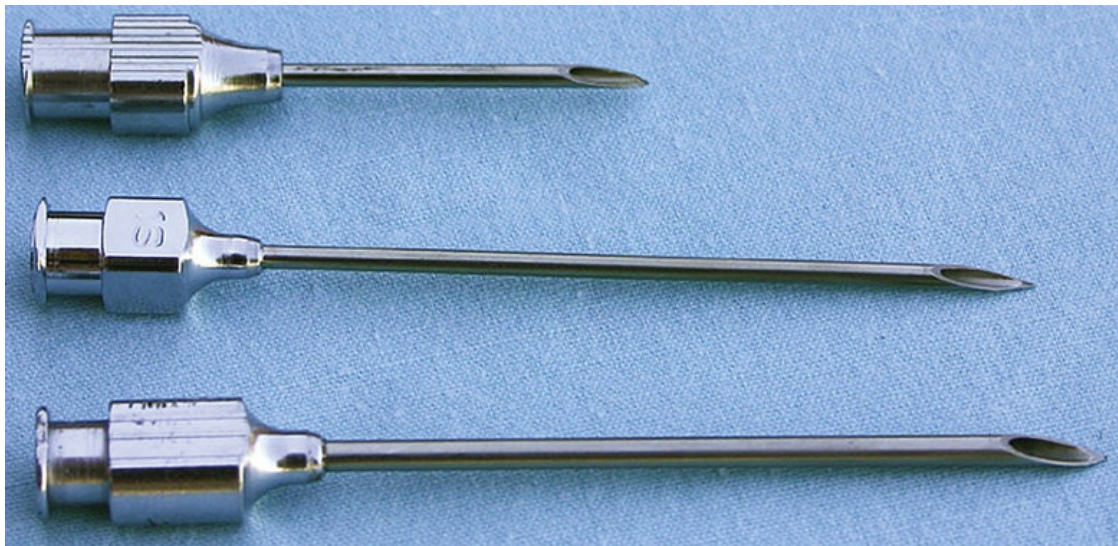
To administer IM or SQ injections to multiple animals with automatic reloading of the syringe.

■ **Characteristics**

This syringe has an attachment for a hose that is connected to a tankard or to a collapsible bottle. When the plunger is pushed in, the medication or vaccine is delivered; when the plunger is released, it draws in the preselected amount from the tankard or

bottle.

INSTRUMENT Stainless Steel Hypodermic Needle



• **Function**

To deliver parenteral medications.

• **Common Name**

Needle, nondisposable needle, stainless steel needle, bleeding needle

■ **Characteristics**

Stainless steel needles come in a variety of lengths and gauges. The most common sizes are 14-, 16-, and 18-gauge needles at 1 1/2 inches to 3 inches in length. The advantage of these needles is that they can be used again after sterilization. The disadvantages are that they lose their sharp edge and must be sharpened manually and that if improperly sterilized, they may spread diseases such as malignant catarrhal fever, warts, and leukosis.

INSTRUMENT

Hypodermic Needles



■ Function

To inject parenteral medications.

◆ Common Name

Needles

■ Characteristics

Stainless steel shafts have plastic or aluminum hubs. They come in a variety of lengths and gauges. The following is a list of gauges,

from smallest lumen size to largest, and their general uses. Different name brands have different-colored covers; it is advisable to learn these colors so that in an emergency situation, identification can be made quickly.

► **25- to 30-Gauge Needles**

Needles of these sizes are usually used on very small animals: birds, reptiles, pocket pets, kittens, and puppies. They can also be used for intradermal injections, for tuberculosis and allergy testing, and for the delivery of local anesthetics. The lengths of these needles are usually less than 1 inch and range from 1/2 inch to 5/8 inch.



23- and 22-Gauge Needles

Needles of these sizes are usually used for general injections in dogs and cats. The 22-gauge needle is the standard size found in

most clinics and is used for injections and for drawing blood. The lengths of these needles usually range from 5/8 inch to 1 inch, but 1 1/2-inch needles can also be found.

▶ **20-, 19-, and 18-Gauge Needles**

Needles of these sizes are usually used in large dogs such as Great Danes and Saint Bernards and in sheep, goats, cattle, and horses. Those used in larger animals may be as long as 1 1/2 inches, as opposed to the standard 1 inch.

▶ **16- and 14-Gauge Needles**

These two needles are not used frequently; however, they can be found in most large or mixed animal clinics. They are useful for delivering large volumes of intravenous (IV) fluids quickly. They are also useful when a very thick substance must be injected and the patient is uncooperative.

Syringe



• Function

To administer liquid medications orally.

• Common Name

Drenching syringe, drencher

■ Characteristics

A stainless steel syringe is marked in ounces (oz.) and milliliters (mL) on the plunger shaft; it can be used to give multiple animals an oral dose of medication by pushing in the plunger. Interchangeable nozzles are selected per the animal being medicated.

INSTRUMENT Dose-Syringe Nozzle Ends



■ **Function**

To reach down the esophagus of a large animal.

■ **Characteristics**

These nozzles come in a variety of lengths, widths, and angles to facilitate the delivery of oral medications.

INSTRUMENT Drench-Matic Dose Syringe



● **Function**

To administer oral liquid medications without multiple reloading of the syringe.

■ **Characteristics**

The syringe has a hose that goes to a tankard; with each squeeze of the handle, the exact amount of medication is delivered orally. Note the oral nozzle attached to the barrel, this can be exchanged for different sizes per animal species.

INSTRUMENT

Oral Calf Drencher



■ Function

To give large amounts of oral fluids to calves, foals, or lambs.

◆ Common Name

Calf drencher, oral drencher, calf bag

■ Characteristics

A large reservoir bag ends in a drenching wand. The wand is passed into the esophagus, and gravity causes the bag to empty.

INSTRUMENT Stomach Tube



■ **Function**

To deliver liquid medications directly to the stomach via the esophagus; also used to relieve gas from the rumen in cases of moderate bloat.

■ **Characteristics**

Long red rubber or polypropylene tubes come in a variety of diameters and lengths. Inside diameters and lengths are 1/4 inch × 7 feet, 5/16 inch × 9 feet, 3/8 inch × 9 feet, and 1/2 inch × 10 feet.

Pump



• Function

To pump medication through the stomach tube into the stomach.

• Common Name

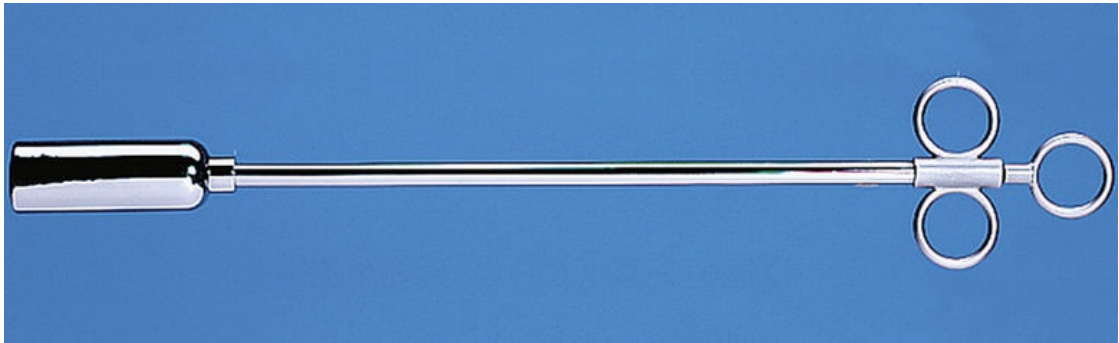
Stomach pump

■ Characteristics

A stainless steel pump with a handle at the top performs the pumping; an adapter for the stomach tube can be attached to the

pump. Once the tube is in place, it is attached to the pump. The operator pulls the handle up to load the pump and pushes it down to deliver the medication through the tube.

Gun



■ Function

To deliver solid medication to large animals orally.

■ Characteristics

A plunger reaches through the shaft of the instrument and ends in a flared receptacle for a pill or bolus. Some guns have springs inside the receptacle to hold the bolus in place. The gun is pushed down the throat, and once past the esophageal groove, the plunger is pushed to send the bolus the rest of the way down the esophagus. The receptacle comes in 5/8-inch, 7/8-inch, and 1-inch diameters. Some models have interchangeable heads that screw on and off.



• Function

To deliver solid medication to small animals orally.

• Common Name

Pilling gun

■ Characteristics

A plunger reaches through the shaft of the instrument and ends with a flared receptacle for pills. It is a small version of the balling gun.

INSTRUMENT **Pill-** **Counting Tray**



■ **Function**

To count out a number of pills without touching them with the bare hand.

■ **Characteristics**

A flat spill tray is attached to a trough with a cover. The pills are spilled onto the tray, and as they are counted out they are pushed into the trough. Once the proper number to fill the prescription is in the trough, the cover is closed. One corner of the tray is an open funnel that allows the excess pills to be put back into the bottle. The opposite corner has an opening at the cover end of the trough; this allows the counted pills to be put into a dispensing envelope or

bottle to send home with the client.

Splitter



• Function

To split tablets accurately for appropriate doses.

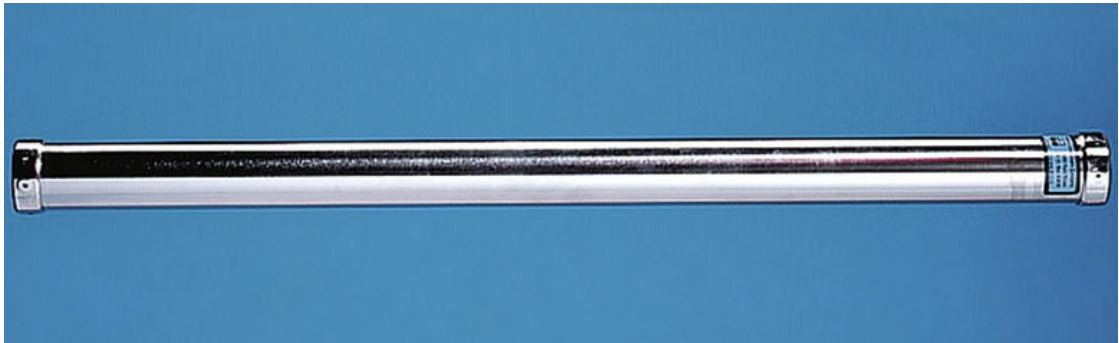
■ Characteristics

A square or a round plastic holder allows one pill to be placed in a wedge-shaped groove. The lid on the holder contains a razor blade that, when the lid closes, cuts the tablet in half or in quarters.

INSTRUMENT

Frick

Speculum



• **Function**

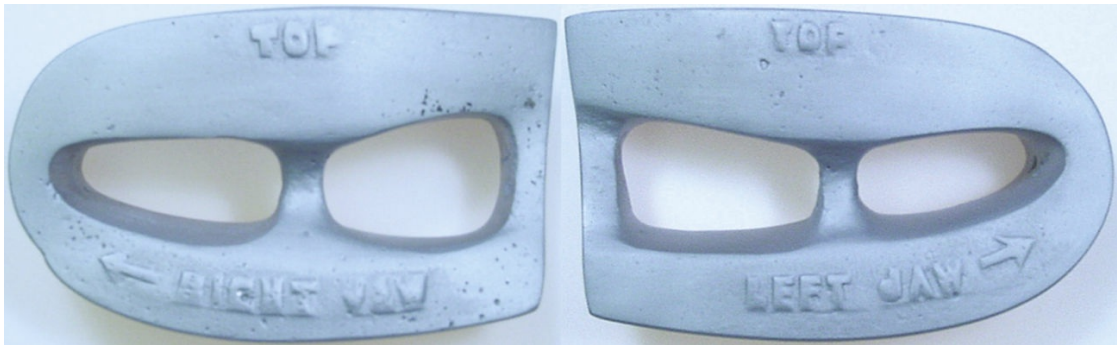
Used on large animals to hold the jaws open wide enough to enable the passage of the stomach tube down the throat.

■ **Characteristics**

A stainless steel tube that is approximately 19 1/2 inches long.

INSTRUMENT

Drinkwater Speculum



• Function

To hold the mouth open to pass a stomach tube.

■ Characteristics

A flat bar with a hole large enough to accommodate a stomach tube, balling gun, or drench syringe is placed into the mouth. This can be used in cattle, sheep, and goats; the smaller version can be used in small animals.

INSTRUMENT **Bayer**

Mouth Speculum



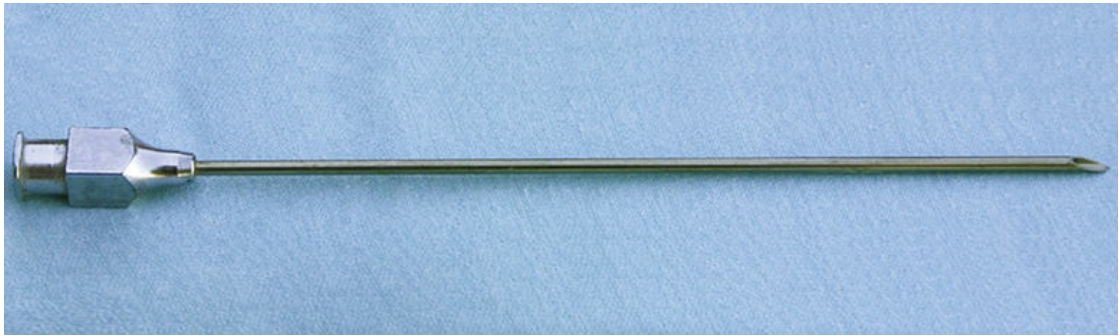
■ **Function**

To hold the mouth open for dental examination and treatment.

■ **Characteristics**

A triangular wedge is made of metal and usually has a handle that is used to hold the speculum in place during the examination. The wedge runs the length of the molars.

INSTRUMENT 4-Inch 18-Gauge Swine-Bleeding Needle



• **Function**

To draw blood from the anterior vena cava of a pig.

■ **Characteristics**

A 4-inch stainless steel needle with a standard hub. The needle must be cleaned or at least rinsed soon after use because blood clots inside the needle lumen, make it unusable.

INSTRUMENT 4-Inch 18-Gauge Spinal Needle



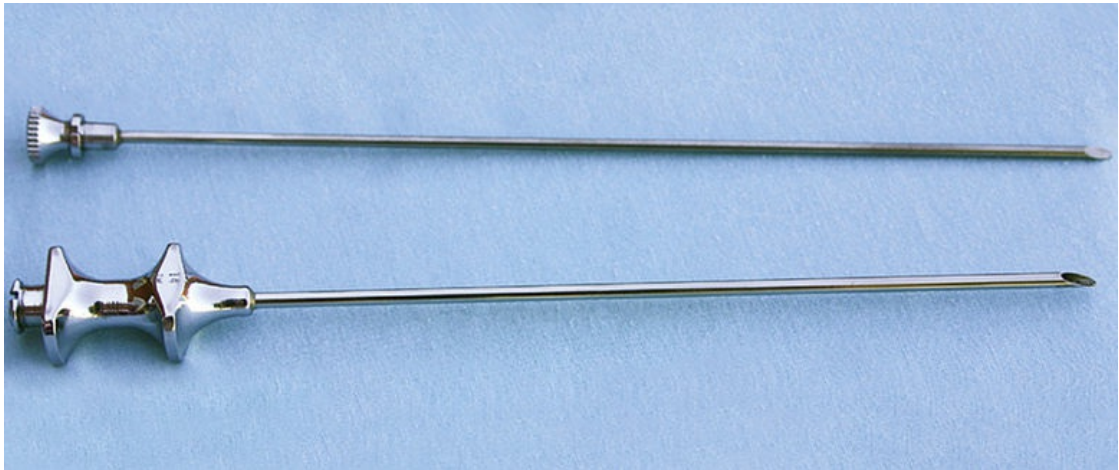
■ **Function**

To perform aspiration biopsies and drainage procedures.

■ **Characteristics**

This needle has a shorter bevel length than does a standard needle; it also has a matched ground bevel that eliminates the possibility of tissue coring.

INSTRUMENT Modified Silverman Biopsy Needle



● **Function**

To perform biopsies.

■ **Characteristics**

A small handle facilitates the introduction of the needle; a stylet prevents premature coring.

INSTRUMENT Bone Marrow Biopsy Needle



■ **Function**

To perform biopsies of the marrow, not the bone.

■ **Characteristics**

This needle has a large handle that facilitates the introduction of the needle through bone. It also has a stylet to prevent tissue coring.

INSTRUMENT Bone Marrow Intraosseous Needle



■ **Function**

To perform intraosseous infusion in small animals or birds. It can be used on animals that are hypovolemic, which makes finding a vein difficult.

■ **Characteristics**

An over-the-needle cannula can be left in place once the needle is withdrawn. The most common spot for the introduction of this needle is the proximal femur.

Needle



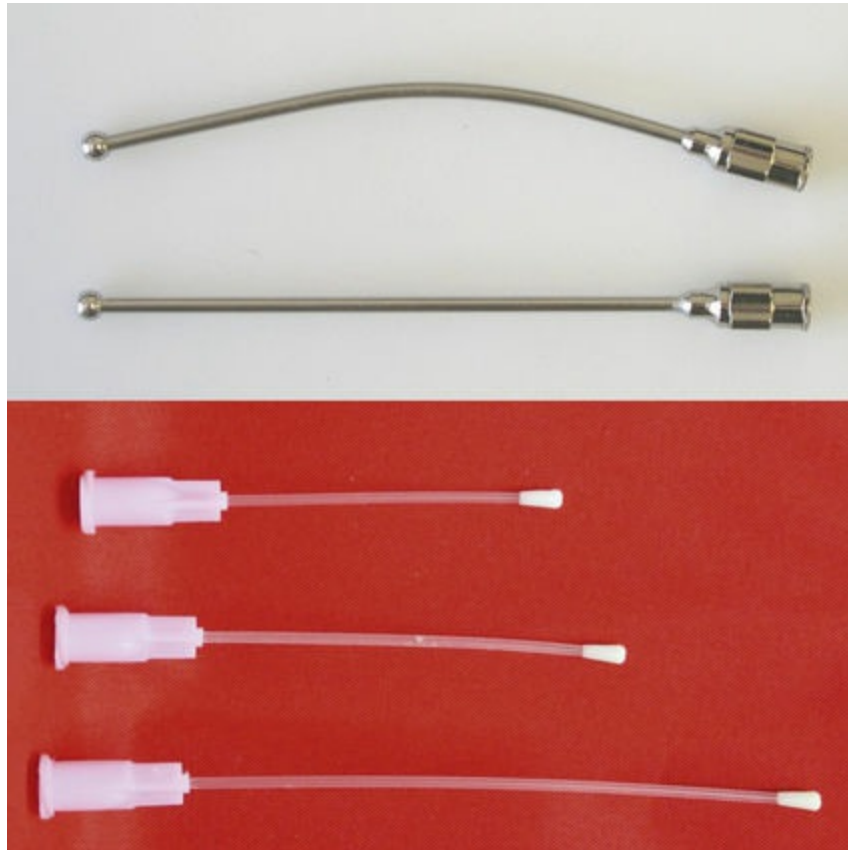
• Function

To transfer the liquid contents of one bottle to another without the use of a syringe.

■ Characteristics

The double-ended needle can aseptically pierce the rubber stoppers on the bottles.

INSTRUMENT Feeding and Dosing Needles



● **Function**

To stomach-feed small animals, such as rodents, birds, and reptiles.

◆ **Common Name**

Gavage needle, dosing needle, flushing needle

■ **Characteristics**

The needles have blunted, round tips that can be inserted into the esophagus to deliver nutrients, washes, or medications directly to

the stomach. They are usually 2 to 3 inches long and are either straight or curved. There are new flexible dosing needles that have multiple uses.

CHAPTER 2

Diagnostic Instruments



This chapter covers instruments that assist in the general evaluation of patient health status.

INSTRUMENT

Ophthalmoscope



■ Function

To view the external and internal structures of the eyeball.

■ Characteristics

The head of the ophthalmoscope has one dial that controls the amount and shape of the light and another dial that controls the depth of penetration. Many handles can be used interchangeably with an otoscope head. The handles can be battery operated or can be plugged in to be recharged. The user turns on the light by depressing the red button and turning the black dial.

INSTRUMENT

Otoscope



■ **Function**

To view the internal structures of the ear canal and eardrum.

■ **Characteristics**

The head of an otoscope has a light source and cones of varying lengths and diameters that fit inside the ear canal. The cones can be changed by being slipped into the ring receptacle. To control the light, the user depresses the red button and turns the black dial. Many otoscopes have a magnifying glass to assist viewing. With the attached otoscope cones it can also be used to illuminate the vaginal vault in female dogs and cats.

INSTRUMENT

Stethoscope



■ Function

To auscultate the heart, lungs, and digestive organs.

■ Characteristics

A head is equipped with a single or dual bell covered by a tight plastic membrane that is attached to a long rubber tube that ends in earpieces. If the head has dual bells, the user can engage one or the other by simply turning the bell in a circular motion. The bells allow for auscultation of high- and low-frequency noises.

INSTRUMENT

Thermometer: Mercury; Small and Large Animals



■ Function

To determine the body temperature of an animal.

■ Characteristics

A glass tube is filled with mercury and has graduations from 94°F to 110°F on large-animal thermometers and 96°F to 105°F on small-animal thermometers. The small-animal thermometer is usually 4 inches long; the large-animal thermometer is 5 inches long and is topped by a ring. The ring allows the user to attach a string and a clip that, in turn, is attached to the hair on the tail of a horse or cow. This prevents the thermometer from falling to the ground if the animal defecates. Both thermometers are inserted into the rectum for approximately 2 minutes to obtain an optimal reading.

INSTRUMENT

Thermometer: Digital



■ Function

To determine the body temperature of an animal.

■ Characteristics

Housed in plastic and equipped with a small window that displays the temperature, this thermometer has a long skinny tip that can be inserted easily into the rectum. Most of these thermometers beep when they have achieved their readings. When compared with the reading of a glass thermometer, that of a digital thermometer can vary by a degree or two, so checking it against the reading of a glass thermometer is advisable. If a wide range of readings is found in an animal assumed to be healthy, the thermometer's batteries may be low and should be replaced.

INSTRUMENT

Thermometer: Aural (Vet Temp)



• Function

To determine the body temperature of an animal.

■ Characteristics

A small animal's temperature is taken by placing a short probe into the ear canal. This method is fast and seems to be accurate. Again, the user should watch for signs that the batteries are getting low.

INSTRUMENT Taylor

Percussion Hammer



• Function

To perform a neurologic exam.

■ Characteristics

A triangular rubber hammer is used to strike nerve points gently and judge the animal's reaction.

INSTRUMENT Vaginal Speculum—Killian



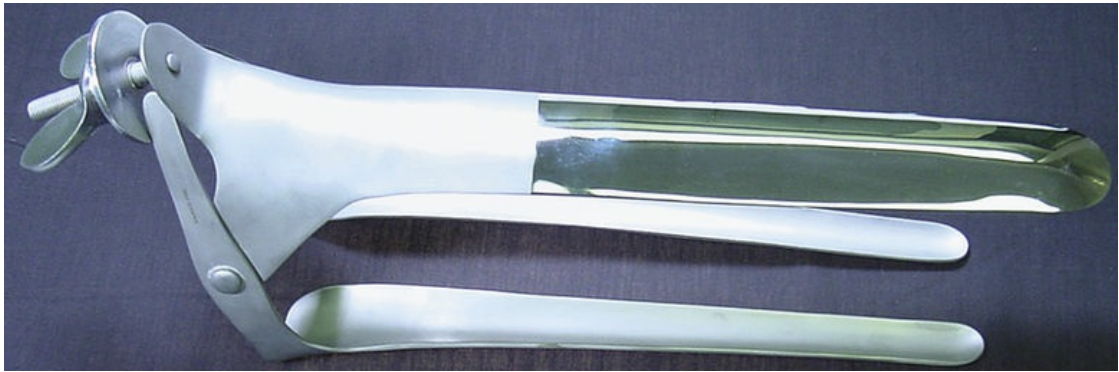
■ **Function**

To hold open the labia so the vaginal vault can be viewed, swabs taken, and medication delivered to the uterus. It can also be used during the urinary catheterization of a female.

■ **Characteristics**

Tapering jaws can be opened by squeezing the handles. A screw set at the top of the handles is turned to keep the jaws open.

INSTRUMENT Vaginal Speculum—Polansky Canine



■ **Function**

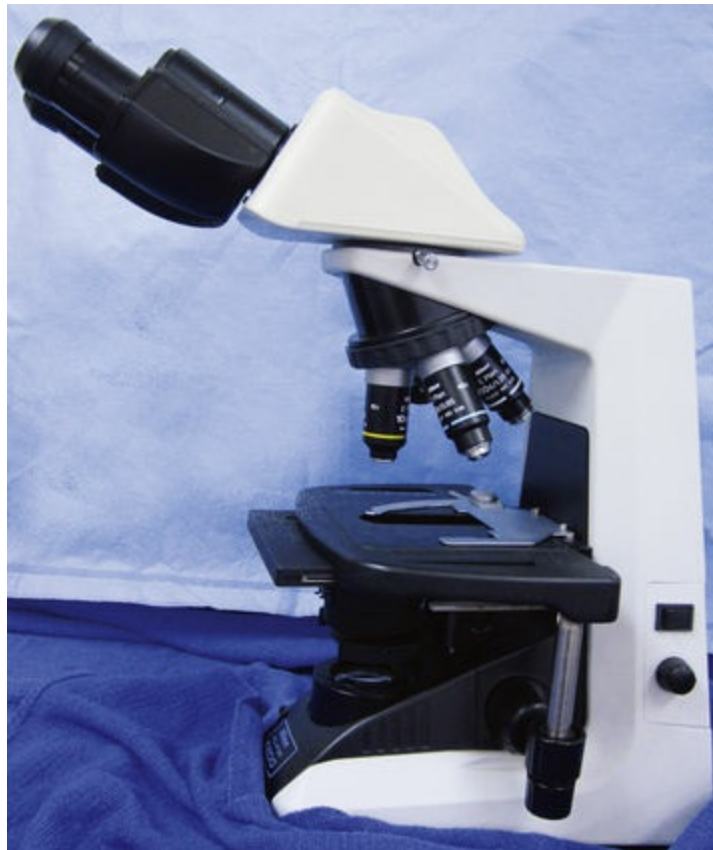
To hold open the labia so the vaginal vault can be viewed, swabs taken, and medication delivered to the uterus. It can also be used during the urinary catheterization of a female.

■ **Characteristics**

Larger than the Killian speculum, the Polansky speculum is opened by squeezing the handles and can be locked into place by turning the knob. This instrument is too big for most small animals; it is used in large animals.

INSTRUMENT

Microscope



■ Function

An instrument used to magnify minute objects.

■ Characteristics

The binocular microscope shown has four objectives that magnify objects by 4×, 10×, 40×, and 100× the power of the ocular, which is usually 10×. This means that an object under 4× is magnified by $4 \times 10 = 40$ times, all the way up to $100 \times 10 = 1000$ times. The 100× is used with oil immersion to clarify the object. Bacteria, blood, and tissue cells are usually looked at under 100×.

Light



• Function

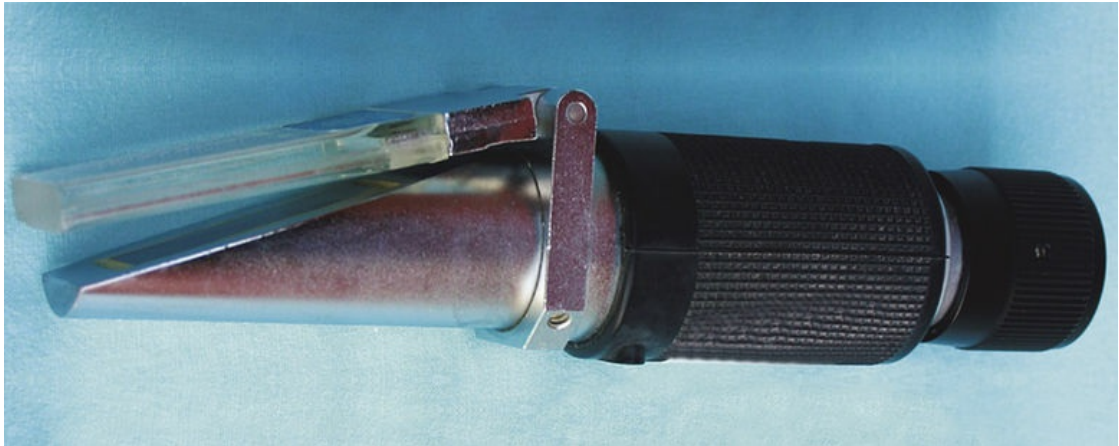
To confirm or rule out the possibility of ringworm infection.

■ Characteristics

An ultraviolet light is held over the animal's coat. If areas of apple-green fluorescence are seen, the possibility of ringworm exists and a culture should be taken.

INSTRUMENT

Refractometer



● Function

To measure total solids in plasma and specific gravity in urine.

■ Characteristics

An eyepiece is attached to one end, and a glass pad with a plastic cover is on the other end. The user fills the glass pad and reads the scales, which can be viewed through the eyepiece.

INSTRUMENT

Differential Cell Counter



• Function

To aid in the counting of the white and red blood cells, platelets, and sperm.

• Common Name

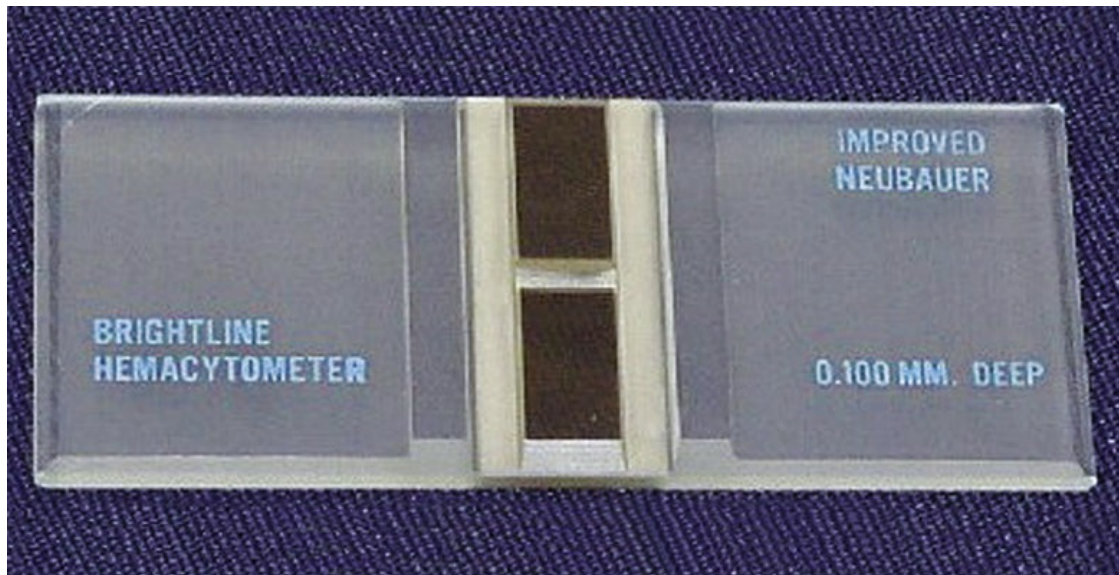
Cell counter

■ Characteristics

A five- or seven-button tally counter is labeled with the various types of blood cells seen on a differential. As the user finds each cell on the slide, the appropriate button is pushed; each push counts as one cell. A bell rings when 100 cells have been counted.

INSTRUMENT

Hemocytometer



• Function

To aid in the counting of white and red blood cells, platelets, and sperm.

■ Characteristics

This glass instrument is etched with grids and has two fill apertures. A grid or a combination of grids is used to count the cells or sperm.

INSTRUMENT

Fecalyzers



■ Function

To set up a fecal test for the presence of parasites.

■ Characteristics

A small receptacle is filled with feces; a tube is placed on top and filled with fecal solution. The feces and solution are mixed thoroughly, then filled to the brim. A coverslip is placed on top of the filled tube and allowed to rest for a minimum of 10 minutes. The parasite eggs float to the top and adhere to the coverslip.

INSTRUMENT

Centrifuge



■ Function

Equipment used to separate different components from body fluids.

■ Characteristics

All centrifuges spin at various speeds creating centrifugal force, which pushes the heavier components to the bottom of the sample tube. (A) Centrifuge (*left*) is used for hematocrits that use small thin glass tubes. Centrifuge (*right*) is a StatSpin and also uses small tubes that are ideal for bird and rodent samples (page 92). (B) The orange SeroSpin will accommodate 3-mL vacuum tubes. (C) This is a “fixed head” centrifuge, meaning the tubes do not move. (D) This is a “slant head” centrifuge, meaning the tubes swing out with the centrifugal force. Both (C) and (D) will accommodate 15-mL test tubes and have either plugs or interchangeable racks that will hold

3- to 5-mL tubes as well.



abcd

CHAPTER 3

Instruments for Small Animals



These instruments are used when caring for and treating small animals.

INSTRUMENT

Tourniquet



• Function

To occlude a blood vessel so a venipuncture can be performed. It can also be used as a temporary muzzle.

■ Characteristics

A rubber or nylon tube is held together by a clip. The tourniquet is tightened around the leg or muzzle by pulling on one end of the tube. It is released by pulling on the clip.

INSTRUMENT White Nail Trimmer



■ **Function**

To trim a small animal's toenails when they have curved around to the extent of being nearly circular.

◆ **Common Name**

Whites

■ **Characteristics**

This scissorlike instrument has jaws that are bowed so that it can accommodate the circular nail.

INSTRUMENT Guillotine Nail Trimmer



■ **Function**

To trim the toenails of small animals.

◆ **Common Name**

Resco

■ **Characteristics**

A guillotine-like blade slides to slice the nail as the handles are squeezed. Care must be taken to hold the trimmer parallel to the pad so the nail is not cut too short.

INSTRUMENT

Nail

Scissors



Large nail scissor



Small nail scissor

Function

To trim the toenails of small animals.

Common Name

Nail trimmer

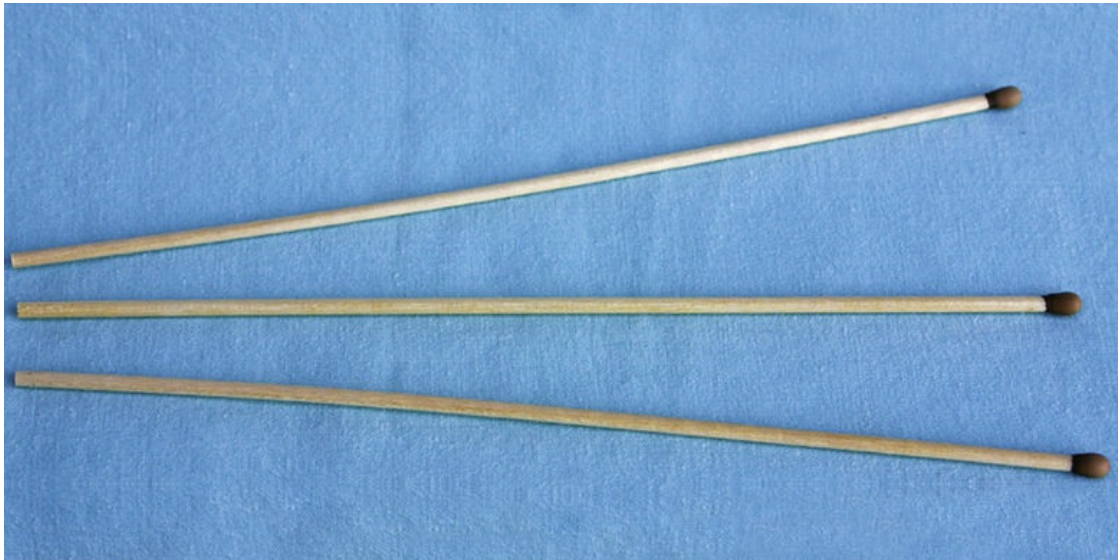
Characteristics

This trimmer is designed much like the White nail trimmer, except that the handles are more substantial on the larger scissors. The trimmers come in a wide variety of sizes, from very small for birds and cats to very large for big dogs.

Note

Many have a blade depth guide that swings over the hole to

prevent the operator from removing too much toenail at a time.

Nitrate Stick**• Function**

To stop bleeding from a blood vessel.

■ Characteristics

A small shell of silver nitrate is affixed to a wooden applicator stick. The silver nitrate is applied directly to small blood vessels to cauterize them; this stops the bleeding. Care should be taken not to get wet silver nitrate on skin or clothes because it stains.

Syringe



• Function

To deliver cleansing solutions to the ear canal. It can also be used to flush wounds.

• Common Name

Bulb syringe

■ Characteristics

A rubber bulb ends in a tapered tube that can be inserted into the

ear canal or into a wound. It can also be used to suction the nares or oral cavity on newborns. Squeezing the bulb, then releasing, draws solution into the bulb; squeezing again delivers the solution.

INSTRUMENT

Animal Clippers



• Function

To run the clipper blades that shave the hair from an animal's skin.

• Common Name

Clippers

■ Characteristics

This electric clipper has detachable blades that allow the user to shave the hair all the way down to the skin or just to shorten it.

INSTRUMENT Clipper Blades



■ Function

To shave the hair from an animal's skin.

■ Characteristics

Blades of varying lengths either remove the hair completely or leave the hair as long as 2 to 4 inches. The blades most commonly used in veterinary medicine are the #40, which removes all of the hair for the purpose of surgical preparation and for venipunctures, and the #10, which leaves approximately 1/4 inch of hair and is used to remove matted hair from long-haired animals.

► **Caution**

Using a blade with missing teeth or tipping the blade up too far on the animal can cause painful gouges in the skin.

INSTRUMENT Rabbit- Bleeding Box



● **Function**

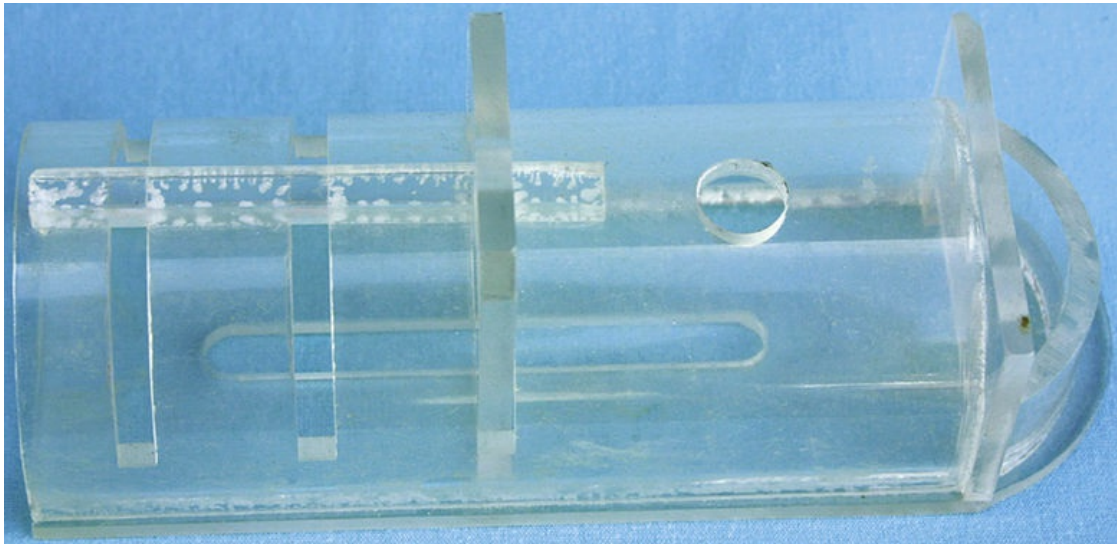
To hold a rabbit securely so that a venipuncture may be performed on the ear.

■ **Characteristics**

Usually made of plastic, this box is equipped with a head gate that can be adjusted to fit securely around the rabbit's neck and a tail gate that squeezes the rabbit in tightly so it cannot kick and possibly break its back. The top panel opens wide to allow easy

insertion of the rabbit. The floor is grated to enable easy cleanup.

INSTRUMENT Mouse- and Rat-Restraint Chambers



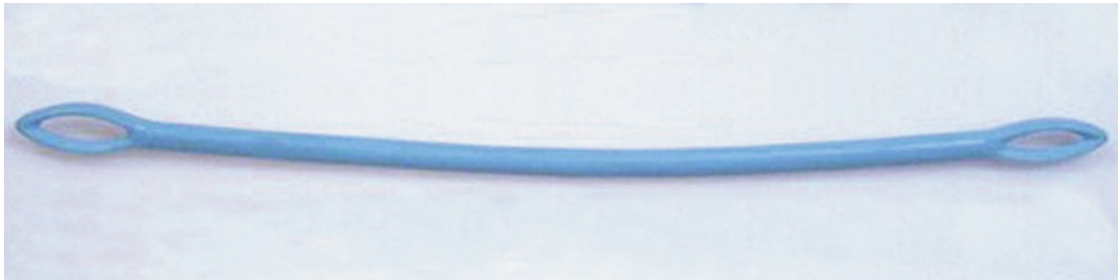
● **Function**

To hold a mouse or rat securely so that a parenteral injection may be administered.

■ **Characteristics**

This plastic tube is equipped with numerous holes and slots that allow access to most body parts for intravenous, subcutaneous, and intramuscular injections. The difficulty involved with this chamber is getting the rodent into it.

Loop



• Function

To retrieve a sample of feces from the rectum.

■ Characteristics

A long plastic shaft ends in a loop at each end. The end is lubricated and gently inserted into the rectum, where the loop gathers any fecal material present. This allows a fecal test to be run without waiting for nature to call. The standard loop is $3/8 \times 9$ inches long; the puppy/kitten loop is $1/4 \times 4 3/4$ inches long.

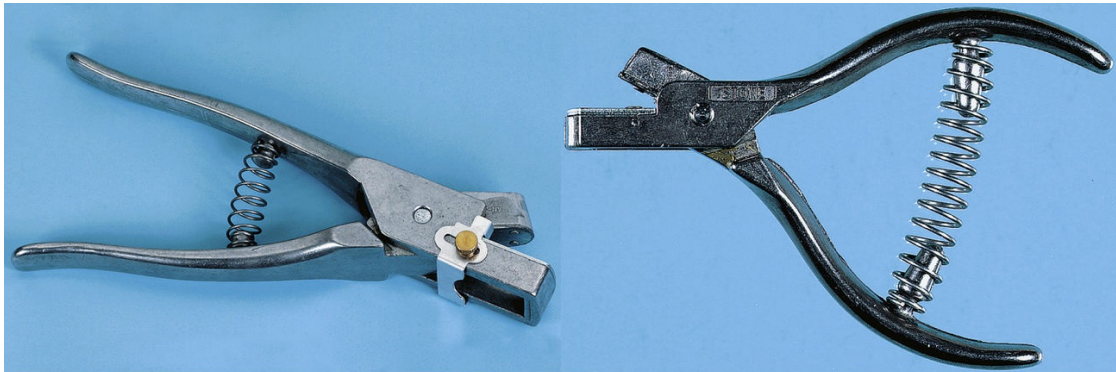
CHAPTER 4

Instruments for the Identification of Animals



These instruments provide the user with a means of permanently or temporarily identifying animals.

Notcher



Rounded

Wedge

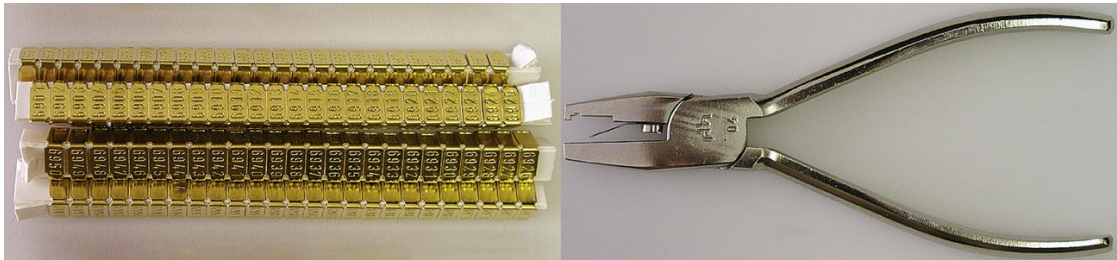
• Function

To make permanent identifying marks in the ears of pigs, goats, and sheep.

■ Characteristics

One jaw of this instrument has a sharp blade that punches a hole or makes a notch; the other is a solid block. The pinna is placed between the jaws of the notcher. When it is squeezed, a piece of tissue is removed from the pinna. The resulting hole or notch is placed around the edge of the pinna and indicates a particular number based on the position and left or right ear. The size of the notch at its base varies from $\frac{5}{16}$ to $\frac{1}{2}$ inch. A notch of $\frac{13}{16}$ can be a V, an inverted U, or a round hole.

INSTRUMENT Hauptner Mouse-Ear Identification Tag and Applicator



■ **Function**

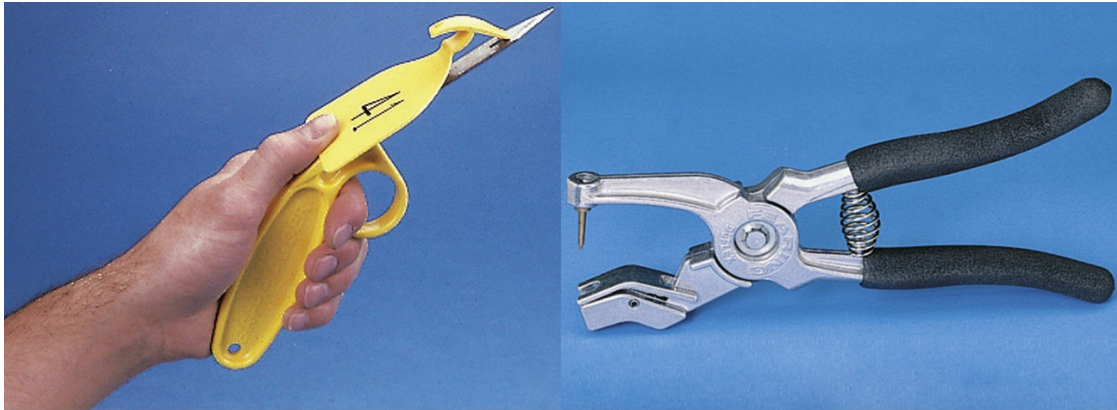
To identify a particular rodent with a numbered tag.

■ **Characteristics**

A small tag bearing an identification number is attached to the ear of a mouse or rat when the handles of the applicator are squeezed.

INSTRUMENT

Identification-Tag Applicator



Tag applicator

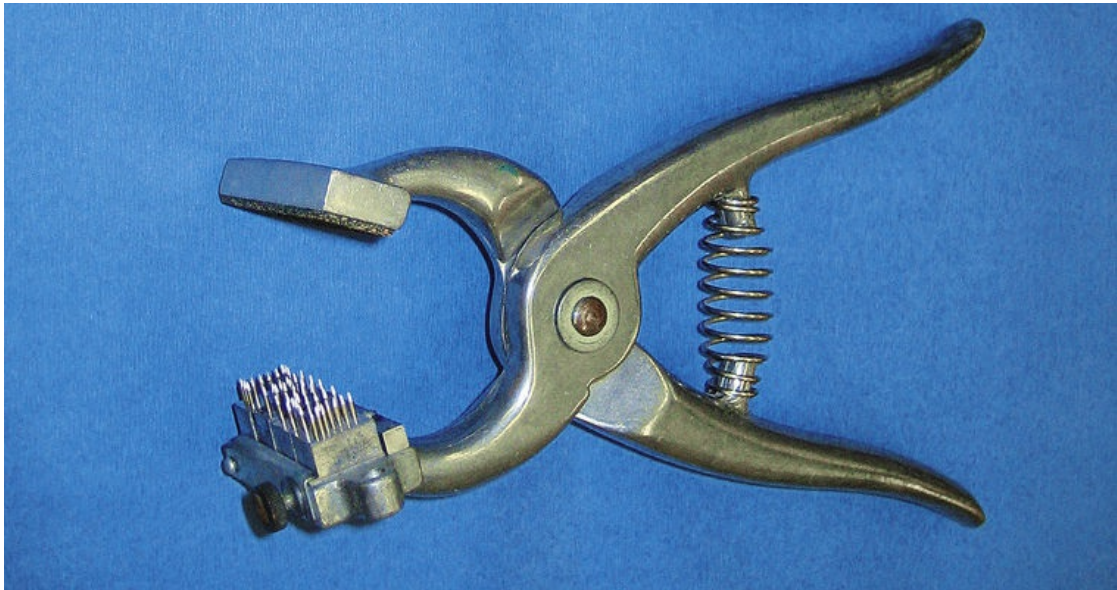
Tag applicator

■ Function

To apply ear tags to cattle, sheep, and goats.

■ Characteristics

These taggers come in a variety of versions. Their purpose is to attach some form of ear tag. Most involve a puncturing device onto which the tag is threaded; the other jaw of the applicator is fitted with the back of the tag (much like a human's post-style pierced earring), which is designed to keep the tag in the ear. The tag is placed into the ear so that it faces forward. This is not a permanent form of identification because the tags can be ripped from the ear.

Outfit: Manual**• Function**

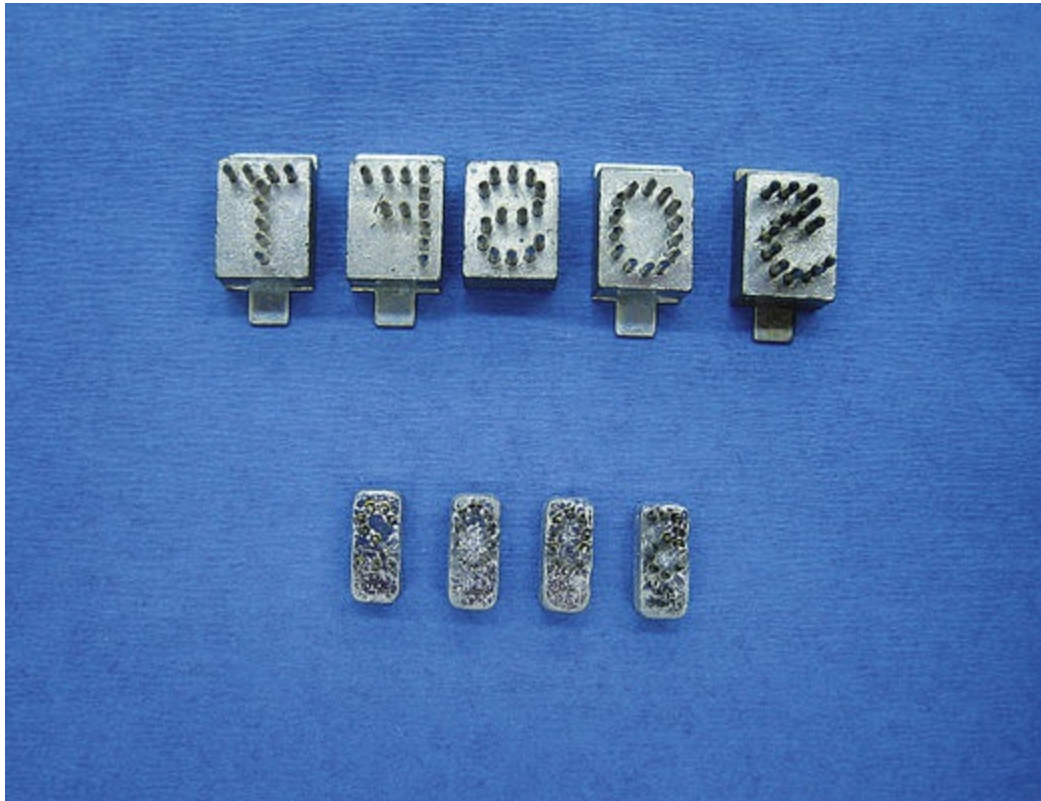
To identify an animal permanently by placing numbers or letters inside the ear, lip, or thigh.

■ Characteristics

One jaw of the instrument is designed to hold three to five digits or letters; the other has a padded block. The body part is placed between the jaws of the instrument, and the handles are squeezed with enough pressure to puncture the skin. Tattoo ink is then rubbed into the resulting holes. Large- and small-animal tattoo outfits are available. Reasons for tattooing include verification of brucellosis vaccination and identification of a specific purebred animal.

INSTRUMENT Tattoo

Letters and Digits



■ Function

To be used with the tattoo outfit to make punctures for permanent identification.

■ Characteristics

Each letter or digit is outlined with sharp spikes on a metal block. The blocks are placed on the jaw of the tattoo outfit and are secured into place by a gate. The letters and digits come in a variety of sizes, from $\frac{3}{8}$ inch for large animals to $\frac{5}{16}$ and $\frac{1}{4}$ inch for small animals.



● **Function**

To be used with the tattoo outfit to make the punctures permanently visible.

■ **Characteristics**

This indelible ink is placed on the puncture site. The punctures are made, and more ink is applied by the operator, using a finger or a soft brush. The ink has to be worked into the punctures; otherwise it will fade. The ink is available in paste or in liquid form in a roller bottle. The colors available are black, red, green, and white.

INSTRUMENT Tattoo

Outfit: Electric



● Function

To identify an animal permanently by placing numbers, letters, or designs inside the ear, lip, or thigh.

■ Characteristics

This outfit operates much like a pen. It has a small motor that moves a needle up and down; the needle is used to puncture the skin in any manner the operator wishes. The ink is applied as the punctures are made or, in some models, after the punctures are

made.

INSTRUMENT

Hot-Iron Branding Irons



■ Function

To identify an animal permanently by placing numbers, letters, or designs on the animal's shoulder or hip.

◆ Common Name

Branding irons

■ Characteristics

These irons are made of heavy-duty copper and are available in letters, numbers, and custom designs. The handles are 32 inches long. The irons are heated in a propane heater until they are red-hot. The iron is quickly placed against the skin in the body area registered for that particular herd. The iron is held in place until the

operator is sure that the skin has been burned. The resulting scar is a permanent mark.

INSTRUMENT Electric Branding Irons



■ **Function**

To identify an animal permanently by placing numbers, letters, or designs on the animal's shoulder or hip.

◆ **Common Name**

Electric brander

■ **Characteristics**

This iron has its own heating element in the handle. The brand can

be single numbers, letters, or designs, or it can be a series of bends and curves that, when used together, form numbers, letters, or designs. The disadvantage of these irons is that a power source is necessary.

INSTRUMENT **Freeze**

Branding Irons



Freeze branding iron

Freeze brand showing pigment loss

■ **Function**

To identify an animal permanently by placing numbers, letters, or designs on the animal's shoulder or hip.

◆ **Common Name**

Freeze brander

■ **Characteristics**

These irons are super-cooled by liquid nitrogen or a combination of dry ice and alcohol. The irons are placed on the animal's hide, and they kill the pigment-producing cells. The returning hair growth is white, making the mark permanent. The only disadvantage of this method is that it takes approximately 3 months for the hair to grow back.

INSTRUMENT Marking

Paint



● Function

To mark an animal temporarily.

● Common Name

Paint stick

■ Characteristics

These biodegradable, nontoxic products are designed to be applied to an animal as it is being medicated, vaccinated, or otherwise processed, so as to prevent duplicate administrations. The paints wash or wear off over time. They are available in aerosol sprays, liquid paints, and paint sticks. There is even a paintball gun that can be used to mark an individual in a pasture or a large group without getting near the animal

INSTRUMENT Microchip Implanter



■ **Function**

Device used to insert an identification microchip into a pet.

■ **Characteristics**

This large-bore needle and syringe-like instrument comes loaded with a microchip that has a unique number. The chip is commonly placed under the skin directly over the shoulder blades on the top line of the animal. It is important to pinch the insertion point as the needle is being withdrawn, because on occasion the microchip is dragged out. By pinching over the hole, it will ensure the microchip stays under the skin.

INSTRUMENT Microchip Reader



● Function

This device verifies the placement of a microchip under the skin on a pet.

■ Characteristics

The microchip reader is used to find and read the microchip under the skin. It can be specifically for a particular brand of microchip, or it can be a universal one that will read almost all microchips. It is used by pressing and holding down the large button as it is passed

over the animal, starting at the shoulders and then down on both legs and under the chest, then over the back and down and around the abdomen. The chip tends to migrate and can be found pretty much anywhere on the body! If a chip is found, it will beep and display the number and brand.

CHAPTER 5

Instruments Used for Bovines



This group of instruments is used to restrain, treat, and care for cattle.

Halter



• Function

To control an animal's head while the animal is in a chute or while it is being led.

■ Characteristics

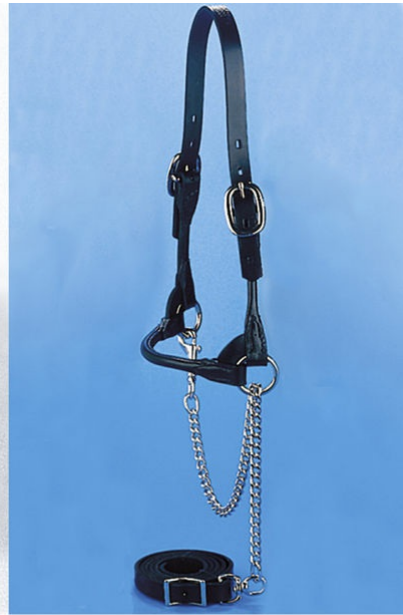
This is an adjustable halter. The headstall can be lengthened and the noseband made wider by pulling the lead rope through a series of loops. The noseband is tightened by pulling on the lead rope. This is an important distinction because, if the noseband is placed around the animal's neck, it can become a choking hazard; in addition, it does not provide good control of the head. When the halter is placed on the head properly, the end of the lead rope should be on the left side of the animal's cheek. These halters are

made of round plastic, polyethylene, nylon, or sisal ropes. They come in sizes that fit adults and calves and are used for routine work, such as jugular venipuncture, drenching, surgical procedures on the head, and teaching a show animal how to walk on lead.

Show Halter



Show halter without lead



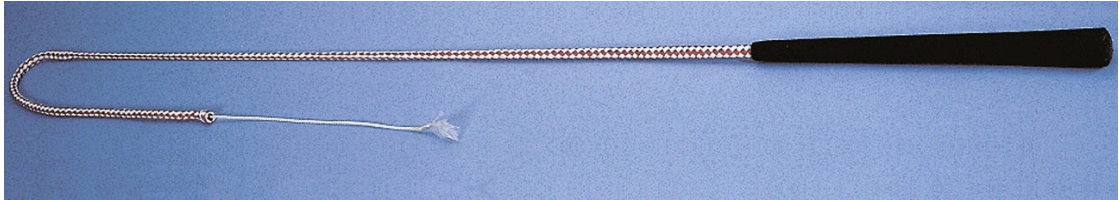
Show halter with chain shank

■ Function

To lead cattle in a show.

■ Characteristics

The headstall and noseband are held in place by a chain shank that is slipped under the chin and attached to the bottom of the noseband. The chain shank allows better control of an animal than does a nylon strap. This kind of halter is used only after an animal has been taught to be led using a rope halter.



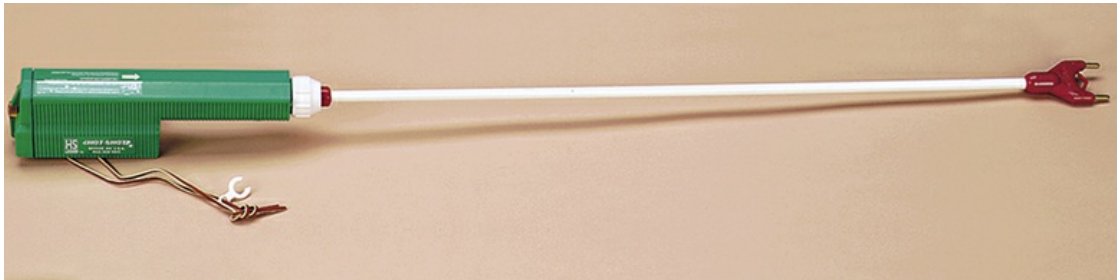
• Function

To make livestock move and to make the handler look bigger.

■ Characteristics

A fiberglass shaft ends in a nylon popper that can be flicked at an animal that is balking or refusing to move. The ideal areas to aim for are the heels or across the buttocks; that makes the animal move forward. The whip can also be extended out to the side of the handler to make it look as though the handler has long arms, which is useful in getting an animal to take a turn. Whips have poppers of varying lengths: a driving whip has approximately a 7-inch popper; a lunge whip, which is used with horses, has a 6-foot popper; and a classic stock whip has a popper that is between 8 and 18 inches long. Some herders tie a small leather strap to the popper for an additional popping sound.

Prods



■ Function

To make livestock move into chutes or alleyways.

◆ Common Name

Hot shot

■ Characteristics

These prods are battery powered so they can deliver an electric jolt to an animal. Proper placement is important. To move an animal forward rather than down, the electrodes should be placed under the tail or anywhere on the vertical surface of the rump. An animal can be turned if the prod is used on the side of the body or the neck. If the electrodes are placed on the body's top, the animal becomes confused because the only way for it to move is down. This is a fairly rough form of motivation and should be used judiciously.

Chute



■ Function

To secure a cow or bull in place while maintaining access to its head, feet, and rear.

◆ Common Name

Chute

■ Characteristics

Most chutes work on the principle of catching the head with some

type of squeeze mechanism. Lateral movement is prevented by squeezing the walls of the chute together. Access to the rear is facilitated by a gate or bar that is placed across the back legs of the animal. Feet can be examined by lowering the side panels. This is an extremely useful instrument for cattle restraint, especially for beef cattle.

Lead



• Function

To control the head by applying pressure to the nasal septum.

• Common Name

Nose tongs, bull lead, humbug (Canada)

■ Characteristics

Two rounded, smooth balls are situated on curved handles. The balls are placed on either side of the nasal septum and the handles are brought together by a rope or chain and secured to a chute or stanchion. The maximum time for application of this instrument is 20 to 30 minutes; after that, the septum loses feeling and the cow

struggles. The balls should be inspected for protrusions, which can cause cuts in the nasal septum. If the balls are too close together, the circulation is cut off faster. If they are too far apart, the instrument slips off.



● **Function**

To control the head of a bull by applying pressure to the nasal septum on a semipermanent basis.

◆ **Common Name**

Nose ring

■ **Characteristics**

The ring is surgically placed in the nasal septum. As the tissue heals, the ring must be turned continually to prevent the tissue

from adhering to the ring. Once healing has taken place, staffs with clips on one end are attached to the ring, and, with the aid of a halter, the bull is led around "by the nose." The rings are available in brass or polished steel. When the bull is no longer of service, the ring can be removed before the animal goes to market.

INSTRUMENT Lariat with Quick-Release Honda



■ **Function**

To capture an animal by the neck or feet.

◆ **Common Name**

Lariat

■ **Characteristics**

Lariats are nylon, nylon-polyester blend, or silk sisal ropes that are between 30 and 35 feet in length. They end in a honda (burner), a Turk's head knot, or a quick-release honda, which holds the loop open. The quick-release honda is a metal device; once the animal has been caught and secured, the loop can be opened by releasing

the clasp that holds it together. The honda and the Turk's head knot have to be pulled along the rope for the loop to be opened.

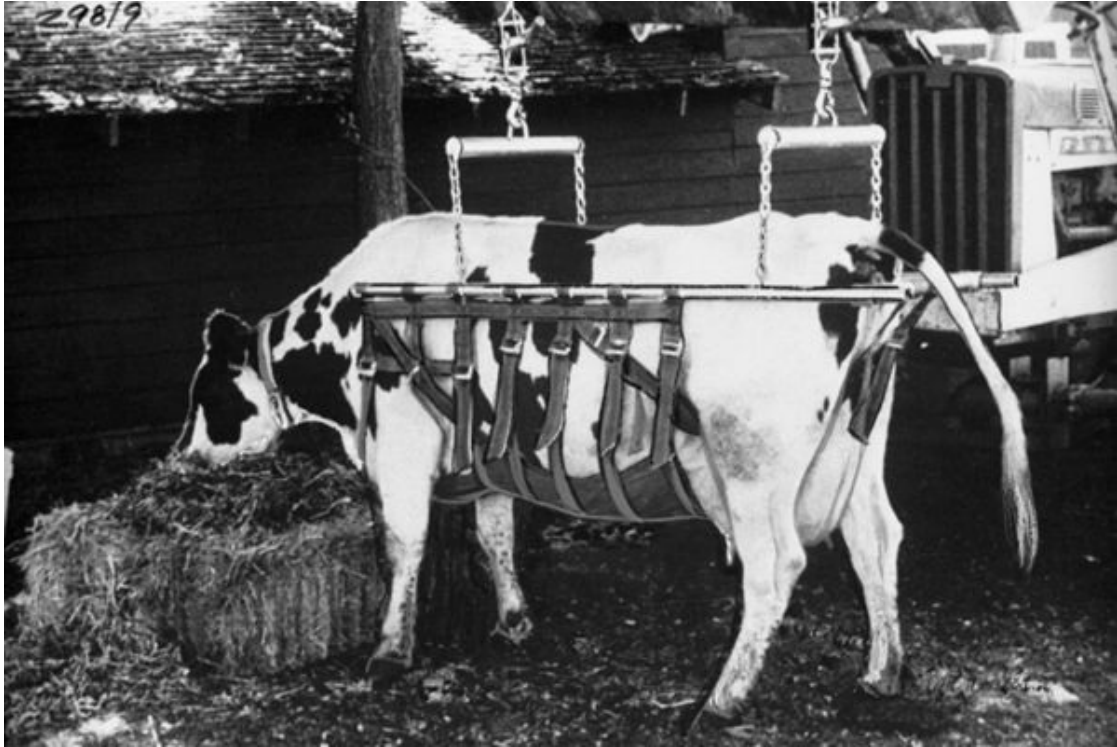


■ **Function**

To assist a cow to stand; most commonly used in postparturient paresis, milk fever, generalized weakness, obturator paralysis caused by fracture repairs, and when a cow is down on wet cement.

■ **Characteristics**

Padded rings are attached to a sturdy cross that can be lengthened by turning a crank. The bar is adjusted so that the rings fit tightly to the cow's hips. A cable is attached to the bar and passed over a beam; a winch or a come-a-long is used to hoist the cow up so that it is standing on its feet.



• Function

To get a cow back on its feet after surgery, injury, or illness.

■ Characteristics

A series of straps is positioned under the animal's chest, one in front of the front legs and the rest over the rib cage. The sling is brought up the animal's sides and attached to bars that can be attached to crossbeams in the ceiling or, for small animals, to carts. Models are available for sheep, horses, and dogs.

Bar



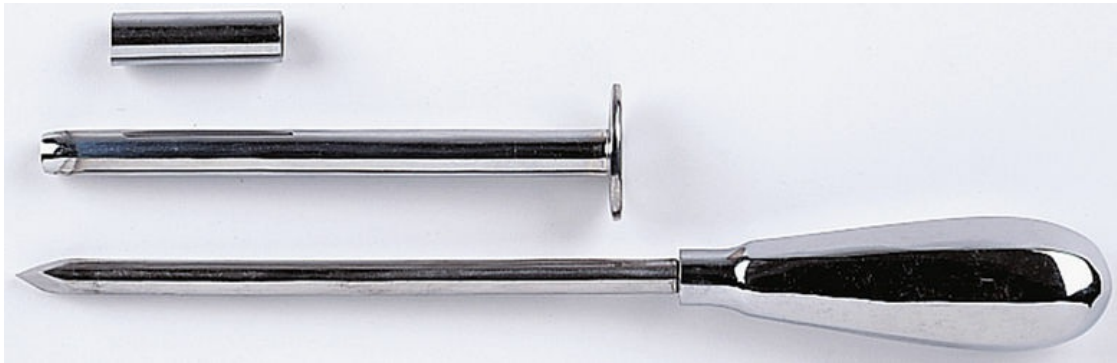
■ Function

To control kicking.

■ Characteristics

With push-button adjustments, one end is “hooked” under the flaccid-like ligament just above the udder and the other end is quickly “hooked” over the top of the spine. This enables optimal control.

INSTRUMENT Trocar and Cannula



• **Function**

To release from the rumen gases that cause bloating.

■ **Characteristics**

A sharp metal shaft is attached to a handle. The user plunges the trocar with the cannula over the trocar into the side of the animal. The cannula is a tube that is placed over the trocar and left in the hole created by the trocar. That allows gases to escape from the rumen. The cannula can be left in place until the reason for the bloating has passed, or in cases of chronic bloat it can be left in place indefinitely.



• Function

To collect and hold metal that has been ingested by a cow as it eats. The metal can cause “hardware disease” if allowed to pass through the rumen.

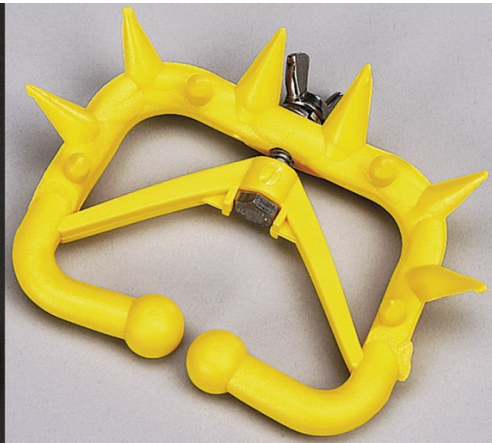
■ Characteristics

Three-inch magnets are passed into the rumen through the mouth. They remain in the rumen and collect bits of wire, nails, and other metal items that are inadvertently swallowed. Unfortunately, this is a cow’s only option because it cannot spit.

Weaners



Calf weaner



"Kant Suk weaner"

■ Function

To keep weaned calves and adults from nursing.

■ Characteristics

This device is attached to the nasal septum of an animal that insists on nursing long after it has been weaned. The device has prongs that prick the udder, making the cow kick the offender, or it has a flap that rests on the nose and prevents the animal from nursing. Both forms allow the animal to eat and drink normally.

CHAPTER 6

Instruments for Dehorning Animals



This chapter covers instruments used to remove horns from animals.

Gouge



■ Function

To remove horn buds or very small horns.

■ Characteristics

A metal tube ending with a very sharp edge is used to cut through tissue; the handle is usually rounded for easy gripping. The tube is pushed down around the horn until it hits the skull, then twisted around, first one way and then the other. The instrument is moved to a 45-degree angle to scoop the horn off the head. Another name for this instrument is the tube calf dehorner.

Dehorner



• Function

To remove small horns from calves, goats, and sheep.

■ Characteristics

Sharp, half-curved blades are affixed to handles that are 12 to 17½ inches long. The blades make a complete circle when the handles are brought together, and they close together when the handles are pulled apart. This allows the user to place the blades as close to the skull as possible so that the entire horn is removed.

INSTRUMENT Keystone Dehorner (Guillotine)



■ **Function**

To remove medium-sized to large horns.

■ **Characteristics**

This instrument has a blade that slices through the horn much as a guillotine would. When the handles are closed, the blade engages and cuts through the horn. This instrument is very heavy, so only a powerful person is capable of operating it.

► **Note**

Not shown are the long wooden handles that are placed in the receptacles.

INSTRUMENT

Dehorning Saw



• Function

To shorten long, large horns to the level of the head or to smooth a horn that has been broken.

■ Characteristics

A square saw blade is attached to a standard saw handle.

INSTRUMENT Wire Saw With Handles



■ **Function**

To remove large horns.

■ **Characteristics**

A rough-surfaced wire with handles is pulled back and forth across the surface of the horn, and it cuts through.

INSTRUMENT Electric **Dehorner**



• **Function**

To remove horn buds by killing the cells that produce horns or to cauterize blood vessels after the horn has been removed by other methods.

■ **Characteristics**

A metal head is heated by an electric or propane power source. The metal heads can be obtained in a multitude of shapes and sizes. They can be used to prevent horn growth in animals as old as 4 months and to prevent blood loss and the possibility of shock resulting from blood loss when large horns are removed.

CHAPTER 7

Catheters and Tubes



A variety of tubes and catheters are used in veterinary medicine to help patients recover from injuries, illnesses, and surgeries.

INSTRUMENT

Esophageal Stethoscope



■ Function

To allow the heartbeat to be heard; it is useful during procedures that require anesthesia.

■ Characteristics

This long flexible tube has a rounded end that is inserted into the esophagus until it rests beneath the heart. The other end is attached to a speaker device that makes the beating of the heart audible. This stethoscope can be used only in animals that have been anesthetized. It comes in a variety of sizes, which are measured by

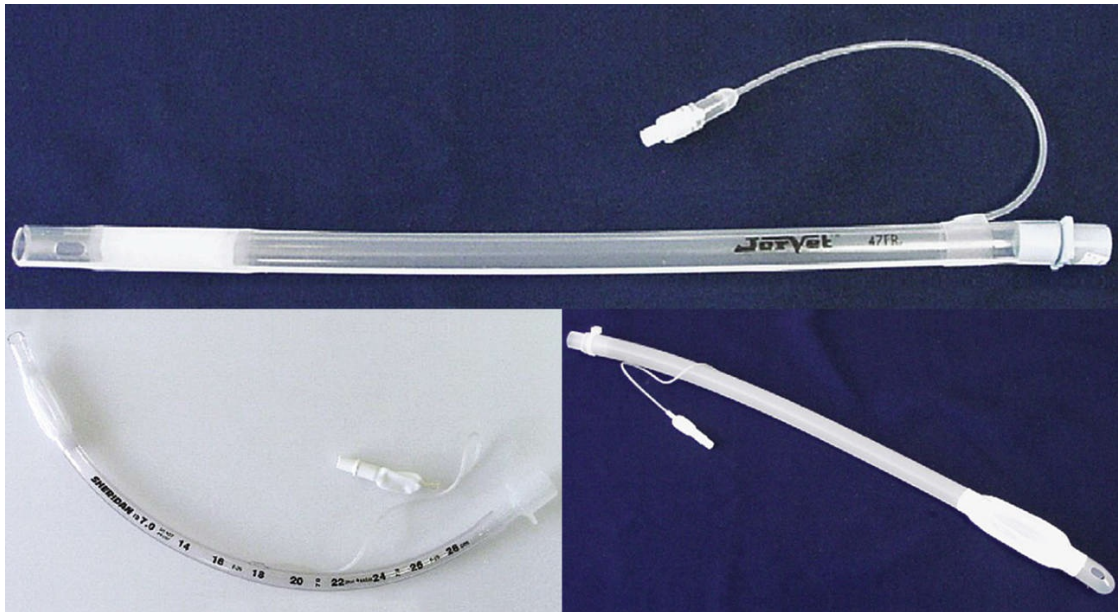
the French (Fr) scale; from smallest to largest, 12, 18, and 24 Fr are available.

► **NOTE**

It is important to measure against the outside of the animal to determine how far to insert the stethoscope.

INSTRUMENT

Endotracheal Tube



■ Function

To establish an open airway to deliver gas anesthesia or oxygen.

◆ Common Name

Trach Tube, ET Tube

■ Characteristics

A flexible tube available in a variety of sizes that range from 1 to 14 mm internal diameter. A cuff, which is on the end of most tubes, is used to seal the tracheal opening after insertion of the tube; this prevents the animal from breathing around the tube and prevents fluids from entering the lungs. The cuffs may allow use of a large or small volume of air, which is delivered via a one-way valve attached to the side of the tube. The tubes are made of silicone,

polypropylene, or red rubber.

INSTRUMENT V-Gel

Supraglottic Airway



■ Function

To establish an airway in cats.

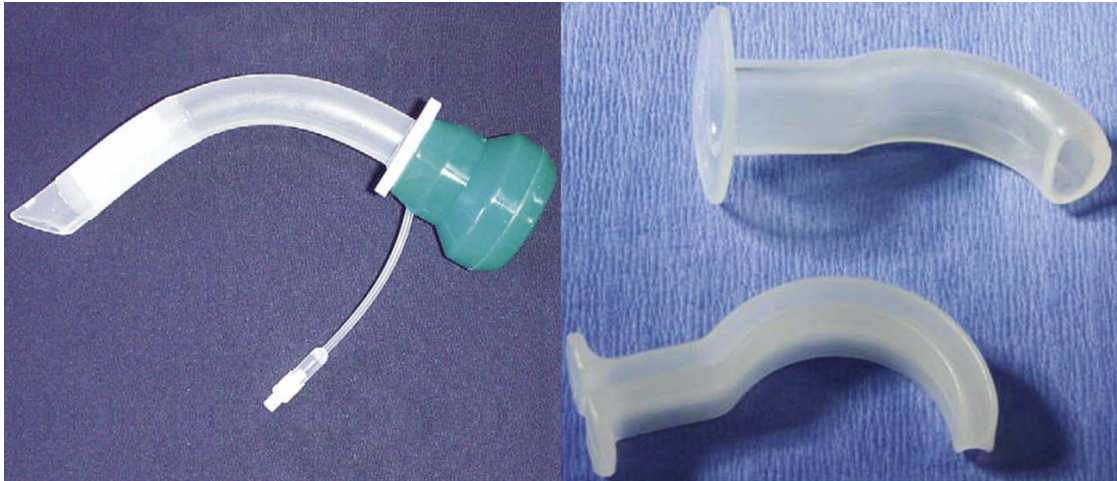
■ Characteristics

This species-specific airway is anatomically correct to fit securely over and surrounds the epiglottis in cats and rabbits. This is an alternative to intubating a cat with a standard endotracheal tube,

which can damage the trachea. There are six sizes for each species. It is reusable, as it can be autoclaved at low temperatures for up to 40 cycles.

INSTRUMENT

Tracheostomy Tube



Small animal tracheostomy tube

Equine tracheostomy tube

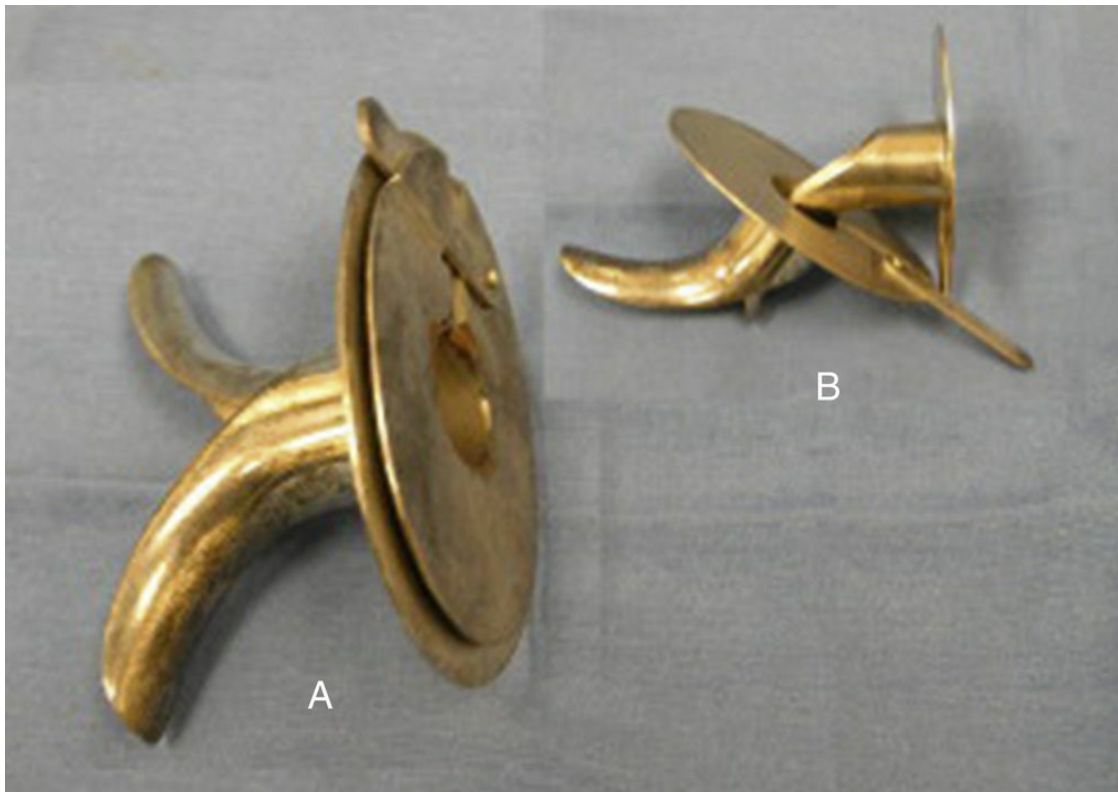
● Function

To establish an airway through the tracheal wall in a patient with an upper airway obstruction or critical illness.

■ Characteristics

A short tube that can be left in place on a short- or long-term basis. It may be cuffed or uncuffed and is made of silicone or silver-plated metal. Sizes range from 2.5 to 3 mm internal diameter for small animals.

INSTRUMENT Stainless Steel Self-Retaining Tracheotomy Tube



● **Function**

To establish an airway through the tracheal wall in a patient with an upper airway obstruction or critical illness.

■ **Characteristics**

This stainless-steel tracheotomy tube is utilized in large animals. It has an inside diameter of 22 mm and an outside diameter of 28 mm. It is a two-piece device, an introducer and a Y-shaped “tube” that spreads to hold the device in place.

INSTRUMENT Indwelling Intravenous Catheter



■ Function

To establish a port into a vein to deliver intravenous (IV) fluids to large and small animals.

◆ Common Name

IV catheter

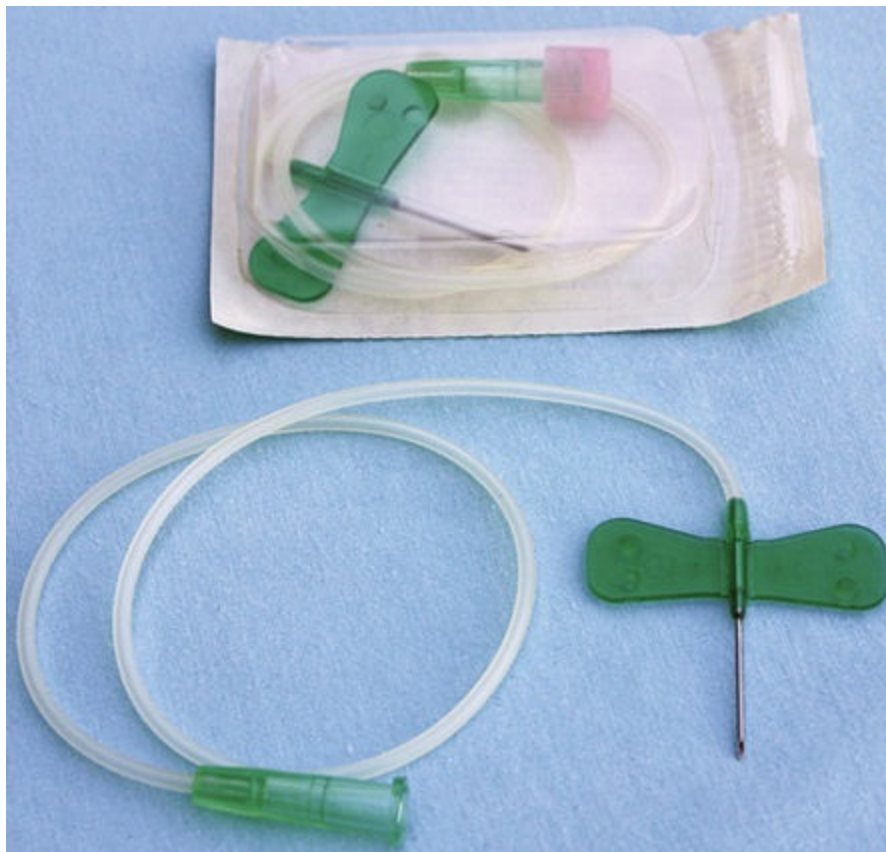
■ Characteristics

A flexible catheter is placed over a needle or through a needle. The

needle is used to puncture the skin and vessel; the catheter is then threaded into the vein. The needle is removed after the catheter has been placed. The catheter has a standard hub that receives the IV drip set or syringe tip. The hub is also used to secure the catheter to the animal's body. Sizes range from 24-gauge $\times \frac{3}{4}$ inch to 10-gauge $\times 5\frac{1}{4}$ inches. They can be made of polyurethane, Teflon, or Pebax or of nonreactive polyurethane for long-term use.

INSTRUMENT

Intravenous Butterfly or Winged Infusion Sets



• Function

To establish a port into a vein to deliver IV fluids or to draw blood samples from very small animals such as rabbits and kittens.

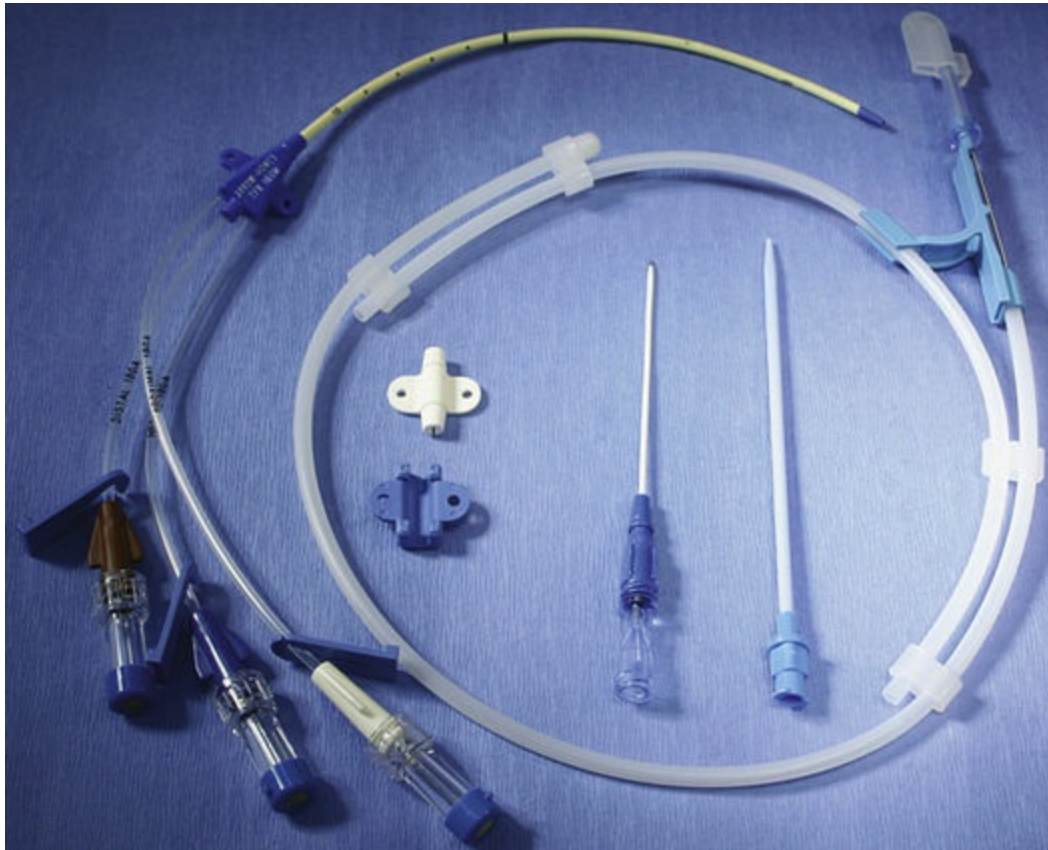
◆ Common Name

Butterfly catheter

■ Characteristics

This catheter has a standard 1-inch needle that is inserted into a vein. The wings are used to secure the catheter in place. The long tube on this catheter must be filled with fluid before insertion; otherwise, air will be introduced into the vein when the fluids are attached. This catheter is easy to place but difficult to keep in place because of the needle.

INSTRUMENT Central Venous Catheter



● **Function**

To establish a port into a vein or artery to deliver IV fluids over an extended period or to monitor central venous pressure or blood pressure by placement in an artery.

◆ **Common Name**

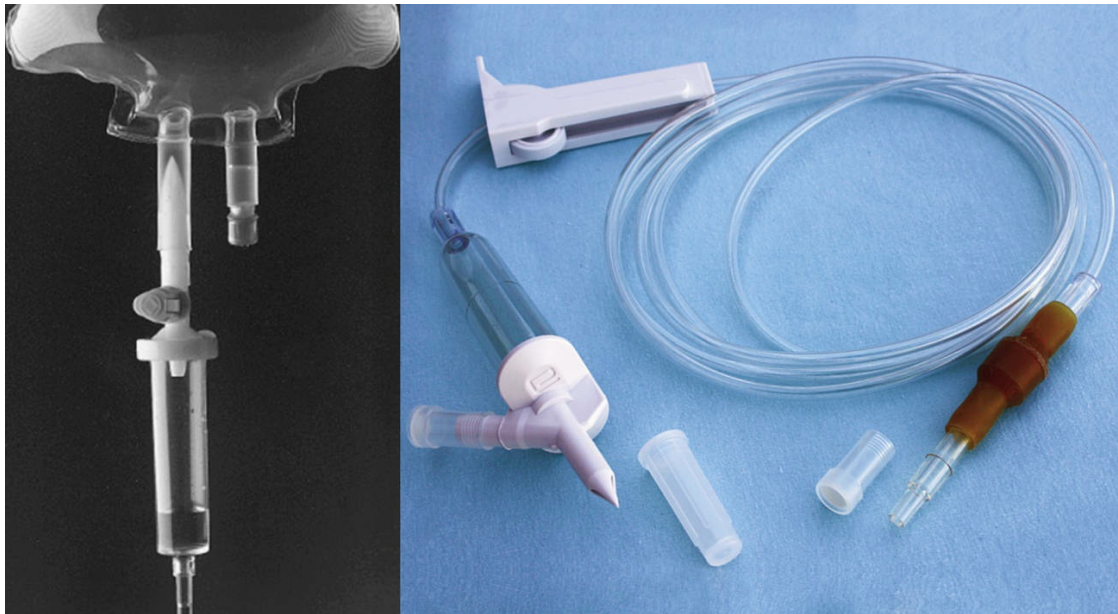
Central line

■ **Characteristics**

This catheter is usually quite long, and several steps are involved in its placement. The advantage of the catheter is that it can be left in place for more than 72 hours if strict attention is paid to sterile conditions during placement. This particular catheter comes with three ports that can accept different medications that may react with each other if given into the same port. This same type of catheter can be used for IV nutritional support; the nutritional type of catheter usually does not have more than one port.

INSTRUMENT

Intravenous Drip Sets



■ Function

To provide a connection between the IV catheter and the IV fluids and to regulate the flow of the fluids.

◆ Common Name

IV drip set, IV line, venous sets

■ Characteristics

A long flexible tube with various ports and shut-off valves is attached to the reservoir of the IV fluids and then attached to the IV catheter. Drip sets come in a variety of sizes that deliver 10, 15, 20, or 60 drops per minute. It is important to note the size of the set in use so the correct amount of fluid can be delivered in the prescribed time.

INSTRUMENT T-Port or Extension Port



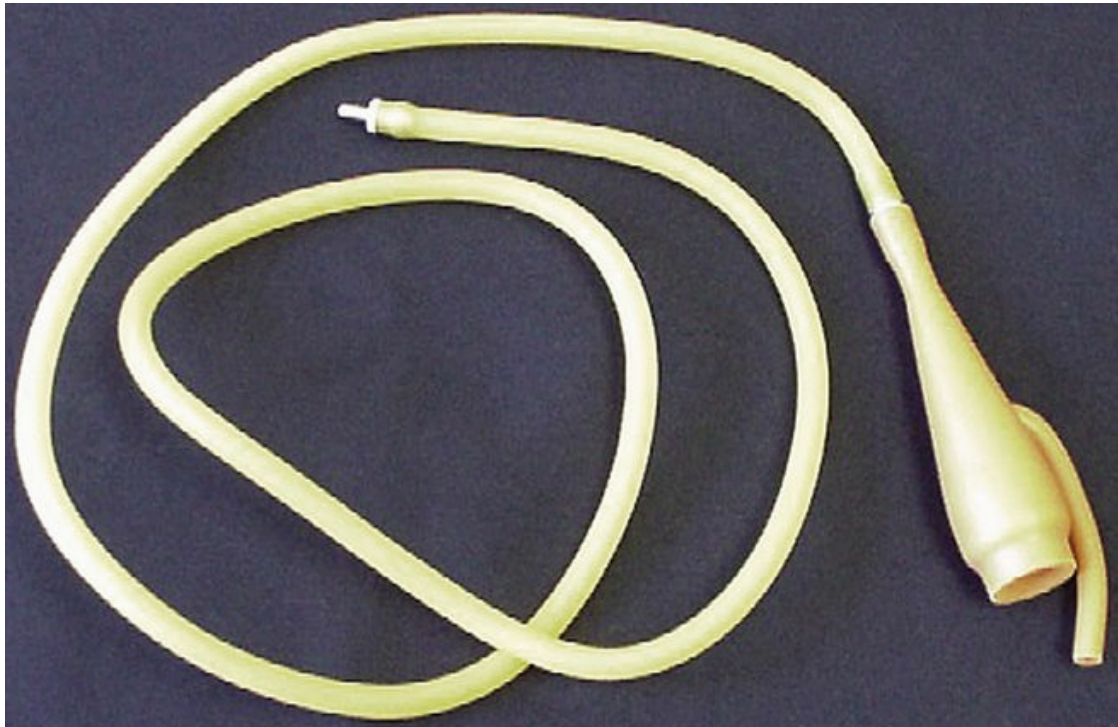
■ Function

Establishes two injection ports into one catheter.

■ Characteristics

This extension tube is attached between the IV catheter and IV tube. The side port allows for quick, easy access without fear of dislodging the catheter.

INSTRUMENT Simplex Intravenous Bell Sets



● **Function**

To provide a connection between the IV catheter and the IV fluids and to regulate the flow of those fluids.

◆ **Common Name**

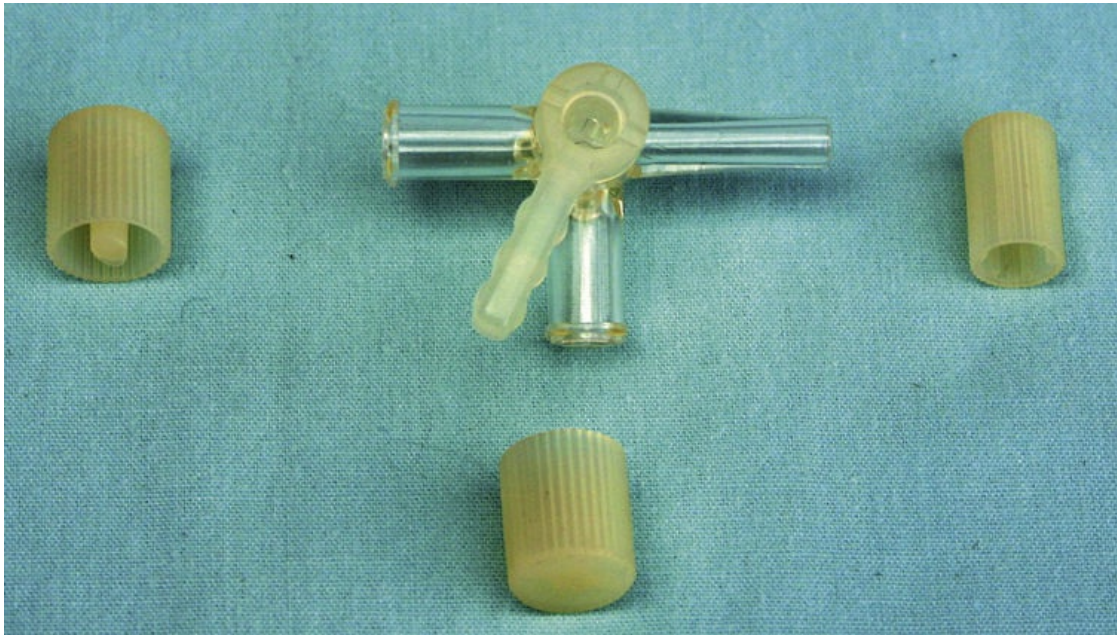
Gravity IV set

■ **Characteristics**

This set uses gravity to enable the flow of the fluids. Latex tubing has a flexible funnel at one end that fits over the top of a bottle; the other end of the tubing has a tip that fits into a standard catheter

hub. Some models have an air hose that can be clamped to prevent the fluids from flowing. The bottle is raised or lowered to speed up or slow down the rate at which the fluids are introduced into the animal. This set is used in large animals.

INSTRUMENT Three-Way Stopcock



• **Function**

To give the user more than one port through which to administer solutions via syringes or other IV lines.

◆ **Common Name**

Stopcock

■ **Characteristics**

This plastic instrument has a tip that fits into the end of a catheter; the other two ends have standard hubs that accept syringes or IV lines. The dial on the top directs the flow into the catheter from one hub or the other.

Cap



■ Function

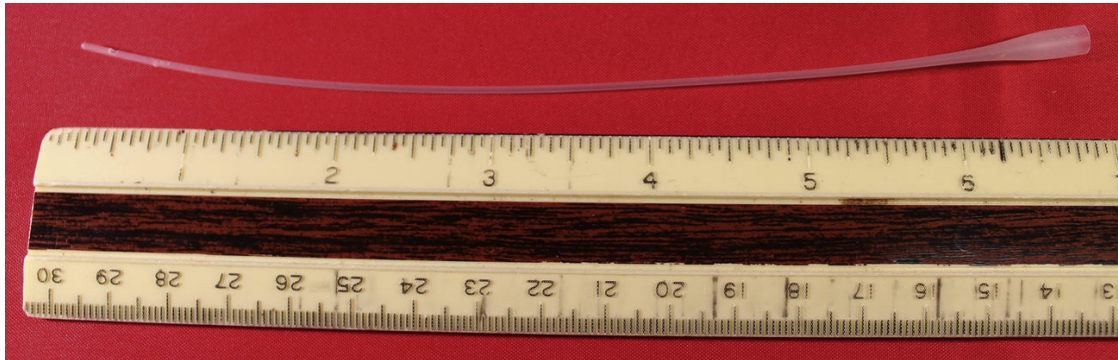
To close off the end of a catheter.

■ Characteristics

A small plastic cap is designed to be inserted into the hub of a catheter. It has a rubber stopper on the other end that can be punctured by a standard hypodermic needle. This allows the IV drip set to be inserted and removed without fear of dislodging the catheter or of introducing bacteria when removing the tubing. It is also used to maintain a catheter's placement.

INSTRUMENT **Tom Cat**

Catheter



• **Function**

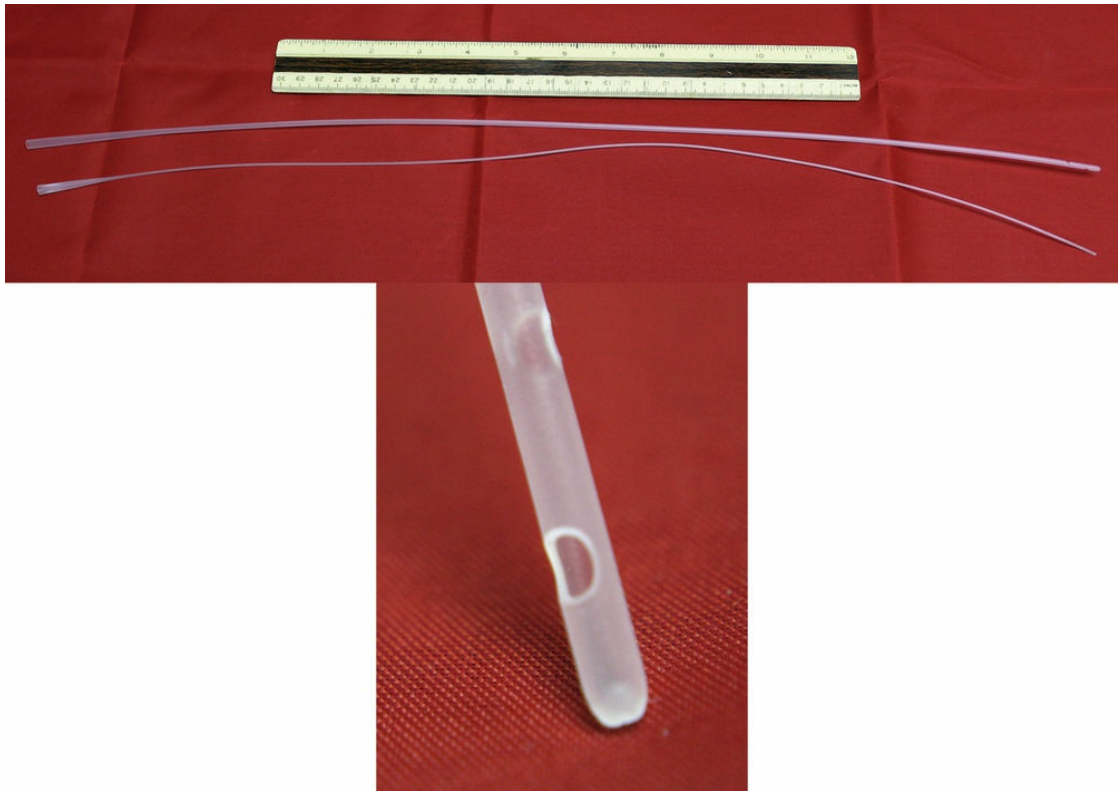
To catheterize a male cat, in most cases because of urethral blockage but also to secure a urine sample.

■ **Characteristics**

A polypropylene catheter approximately 6 inches long tapers to a rounded point.

INSTRUMENT

Polypropylene Urethral Catheter



■ Function

To catheterize a male dog, in most cases because of urethral blockage but also to secure a urine sample.

◆ Common Name

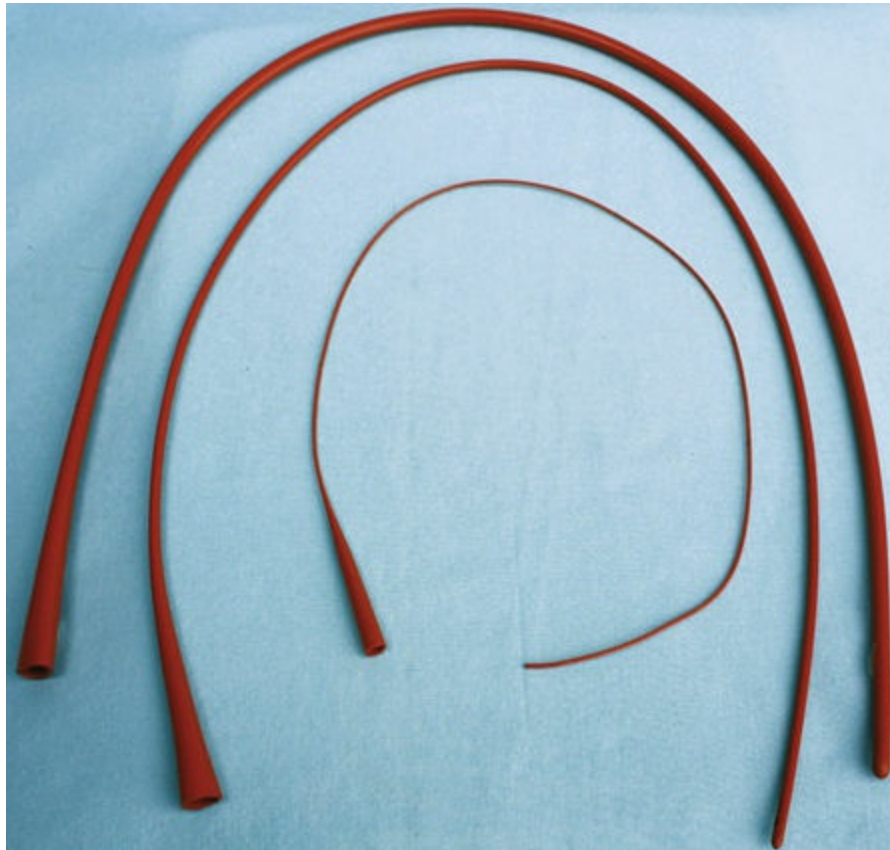
Dog catheter

■ Characteristics

A polypropylene catheter approximately 18 inches long tapers to a rounded point. It is available in a range of sizes: 3½, 5, 8, 10, and 14

Fr.

INSTRUMENT Feeding Tube and Urethral Catheter



● **Function**

To be used as a nasogastric or esophageal feeding tube or a urinary catheter.

■ **Characteristics**

This flexible red rubber catheter is approximately 12 to 18 inches long and is available in 8 to 20 Fr, in increments of 2, as well as in 24 and 28 Fr. Most have lateral “eyes,” or openings, close to the tapering tip.

Catheter



• Function

To catheterize an animal when the catheter must be retained. The catheter can be placed in the urethra, rectum, or uterus.

• Common Name

Foley

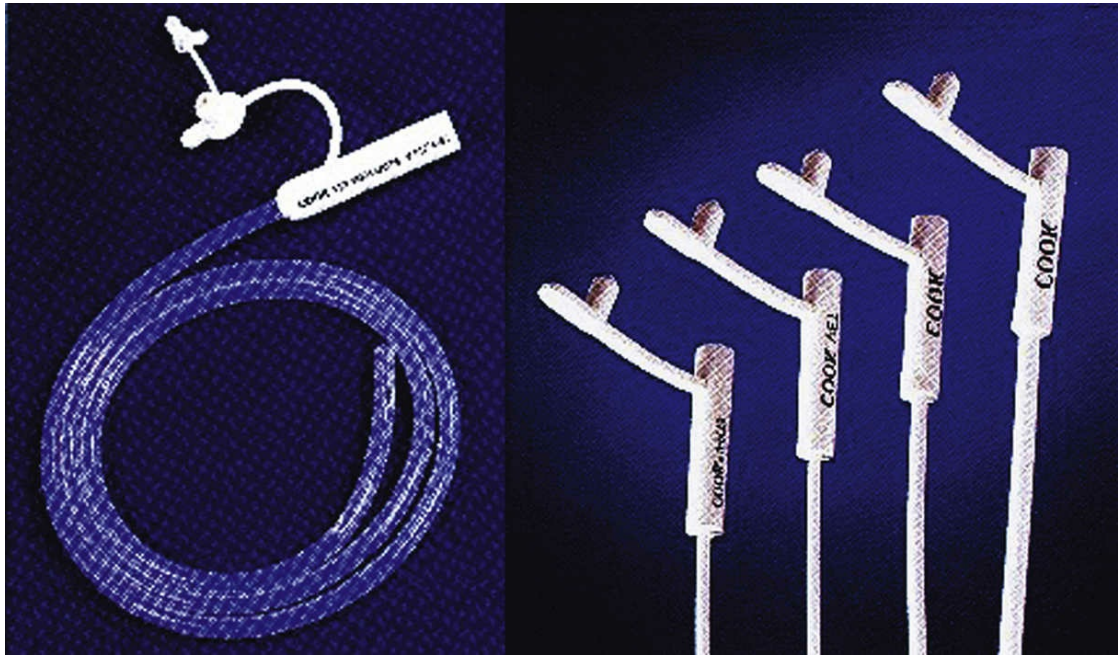
■ Characteristics

This soft, silicone-coated, amber latex catheter has a balloon of 3, 5,

or 30 mL near the end close to the tapered tip. The balloon is inflated with water or air, and that is used to keep the catheter in place.

INSTRUMENT

Enteral Feeding Tubes



• Function

A means of providing nutrients over long periods.

■ Characteristics

Tube A is placed directly into the stomach through the abdominal wall. The tube has a mushroom tip that expands to fill the resulting hole and secure the tube in place. This tube remains in place until the animal no longer requires it. Tube B is directed through the nasal passages and into the stomach. It is removed after the nutrition is delivered. There are many types of enteral feeding tubes for all species of animals.

INSTRUMENT Female Canine Catheter



• **Function**

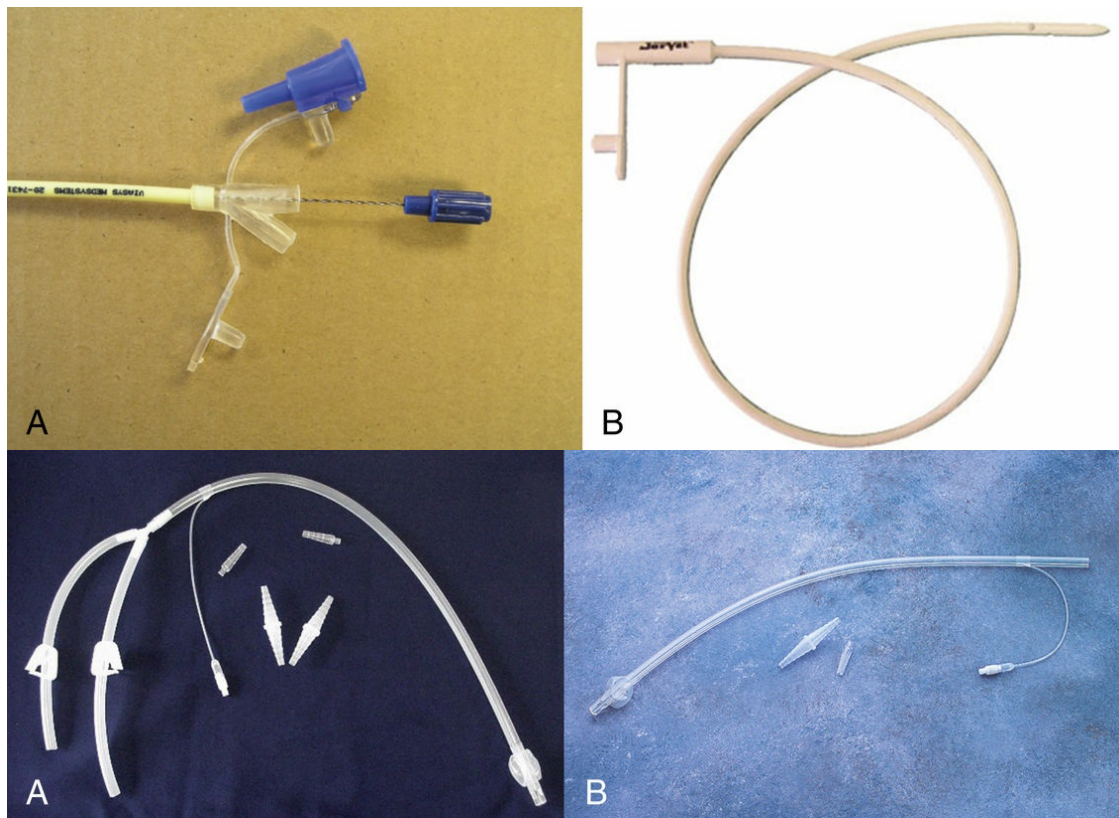
To catheterize the bladder or uterus of a female dog.

■ **Characteristics**

This stainless-steel catheter is approximately 10 inches long and tapers to a rounded tip. The opposing end has a heart-shaped handle.

INSTRUMENT Mare

Uterine-Flushing Catheter



■ Function

To collect or transfer an embryo or to medicate the uterus.

■ Characteristics

This flexible catheter comes in 33 Fr and is 65 or 135 cm in length. It has an inflatable cuff and two different adapters for attaching tubing or a standard Luer fitting.

INSTRUMENT

Mare

Urinary Catheter



• Function

To catheterize the bladder.

■ Characteristics

A slightly angled, stainless-steel tube; it has opposite-facing eyes on the end.

Speculum



• Function

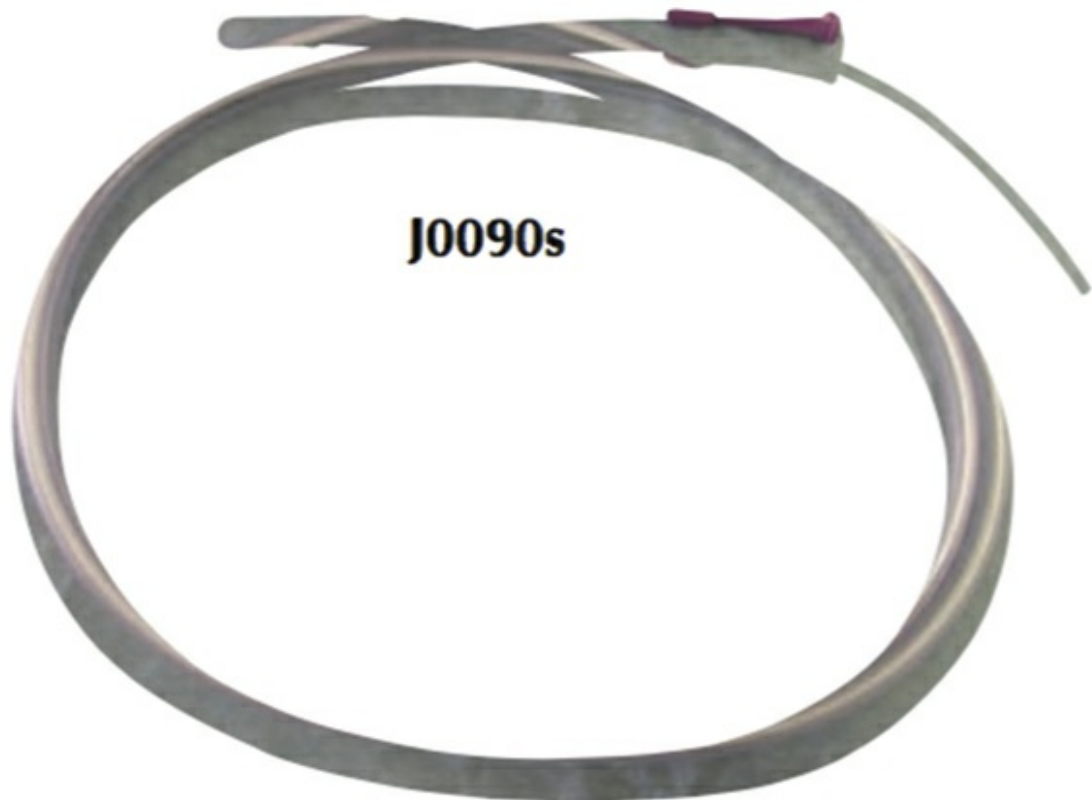
To open the vaginal vault so as to pass swabs or tubes into the uterus or bladder.

■ Characteristics

A solid plastic tube; it can be sterilized.

INSTRUMENT Stallion

Urinary Catheter



■ **function**

To catheterize a male horse

■ **Characteristics**

This flexible catheter is 6.6 mm × 137 cm long.

Catheter



• Function

To catheterize the bladder.

■ Characteristics

This stainless-steel catheter has a scooped-out area just before the tip.

INSTRUMENT

Penrose Drain



■ Function

Provides body fluids a path to exit the body.

■ Characteristics

A flexible rubber tube is placed under the skin of large wounds to allow fluids to evacuate while the wound heals. It requires daily care to keep the wound draining while the wound heals.

CHAPTER 8

Instruments for Castration of Large Animals



This chapter covers instruments that are used to castrate, tail-dock, and ear-notch large animals.

INSTRUMENT **Burdizzo**

Emasculatome



■ **Function**

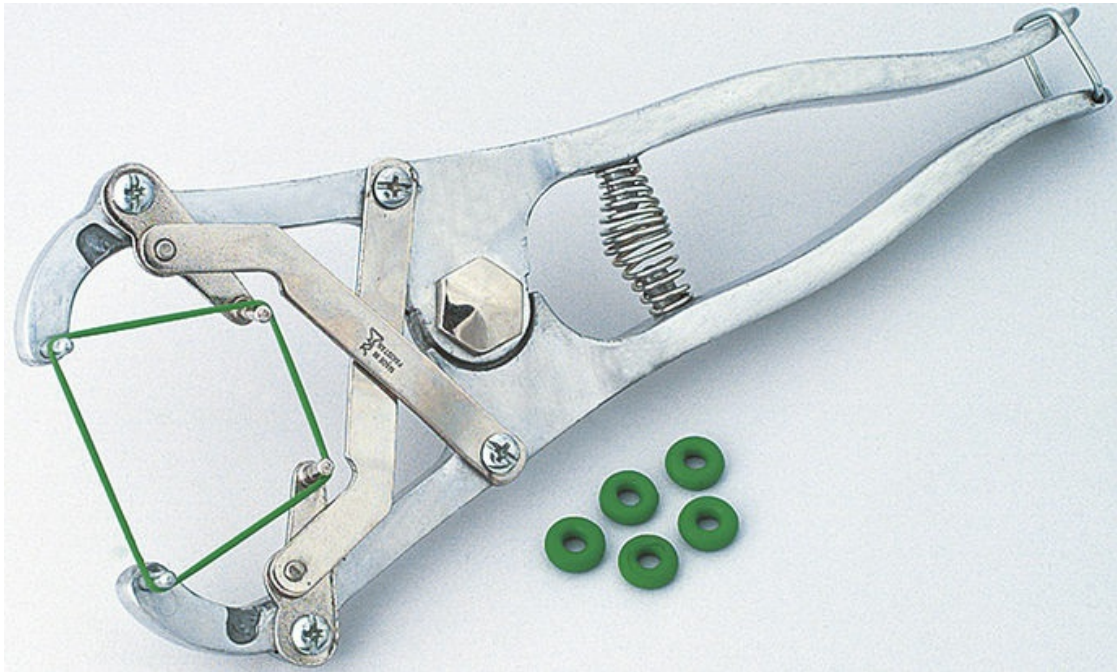
To perform a bloodless castration in a large animal.

◆ **Common Name**

Burdizzo

■ **Characteristics**

Blunt jaws have a double-action wrenching device which crushes the blood vessel and spermatic cord inside the skin of the testicle, making it a bloodless castration. This is not recommended on very large testicles because it is difficult to apply enough pressure. This instrument is available in 9-, 12-, 14-, 16-, and 19-inch lengths. A knee brace is available for the larger models.



■ Function

To perform a bloodless castration or tail dock on a large animal.

■ Characteristics

This instrument has pegs; a thick rubber band can be placed around them. The handles are squeezed to stretch the rubber band so that it goes around the testicle or tail. The rubber band restricts blood flow to the testicle or tail, and is left in place until the testicle or tail falls off. This too is considered a bloodless technique.

Emasculator



■ Function

To perform castration on a large animal.

■ Characteristics

This instrument has a crushing platform (A) as well as a cutting blade (B) incorporated into the jaws. The scrotal sack is incised with a scalpel blade; the testicle is pulled out of the scrotum and the emasculator is applied so that the cutting edge is next to the testicle and the crushing platform (A) is toward the body. When the handles are squeezed, the testicle is severed from the body and the blood vessel and spermatic cord are crushed. This prevents heavy bleeding. If applied incorrectly, the blood vessel is not crushed, which can cause severe hemorrhaging.

INSTRUMENT Reimer

Emasculator



■ Function

To perform a castration on a large animal.

■ Characteristics

This instrument has a crushing action that is separate from the cutting lever (*arrow*). The testicle is surrounded by the jaws. The crushing is done by applying pressure and locking the jaws. The cutting lever is then squeezed to remove the testicle. It is important to be sure that the instrument is positioned so that the crushed tissue is close to the body in order to prevent hemorrhaging.

INSTRUMENT **Serra**

Emasculator



■ **Function**

To perform castration in a large animal.

■ **Characteristics**

This instrument is designed to draw the spermatic cord and blood vessel concentrically into the jaws, which prevents the cords from slipping. In addition, they are pressed together and crushed as they are cut, which prevents postoperative hemorrhaging.

INSTRUMENT Newberry **Castrating Knife**



• **Function**

To cut the scrotal sac for testicle exposure.

■ **Characteristics**

A sharp blade is attached to handles; this allows the handler to split the scrotal sac in a controlled manner.

INSTRUMENT All-in-One Lamb Castrator, Docker, and Ear Marker



● **Function**

To castrate, dock the tails, and notch the ears of lambs, kids, and piglets.

■ **Characteristics**

Sharp blades on the side of the instrument are used to dock the tail and nip off the end of the scrotal sac. The jaws are used to stretch-pull the testicles out of the body. The ear notcher is located at the base of the knife section.

CHAPTER 9

Obstetrical Instruments



This section covers instruments that are used to assist with obstetrical (OB) examinations, dystocia and breeding, or infertility issues.

INSTRUMENT

Obstetrical Chains and Handles



Chains

Handles

■ Function

To assist with the delivery of a calf.

◆ Common Name

Obstetrical (OB) Chains and OB Handles

■ Characteristics

The chains are flat links that prevent trauma to the calf's legs. The handles have a hook that fits onto the chains at any link for optimal directional and pulling power.

INSTRUMENT **Fetal**

Extractor



● **Function**

To assist with the delivery of a calf.

■ **Common Name**

Calf Puller, Calf Jack

▶ **Characteristics**

The strap on the brace piece is placed over the hips of the cow. OB chains or straps are attached to the legs of the calf. Along the shaft of the calf puller is a come-along, which is a cable attached to a ratchet that reels the cable into a spool. The cable is attached to the OB chains, and the user gently inches the calf out of the cow, while working with the cow's contractions and at the correct angles.



• **Function**

To assist with the delivery of a calf.

■ **Characteristics**

This nylon-coated cable is equipped with a locking device that will not tighten down on the body part to which it is attached. This is very useful in pulling a head into proper alignment and keeping it in place until the calf is delivered.

INSTRUMENT

Obstetrical Wire



■ Function

To disarticulate a dead fetus so as to aid in its removal.

◆ Common Name

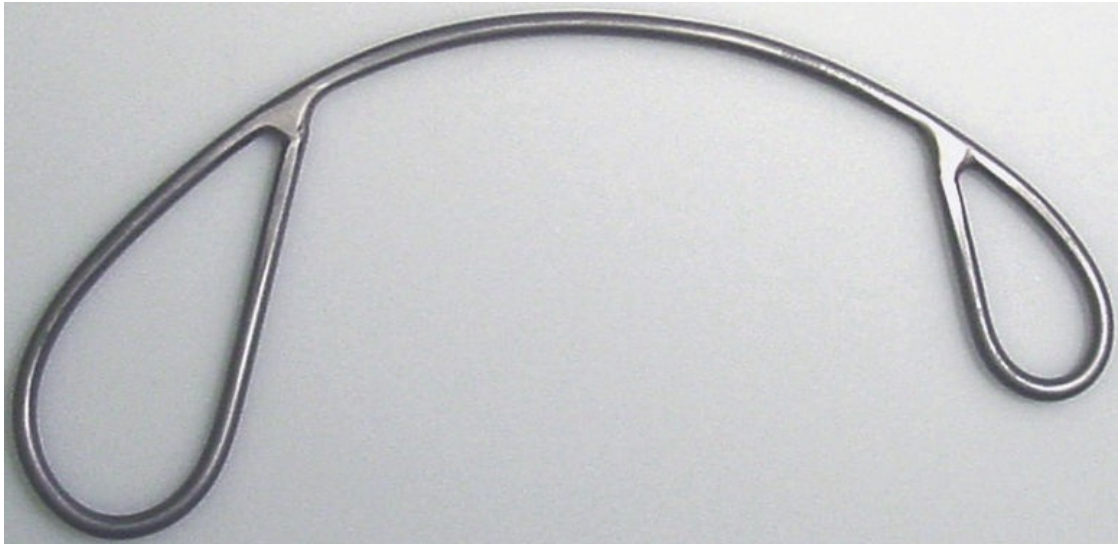
OB Wire

■ Characteristics

This is a rough cablelike material that cuts through bone and sinew when it is rubbed back and forth. As parts are removed, the calf can be pulled from the cow.

INSTRUMENT

Obstetrical Wire Guide



■ **Function**

To help guide the OB wire to the appropriate area for cutting.

■ **Characteristics**

A curved handle ends in a weighted bulb in which the wire is threaded.

Knife



• Function

To disarticulate a dead fetus so as to aid in its removal.

■ Characteristics

This instrument is designed to fit into the palm of the hand. The index finger is slipped into the ring and curled over the top of the blade. This allows the knife to be directed to the appropriate area for cutting.



■ **Function**

To disarticulate a dead fetus so as to aid in its removal.

■ **Characteristics**

An OB wire is passed inside the fetatome; it protects the mother's delicate tissues as the saw is worked back and forth.

Obstetrical Hook



Krey OB hook



Ostertag's blunt eye hook

• Function

To hold onto the fetus while performing an embryotomy.

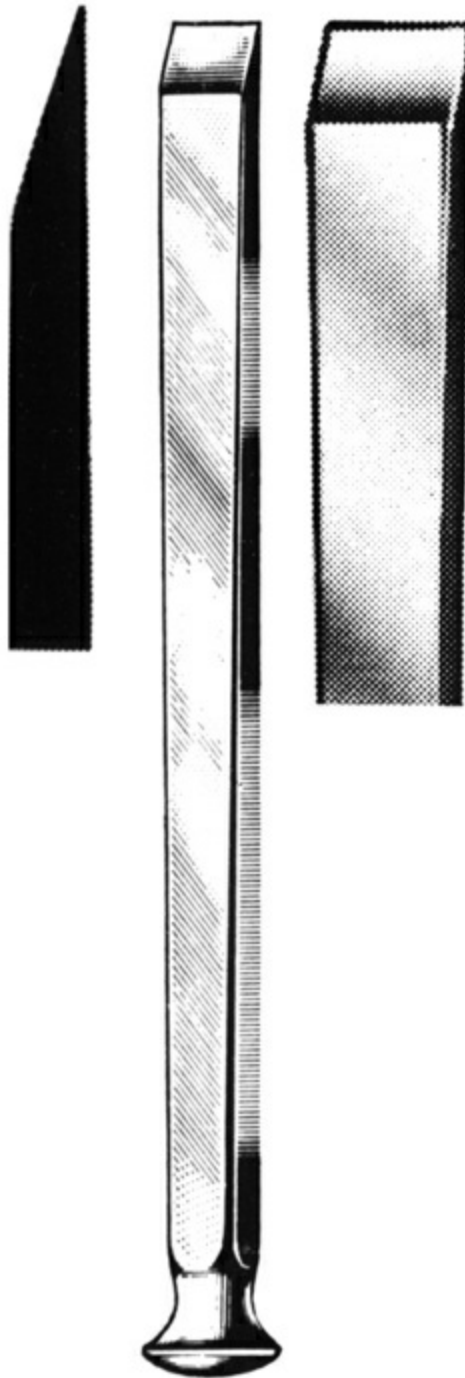
• Common Name

OB Hook

■ Characteristics

The hooks bite into the fetus to hold it steady.

Chisel



■ **Function**

To split the uncalcified pubic symphysis so as to widen the pelvic canal, which allows the fetus to be delivered.

■ **Characteristics**

This is a larger version of the orthopedic osteotome. A small incision is made below the ventral commissure of the vulva in the floor of the pelvis. The chisel is placed at the pubic symphysis and struck with a mallet; this widens the birth canal.

INSTRUMENT Vaginal Speculum—Killian



■ **Function**

To hold open the labia so the vaginal vault can be viewed, swabs taken, and medication delivered to the uterus. It can also be used during the urinary catheterization of a female.

■ **Characteristics**

Tapering jaws can be opened by squeezing the handles. A screw set at the top of the handles is turned to keep the jaws open.

INSTRUMENT Vaginal Speculum Polansky Canine



■ **Function**

To hold open the labia so the vaginal vault can be viewed, swabs taken, and medication delivered to the uterus. It can also be used during the urinary catheterization of a female.

■ **Characteristics**

Larger than the Killian speculum, the Polansky speculum is opened by squeezing the handles and can be locked into place by turning the knob. This instrument is too big for most small animals; it is used in large animals.

INSTRUMENT Umbilical Tape with Buhner Needle



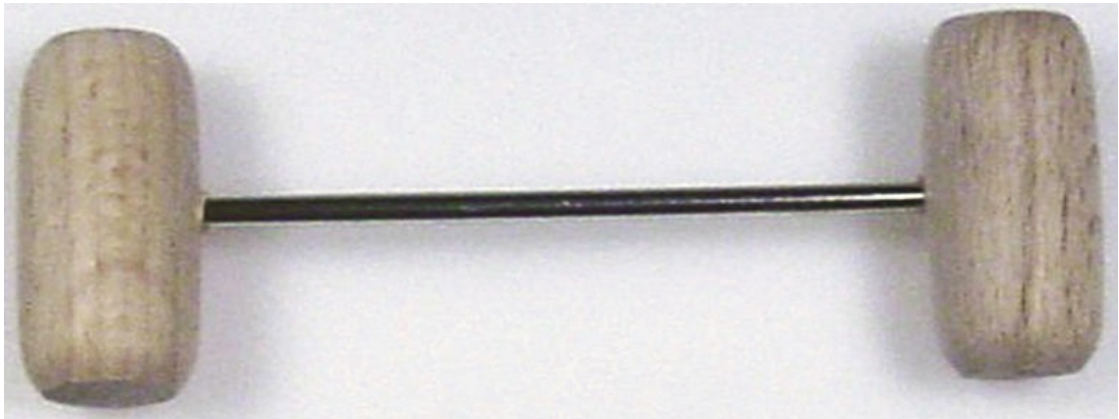
• **Function**

To suture a large animal after abdominal surgery or to suture the vagina closed after a prolapse.

■ **Characteristics**

Polyester braided “tape” comes in $\frac{1}{8}$ -, $\frac{3}{8}$ -, and $\frac{1}{4}$ -inch widths. It is usually packaged in a canister that allows the user to withdraw as much as needed without contaminating the remainder.

Suture Pins



• Function

To retain a uterine or vaginal prolapse.

■ Characteristics

Metal pins are placed across the vulva and stoppered with hard rubber ends that keep the pins in place.

Detorsion Rod



• Function

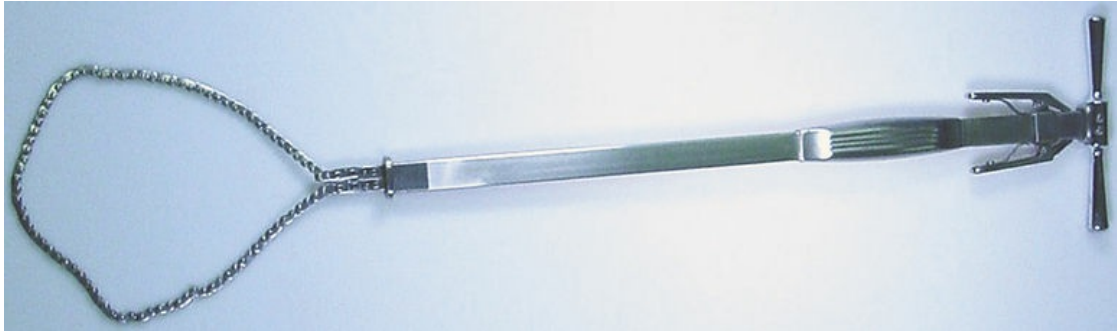
To correct a uterine torsion.

■ Characteristics

This instrument has a loop at one end through which a soft rope can be threaded. The resulting loop is attached to the fetus. The other end requires a wooden dowel inserted into the loop to become a handle. This is turned to undo the uterine torsion.

INSTRUMENT

Ecraseur



• Function

To spay a heifer.

■ Characteristics

A small incision is made in the side of the animal. The loop is placed around the ovary and facilitates its removal.

INSTRUMENT

Freemartin Probe



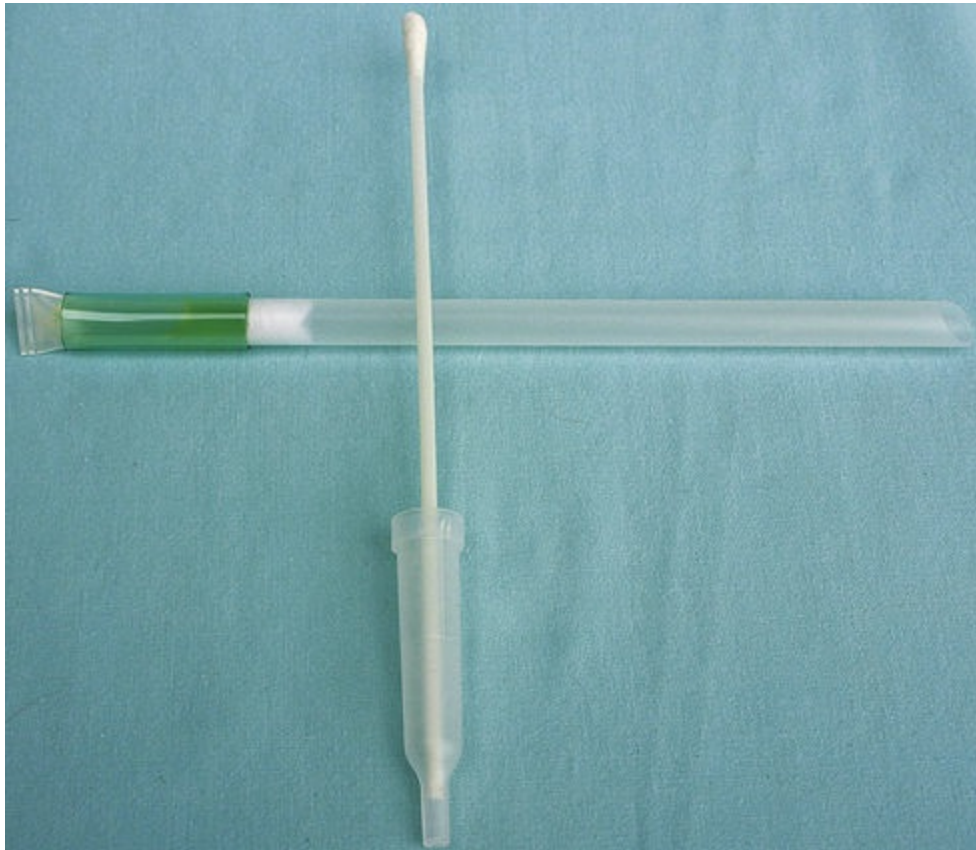
• Function

To check for freemartin heifers and to determine whether a heifer that is a twin to a bull calf has a normal reproductive tract.

■ Characteristics

The probe end of this instrument is placed inside the vagina. If it measures 7 cm or less, the heifer is a freemartin. If the heifer is born with a bull twin, the tract may be as large as 14 cm.

Swab



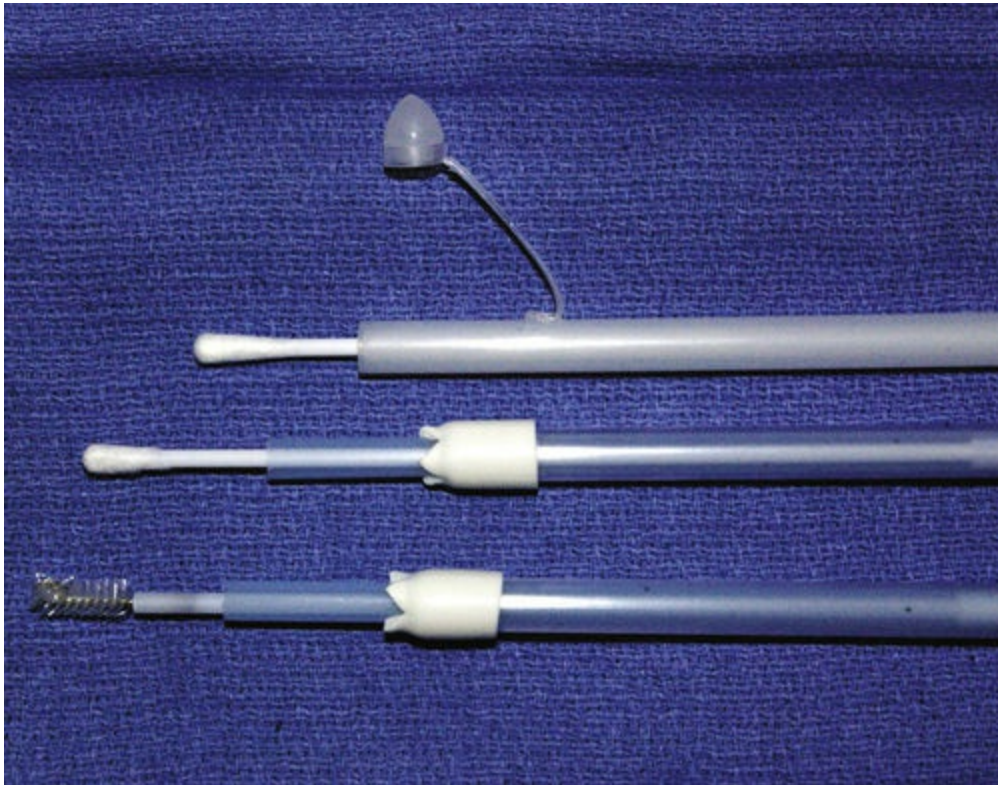
■ Function

To culture the uterus for a variety of screening tests.

■ Characteristics

A long plastic tube contains a sterile swab. The tube is inserted into the vagina up to the cervix or even into the uterus. The swab is pushed past a cap or rubber tip that protects it from contamination as it is being inserted. The swab is taken, then pulled back into the protective plastic before being withdrawn.

INSTRUMENT Uterine Cytology Brush



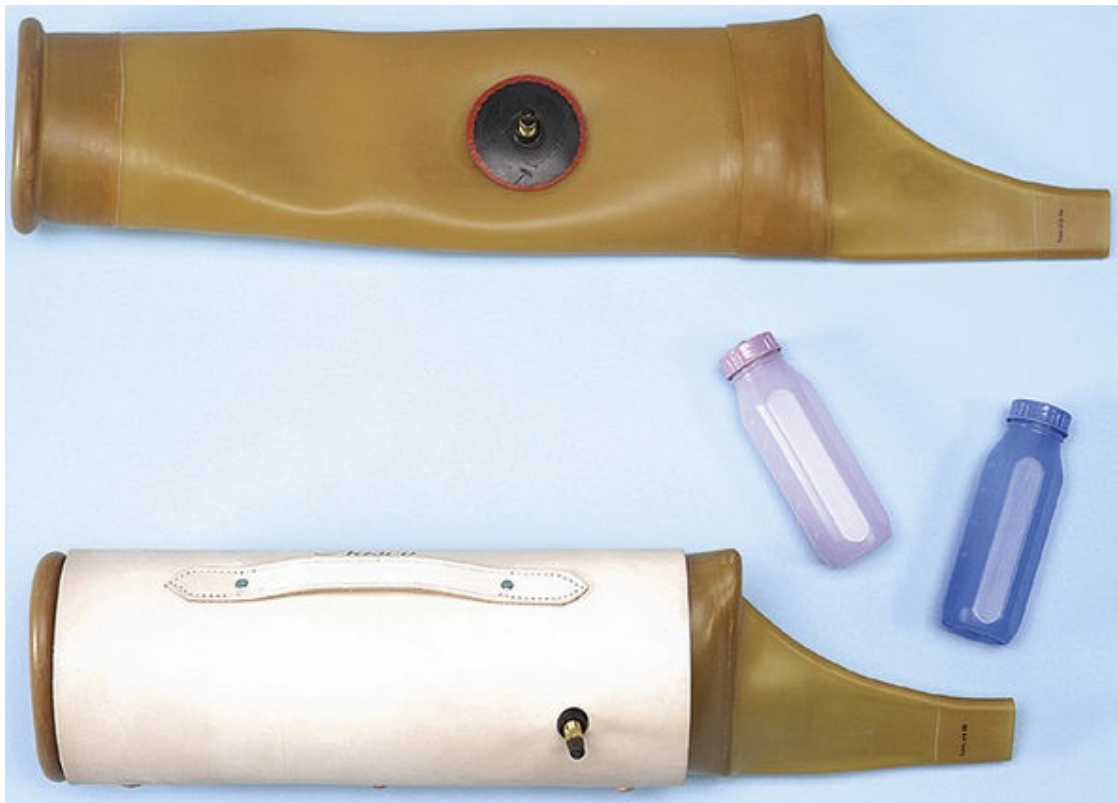
■ **Function**

To gather cells from the cervix.

■ **Characteristics**

Built much like the culture swab, this device has a cytology brush that, when brushed against tissues, collects cells for analysis.

INSTRUMENT Artificial Vagina



■ Function

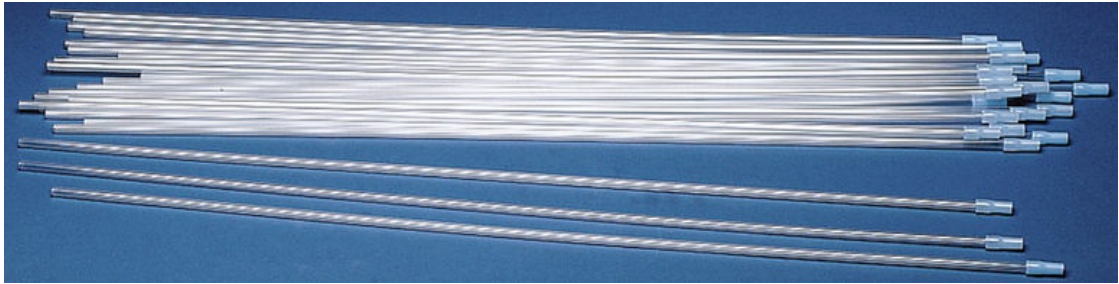
To allow the collection of semen from a stimulated male.

■ Characteristics

A hollow tube is fitted with a latex collection liner and is readied for insertion into the penis. Models for cattle, horses, pigs, and sheep are available.

INSTRUMENT

Insemination Pipettes



• Function

To deliver semen directly into the uterus.

■ Characteristics

These long PVC pipettes allow deep insertion so the sperm can be delivered into the uterus.

INSTRUMENT

Obstetrical Gloves



■ Function

To protect personnel from zoonotic diseases and keep clothing clean.

■ Characteristics

These gloves have extra-long sleeves that reach to the shoulder. They are made of plastic or latex and are disposable.

INSTRUMENT

Heat Mount Detector



• Function

To mark a cow that is in standing heat.

■ Characteristics

A metal reservoir filled with marking paint is attached to a headstall. The headstall is strapped onto a gomer bull so that the reservoir rests under his chin. The reservoir works like an ink pen, marking the cow as the gomer bull slides off her.

INSTRUMENT Umbilical Clamp



■ **Function**

To clamp the umbilical cord before it is cut.

■ **Characteristics**

The clamp is made of plastic and has a locking mechanism to keep it in place.

INSTRUMENT Calf, Foal, Piglet, and Lamb Resuscitators



Calf and piglet resuscitator

Lamb resuscitator

■ **Function**

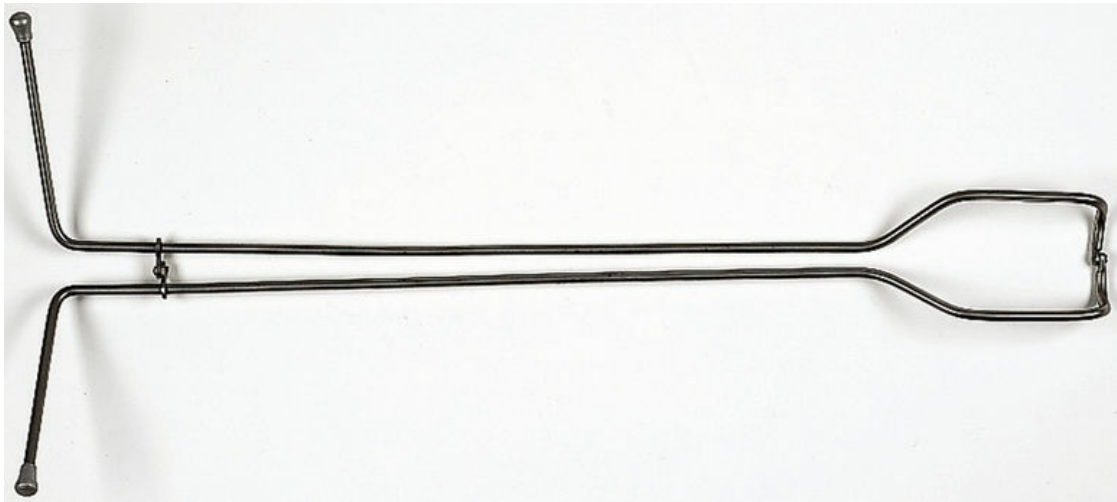
To provide room air to a large-animal newborn that is having difficulty breathing.

■ **Characteristics**

A face mask is designed to fit over the muzzle of the animal; room air is forced into the lungs by a bellows or pump or by breathing into the mouthpiece.

INSTRUMENT Pig

Obstetrical Forceps



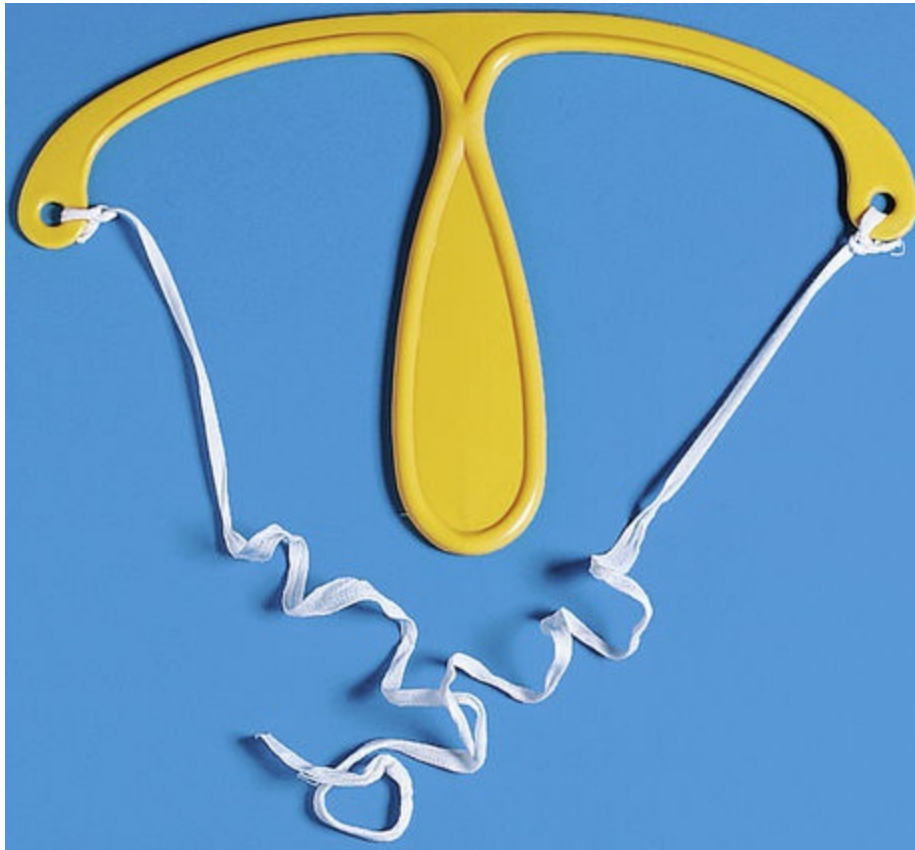
■ **Function**

To assist in delivering a piglet.

■ **Characteristics**

The hinged, bowed area is designed to open so that it can grasp a head or hips, not the uterine lining.

Prolapse Retainer



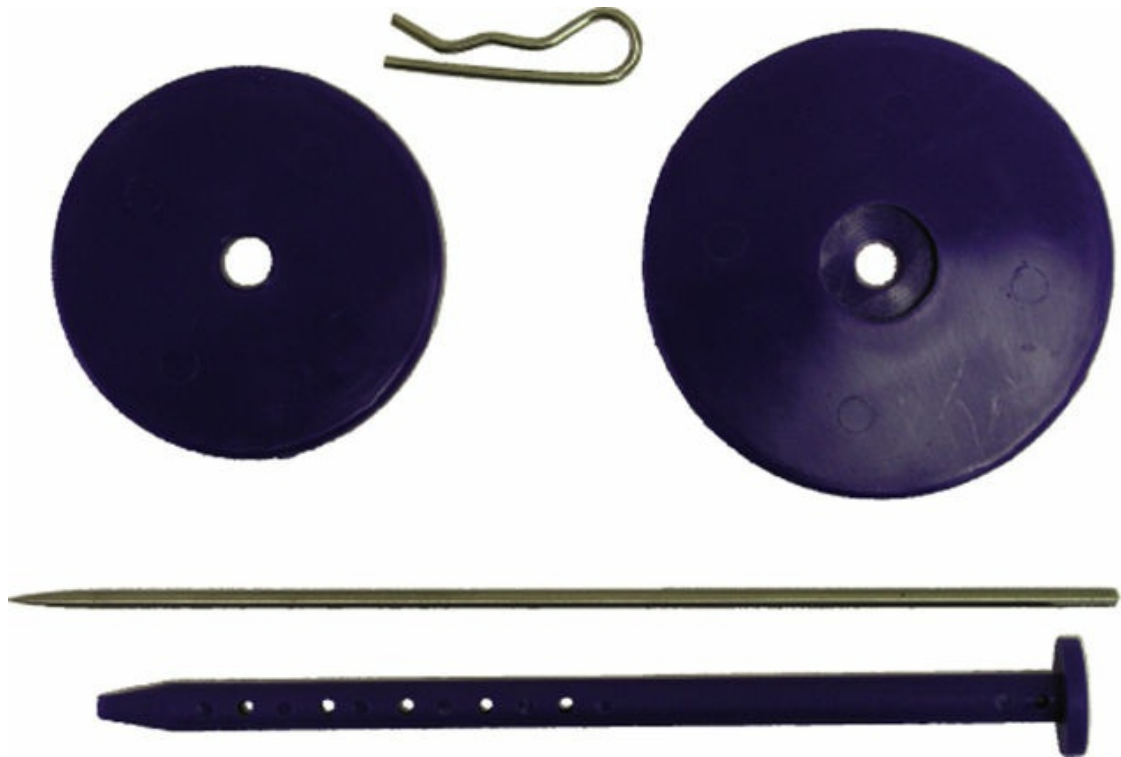
■ **Function**

To retain a vaginal prolapse.

■ **Characteristics**

The paddle is placed inside the vagina, and the wings are secured to the outside of the sheep. The retainer does not interfere with lambing and can be left in place for an extended period.

INSTRUMENT Profix or Johnson Button



• **Function**

Keeps a prolapse from reoccurring.

■ **Characteristics**

Internal fixation of preparturient vaginal prolapse in cattle that allows for normal parturition. 6-inch plastic trocar, with a 3-inch diameter plastic button, a 7-inch stainless steel pin, 2.5-inch diameter plastic washer and cotter hitch pin.

INSTRUMENT Lambing

Instrument



• Function

To help a lamb from the birth canal.

■ Characteristics

A loop is placed around the lamb's front legs, and the body is eased out as the ewe has a contraction.

CHAPTER 10

Instruments for Hoof Care



This chapter covers instruments that are used in cattle and horses to care for their hooves.



• Function

To remove debris, mud, and rocks from the hooves before examining them.

■ Characteristics

A flat-edged hook has an easy-to-grip handle. The hook part is used to dig and flip debris out of the nooks and crannies of the hoof.

INSTRUMENT Long-Handled Hoof Nippers (Squire Hoof Trimmers)



● **Function**

To rough-cut long hooves of cattle and horses while the foot is on the ground.

◆ **Common Name**

Hoof Trimmer

■ **Characteristics**

Two sharp blades are placed on 30-inch handles, which allow the user to stand at a distance and use the knees to assist in squeezing the handles together. The trimmer is used to remove large pieces of overgrown hoof so that the smaller instruments can be used to shape the hoof.

Nipper



• Function

To shape hooves to their normal size in cattle and horses.

• Common Name

Nippers

■ Characteristics

Both jaws are sharp edged, which allows the user to remove fairly large pieces of hoof. The nipper is usually used after the trimmer to form the hoof more closely to the desired shape.

Parer



• Function

To shape a hoof to its normal size in cattle and horses.

• Common Name

Parer

■ Characteristics

One jaw has a sharp edge, the other a block edge. Working much like a paring knife, this instrument can make small, precise slices into the hoof wall.

Knife



Right handed



Left handed

■ Function

To trim the frog and sole of an animal's foot.

■ Characteristics

A sharp blade on a wooden handle is used to trim away excess frog and sole after the hoof is shaped. Right- and left-handed blades are available.

INSTRUMENT Swiss Hoof Knife



■ **Function**

To trim the sole of an animal's foot.

■ **Characteristics**

An oval, sharp blade on a wooden handle is used to trim away excess sole after the hoof is shaped. A larger version is simply called an oval hoof knife.



● Function

To smooth the rough edges of the hoof wall after trimming.

◆ Common Name

Rasp

■ Characteristics

A flat piece of heavy metal has two surfaces; one is a rough surface to take down large grooves; the other is a fine surface to put the finishing touches on the smoothing of the hoof wall. The rasp is much like a wood file or a nail file for humans.

Tester



■ Function

To check through a hoof wall for abscesses or sore spots.

■ Characteristics

Two jaws are curved so they fit around a hoof; they are attached to handles. The jaws are placed on the hoof wall and sole and squeezed. If the animal reacts, the presence of an abscess is to be suspected.

Abscess Knife



• Function

To curette a small hoof abscess.

■ Characteristics

A very small, sharp loop is attached to an ergonomic handle; it clears out the area of the abscess.

Searcher



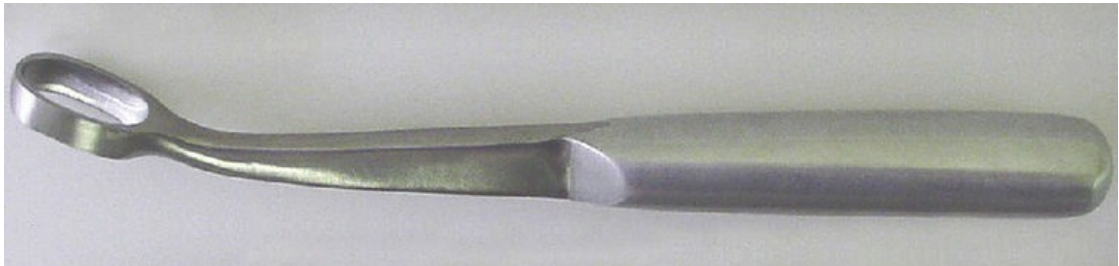
• Function

To check for holes or abscesses in the sole of an animal's hoof.

■ Characteristics

A straight probe is attached to a handle. The probe is placed into the holes to measure depth and to release the abscess.

Groover



• Function

To curette a hoof abscess.

■ Characteristics

This elliptical, doughnut-shaped blade is attached to a handle and is angled so that it can get into abscessed areas in the hoof.

INSTRUMENT Clinch Cutter



• Function

To cut the bent part of a nail that holds the shoe tightly to the foot.

■ Characteristics

This instrument has two edges that are sharp enough to cut through the nail that holds the shoe in place. A hammer is used to strike the top of the instrument.

INSTRUMENT

Combination Shoe Puller & Spreader



■ Function

Removes shoes from horse hooves.

■ Characteristics

There are sharp teeth on the outside edge for ease in spreading most shoe sizes and styles. It is also used to cut nails.

INSTRUMENT Crease Nail Puller



■ Function

Removes nails from the crease of shoes.

■ Characteristics

The jaws are designed to get into the crease of a shoe and pull out the nails holding the shoe to the hoof wall.

INSTRUMENT Easy Boot for Horses



• **Function**

Protect a hoof if injured or to use as a temporary shoe.

■ **Characteristic**

A rubber boot that fit over a horse's entire hoof. Careful measurements must be taken to get the correct size for each individual horse.

Blocks



• Function

To help a cow that has injured a hoof by protecting the injured hoof.

■ Characteristics

Hoof blocks are applied to the uninjured claw to take the weight off the injured claw. They are adhered to the hoof by a special acrylic that can also be used to fix a quarter-crack or other hoof abnormality in a horse.

INSTRUMENT Hoof Ice Boot—Horse Therapy Boot



■ **Function**

Ice or protect hooves that have been injured or strained.

■ **Characteristics**

This boot wraps around the hoof providing protection or icing from the coronary band to the toe. The ice packs are reusable and the non-slip rubber sole can be used with a pad or wedge.



■ **Function**

To protect a foot that has lost part or all of a hoof.

■ **Characteristics**

This rubber boot is designed to fit over an animal's foot and be laced up, much like a human's overshoe.

INSTRUMENT Hoof- Trimming Table and Chute



● **Function**

To put a cow into lateral recumbency so as to facilitate access to the hooves for trimming or treatment.

■ **Characteristics**

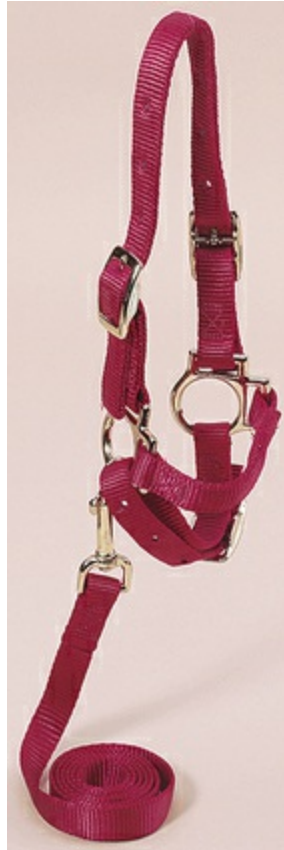
The table stands upright; the animal is placed alongside the tabletop and strapped into place. The table is then moved into a horizontal position. The animal is often sedated to keep it from struggling.

CHAPTER 11

Instruments Used in Equines



This chapter covers instruments used to restrain, treat, and care for horses.



• Function

To provide a means of controlling the horse's head while performing various procedures.

■ Characteristics

A series of leather, nylon, or rope straps is designed to go over the nose and around the neck. The halter must be fitted to the horse so that the noseband is below the cheekbones but not lower than the end of the nasal bone. The neck strap, which is placed behind the ears, should be tight but not so constrictive that it chokes the horse. It is important to be sure that the center ring, where the lead rope is

attached, is centered under the horse's chin.

Rope



• Function

To lead or tie a horse.

■ Characteristics

A leather, nylon, or rope lead that is at least 6 feet in length and has a clip at one end that is used to attach the lead to the center ring on the halter.

INSTRUMENT Chain

Shank



■ **Function**

To provide greater control over a horse by the application of mild pain.

■ **Characteristics**

A flat chain is attached to a clip at one end and to a leather, nylon, or rope lead on the other. (The arrow is pointing at the chain shank under the chin.) The clip end is brought through the side ring on the left side of the halter and over the nose and is clipped to the opposite side ring. A sharp tug on the lead makes the chain dig into the horse's nose. It should be used carefully and with much thought. It can be also used on halters for show cattle (as pictured).



■ Function

To prevent a horse from wandering far away.

■ Characteristics

Nylon or leather straps are buckled onto the front legs of the horse. They allow the horse to move but not very fast or very far. It is important to make sure that the legs are square to the body so that the horse does not fall over. Hobbles can also be used on cattle.

INSTRUMENT Twitch— **Humane**



• **Function**

To distract a horse's attention from minor procedures by inflicting mild pain.

■ **Characteristics**

Two aluminum shafts are hinged together; at the hinge is a bow that accommodates the upper lip of a horse. The upper lip is rolled and pulled through the bow; the handles are brought together and either held or clipped to the halter. The maximal time during which

this instrument is effective is 20 to 30 minutes.

Chain



• Function

To distract a horse's attention from minor procedures by inflicting mild pain.

■ Characteristics

A flat-chain loop is attached to a wooden handle. The upper lip is rolled and pulled through the loop, and the handle is twisted to tighten the chain around the lips. The handle can be rocked or loosened and tightened to add to the distraction. The maximal time during which this instrument is effective is 20 to 30 minutes.

INSTRUMENT

Cribbing Strap



■ Function

To prevent a horse from cribbing. Cribbing is when a horse sets its incisors on a fence rail and sucks in air. This is a vice that can affect the horse's endurance.

■ Characteristics

A series of straps is designed to fit around a horse's neck and chin. A strap applies pressure to the larynx only when the horse attempts to crib.

Ring



• Function

To cushion a horse's head during surgery. The ring can also be used to cushion the joints of the legs of horses, cattle, and large dogs.

■ Characteristics

A red rubber, inner-tube-like ring that, when inflated, can be positioned so that the eye or joint is in the center of the hole and the rest of the head or leg is cushioned.

INSTRUMENT Equine **Dental Halter**



■ **Function**

To provide added restraint during a dental procedure.

■ **Characteristics**

The configuration of this halter is identical to that of a fabric halter except that the noseband is metal rather than nylon. The metal is rounded and covered by leather. Metal loops at the top and bottom of the ring allow the horse's head to be tied for additional restraint or rotation.

INSTRUMENT **Equine**

Mouth Speculums

Meister, McCullum, Heiner-Rusher, Equivet



Schoupe and Meier wedge speculum

■ **Function**

To hold the mouth open during dental examination and treatment.

■ **Characteristics**

Meister, McCullum, or Heiner-Rusher, or the Equivet mouth wedge; these are metal cups that fit over the incisors and are hinged together. A ratchet device allows the mouth to be pushed open and held open. The entire apparatus is held in place by a noseband and neck strap not unlike a halter. There are a variety of other speculums that fit on one side of the jaw at a time; two of these are the Schoupe equine speculum and the Meier dental wedge.

Float



■ Function

To smooth teeth that have rough edges or are overgrown.

◆ Common Name

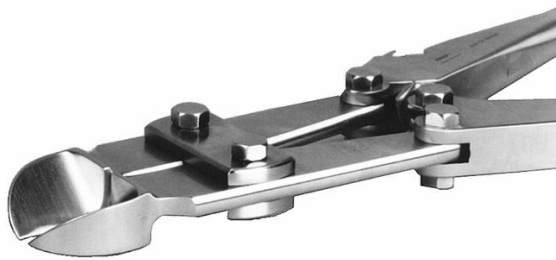
Floats, tooth floater

■ Characteristics

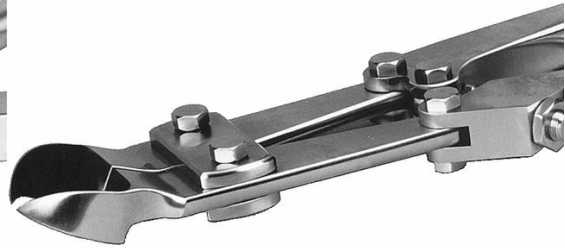
Float blades are rectangular pieces of metal that are affixed to a straight or angled handle. The blades have rough surfaces in fine, medium, or coarse grains. They can be made of carbide or of tungsten carbide chips. The angled handles facilitate reaching the various sides of a tooth. Many models can be affixed to an electric drill body, which makes the work of floating teeth easier.

INSTRUMENT **Equine**

Molar Cutter



Straight molar cutter



Curved molar cutter

• **Function**

To cut or trim molars.

■ **Characteristics**

Heavy straight or angled jaws are situated on handles that allow the user to reach to the very back molar.

INSTRUMENT **Wolftooth Elevator**



• **Function**

To loosen the ligament attachment of a tooth.

■ **Characteristics**

A tapered shaft is affixed to a handle that can withstand a strike with a mallet. The shaft is designed to slide along the surface of the tooth into the gum tissue.

INSTRUMENT Equine **Tooth Extractors**

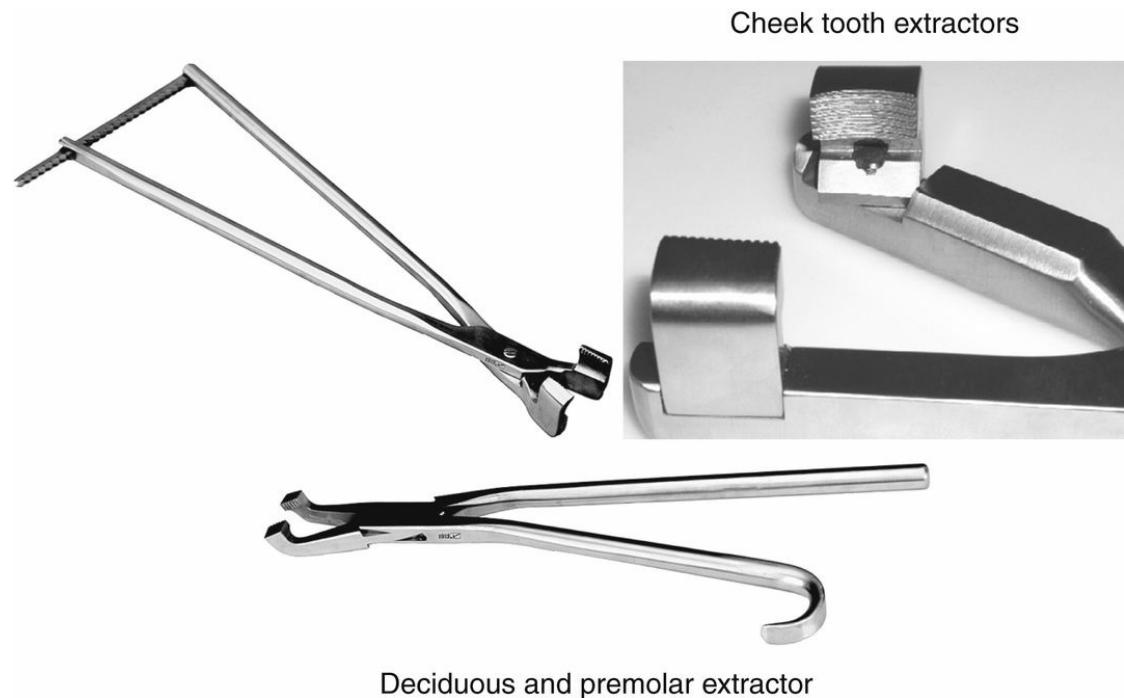


■ **Function**

To remove teeth.

■ **Characteristics**

Curved universal small-tooth-extracting forceps resembles a pair of needle-nose pliers.



■ Characteristics

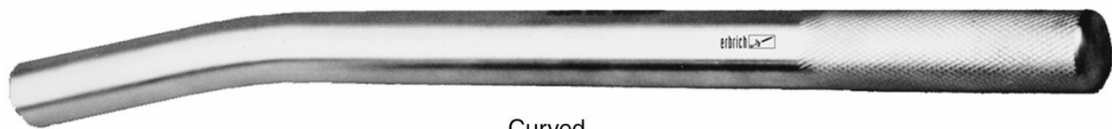
A cheek tooth extractor has a wider jaw to grip more tooth area, and it has a ratchet to hold the instrument tightly to the tooth. One jaw of the forceps swivels, allowing a number of configurations so that the user can choose the one that fits the tooth that must be extracted. A deciduous premolar-extraction forceps has blocky jaws that enable the user to maintain a good grip.

INSTRUMENT **Dental**

Tooth Punch



Straight



Curved

■ **Function**

To remove cheek teeth.

■ **Characteristics**

A hole, drilled with a trephine into the sinus cavity, allows the shaft of this instrument to be inserted over the tooth so it can be struck out.

Chisel



■ Function

To remove premolar and lower rear molar hooks.

■ Characteristics

One end has a notched V that fits around the hook. The other end has a sliding bar or percussion handle that gives extra power to the strike.

Rasp



■ Function

To give the edges a finished surface.

■ Characteristics

Tungsten carbide is found on both ends of this slightly curved and slightly bent instrument. The curves fit the contours of the tooth's surface; the bend allows the rasp to be used on upper and lower teeth.

Knife

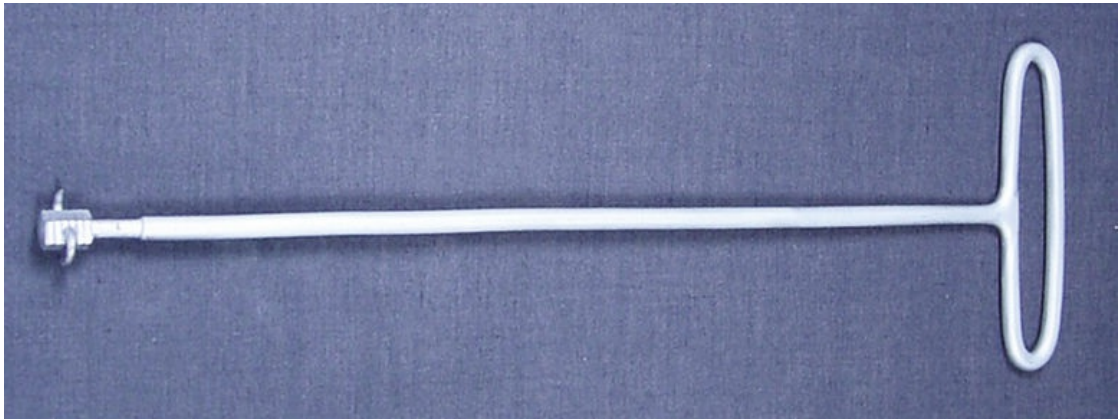


• Function

To perform a tenotomy.

■ Characteristics

A stainless-steel blade is affixed to a stainless-steel handle. The blade has a blunt or sharp point. The knife can be used without making a surgical incision.

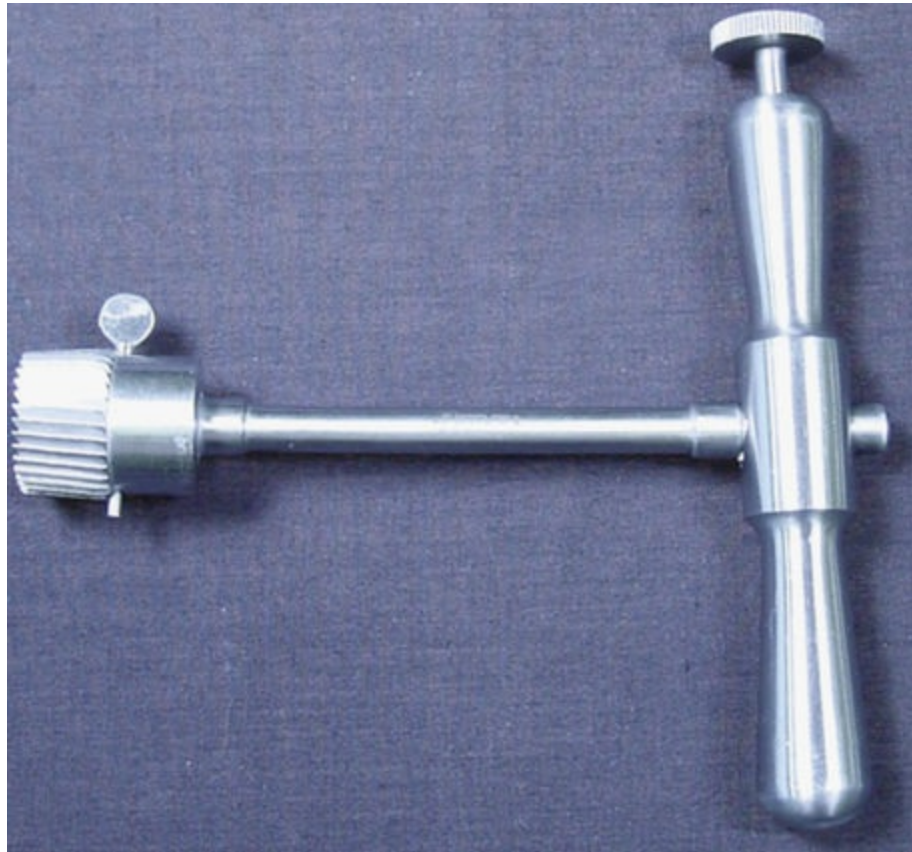
Burr**• Function**

To treat equine laryngeal hemiplegia (roaring).

■ Characteristics

A rough-surfaced knob is on the end of a shaft that has a T-shaped handle.

INSTRUMENT Trephine (Horsley's)



■ **Function**

To drill holes in the cranium or sinus cavities.

■ **Characteristics**

Sharp-angled blades are arranged in a circle on the end of a long shaft with a T-shaped handle. The blades come in $\frac{1}{2}$ -, $\frac{3}{4}$ -, and 1-inch interior diameters.

CHAPTER 12

Instruments Used for Pigs, Sheep, and Goats



These instruments are used to restrain, treat, and care for this group of animals.



• Function

To capture and hold a hog for venipuncture, injections, or other procedures.

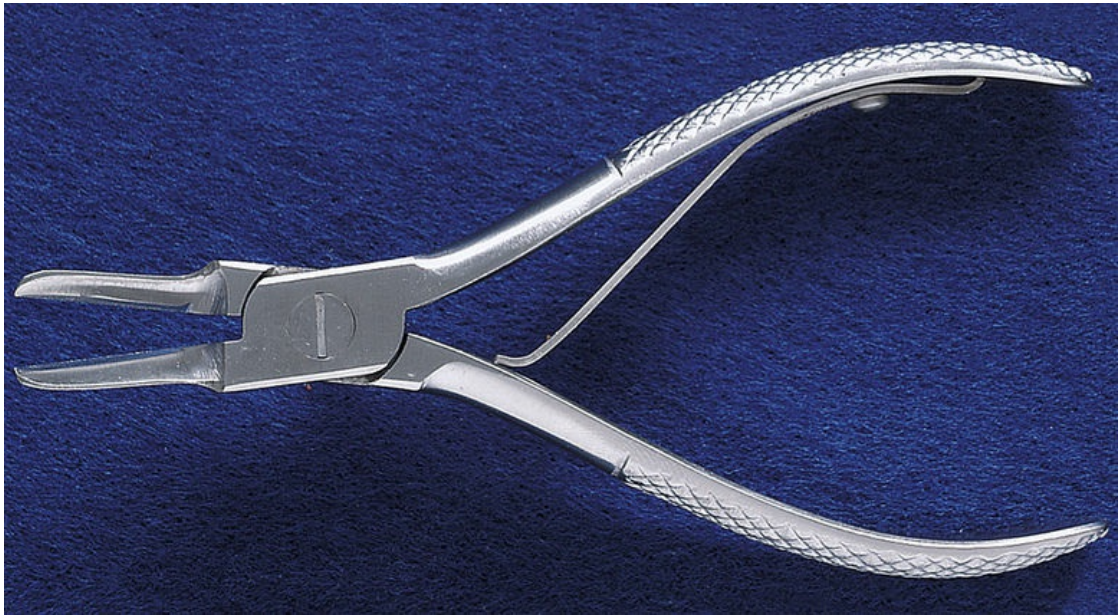
■ Characteristics

A looped cable protrudes from one end of this instrument; the other end has a handle that allows the user to tighten the loop once it is placed around the hog's upper jaw. The handler then pulls or leans back, keeping the snare taut; the pig will resist by leaning in the opposite direction. Care must be taken when releasing this instrument to ensure that it does not catch on the canine teeth.

► Note

Personnel must wear ear protection when using the hog snare because the pigs vocalize at decibels loud enough to cause hearing loss.

Pig Tooth Nipper



• Function

To clip the wolf teeth of piglets.

■ Characteristics

Looking much like the side-cutters found in most toolboxes, this sharp-jawed instrument allows the user to nip off the teeth that can cause great harm to a sow's udder.

INSTRUMENT

Hernia Clamp



• Function

To retain an umbilical hernia.

■ Characteristics

Once the hernia has been reduced, the clamp is applied and allowed to remain in place until the opening has closed and healed.

Prolapse Rings



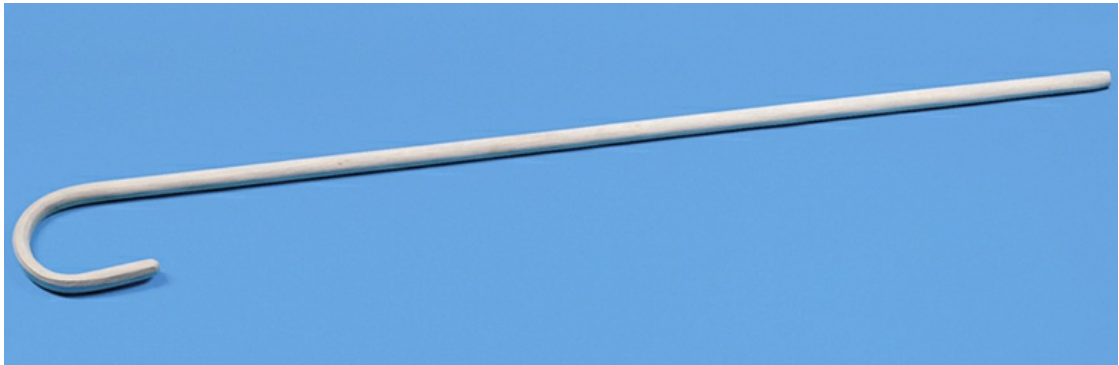
• Function

To retain rectal prolapses.

■ Characteristics

These acrylic plastic rings come in a variety of sizes to fit the diameter of the rectum. Diameters are $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, and 1 inch, all of these 2 inches long; there is also a ring that is $1\frac{1}{4}$ inches in diameter and 3 inches long.

Crook



• Function

To separate and capture sheep.

■ Characteristics

A 60-inch-long rounded staff has a large crook at one end; it is used to snag a back leg or neck to allow the handler to capture a particular sheep.

INSTRUMENT Hoof Trimmer for Sheep and Goats



• **Function**

To trim excess hoof material.

■ **Characteristics**

These shears have long blades that can easily trim one entire side of a hoof at a time. They are available with angled or straight blades and with blades that can be replaced.

INSTRUMENT Sheep-Trimming Shears



■ **Function**

To finish the trimming of sheep.

◆ **Common Name**

Sheep Shears

■ **Characteristics**

These long shears are used to put the finishing touches on the coat for shows and for quickly trimming for the purpose of wound cleaning.

Show Halter for Sheep



• Function

To maintain control of a sheep's head while showing or leading the sheep.

■ Characteristics

A headstall with either a chain shank or a cloth nose strap is attached to the sheep's head. The shank or nose strap helps to keep the animal under control.

INSTRUMENT

Sheep/Goat Chute—Deluxe Spin Doctor



• Function

To capture, hold, and treat sheep and goats of all sizes.

■ Characteristics

This chute has a front and back stop gate, a swing-away false floor, side access panels, and width adjustments to secure any sized sheep or goat. It also rolls to the side for easy access to feet.

CHAPTER 13

Restraint Equipment for Canines and Felines



This chapter covers the instruments that are used to restrain dogs and cats.

INSTRUMENT Feline

Restraint Bag



■ **Function**

To hold a fractious cat securely while a procedure is being performed.

◆ **Common Name**

Cat Bag

■ **Characteristics**

A bag into which a cat can be placed to control movement of the head and legs. Zippers allow access to the legs for venipunctures

and injections. Medications can be administered to the eyes, ears, and mouth.

INSTRUMENT Restraint **Gloves (Gauntlets)**



■ **Function**

To protect a handler from severe scratches and some bites.

■ **Characteristics**

Heavy leather gloves come with extended armbands that protect the handler's hands and forearms when handling fractious animals. These gloves or gauntlets do not keep teeth from penetrating the skin, but they do give the handler some time to get his or her hands clear before the teeth have a chance to penetrate the glove. Care must be taken when holding an animal while wearing the gloves because tactile sensation is decreased and inadvertent strangulation may occur.

INSTRUMENT Dog Snare or Capture Pole



● **Function**

To capture and secure the head of an animal so that it may be placed in a cage or run, or injected with a sedative.

■ **Characteristics**

The snare or pole is made of aluminum and has a nylon-coated cable that forms a noose. The noose can be lengthened or shortened as needed so that it slips over the head of the animal. The noose can be tightened around the neck to maintain control of the head. Most poles have a stop that prevents inadvertent choking of the animal. Animals should never be lifted off the ground by the snare, since that can cause damage to the muscles of the neck or disarticulation of the vertebrae.

INSTRUMENT Muzzles— Leather or Nylon



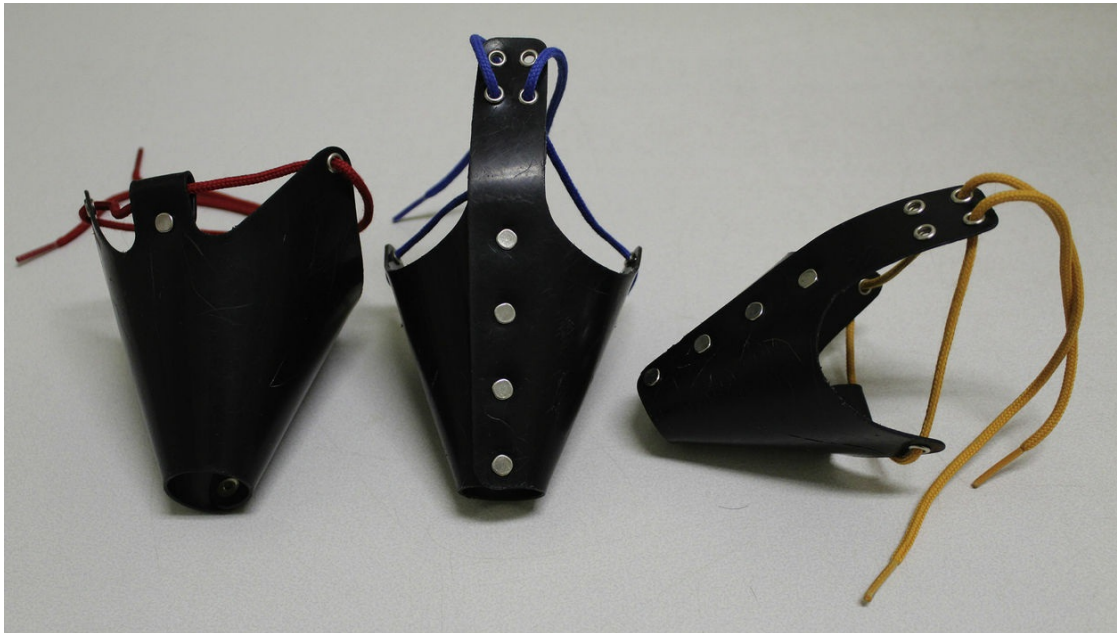
■ **Function**

To prevent an animal from biting the handler.

■ **Characteristics**

A tight-fitting strap or a cage-like apparatus is placed around the entire muzzle of the animal. The muzzle must be fitted properly on each animal. If it is not, the likelihood of the animal removing the muzzle or biting through it increases. Muzzles are made to fit cats, dogs, and ferrets.

INSTRUMENT Cone-Shaped Muzzles



■ **Function**

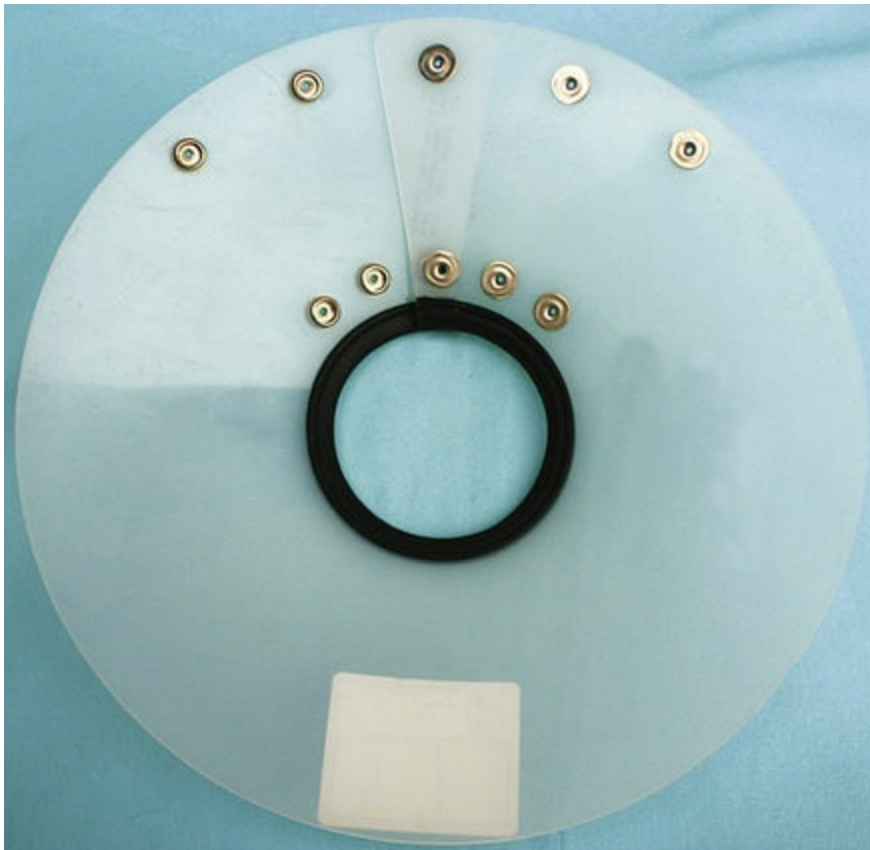
Keeps cats and small dogs from being able to bite.

■ **Characteristics**

The cone-shaped muzzle is easily slipped over a cat or small dogs head and secured by tying laces around the back of the head. The cone shades the animal's eyes and allows for easy breathing from the end of the cone.

INSTRUMENT

Elizabethan Collars



■ Function

To prevent self-mutilation and bandage destruction.

◆ Common Name

E Collar

■ Characteristics

A cone-shaped collar is custom fitted to the animal. It is important to ensure that the animal's muzzle does not extend past the edge of

the collar and that the collar is big enough to fit comfortably around the animal's neck without causing choking. Care must be taken to raise food and water receptacles to a level the animal can reach.

INSTRUMENT Neck- Brace Collars



■ **Function**

To prevent self-mutilation and bandage destruction and to prevent movement of the neck when it has been injured.

■ **Characteristics**

These tight-fitting collars encircle the entire length of the neck. It is important to ensure that they have been properly fitted (neither too long nor too short) and that the animal can reach its food and water.

CHAPTER 14

Diagnostic Imaging Instruments and Equipment



INSTRUMENT

Radiography Machine—Stationary



• Function

Produces x-rays to penetrate body structures and in turn creates an image of those structures on film or screens.

■ Characteristics

The x-rays are produced by a cathode and anode housed within a vacuum tube that is in turn housed in a height-adjustable case. Specific adjustments for kilovolts, amperage, and time are made on a console. The x-rays are focused onto a photographic film that is placed under the area of concern. The film is then processed to reveal the image produced by the x-rays.

INSTRUMENT

Radiography Machine—Digital



■ **Function**

Produces x-rays to penetrate body structures and in turn creates an image of those structures on film or screens.

■ **Characteristics**

The x-rays are still produced by stationary or portable x-ray machines. However, the image is transferred to a computer via a digital sensor. This image can be saved as a digital file.

INSTRUMENT

Radiography Machine—Dental Digital



■ **Function**

Produces x-rays to penetrate body structures and in turn creates an image of those structures on film or screens.

■ **Characteristics**

This radiography machine focuses the x-ray beam to a very narrow range. It is designed to produce digital radiographs of dental structures.

INSTRUMENT

Radiography Machine—Portable



■ Function

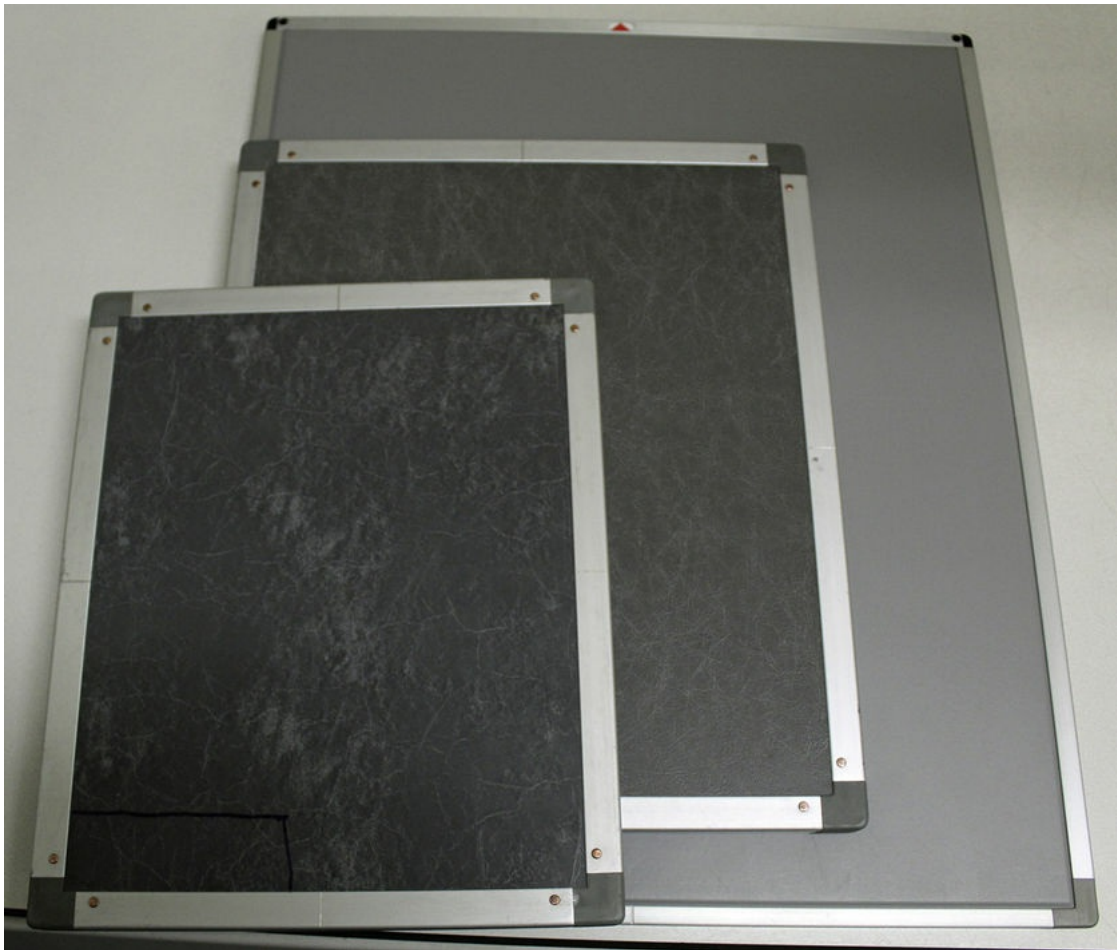
Produces x-rays to penetrate body structures and in turn creates an image of those structures on film or screens.

■ Characteristics

Same as a stationary radiography machine except it is designed to be portable for taking radiographs in the field. The tube and console are all in one easily transportable box.

INSTRUMENT

Radiography Cassettes—Film or Sensor



• Function

Houses the radiography film to protect it from light or has a built-in fluorescent screen that converts the x-rays into a digital image.

■ Characteristics

Film—The x-rays move through the body parts and leaves an

impression of the body part on the film. The film then needs to be developed in order to see the image.

Sensors are built into a cassette and the image is sent directly to a computer giving the veterinarian an instant image of the animal's body.

INSTRUMENT Digital Dental Sensor



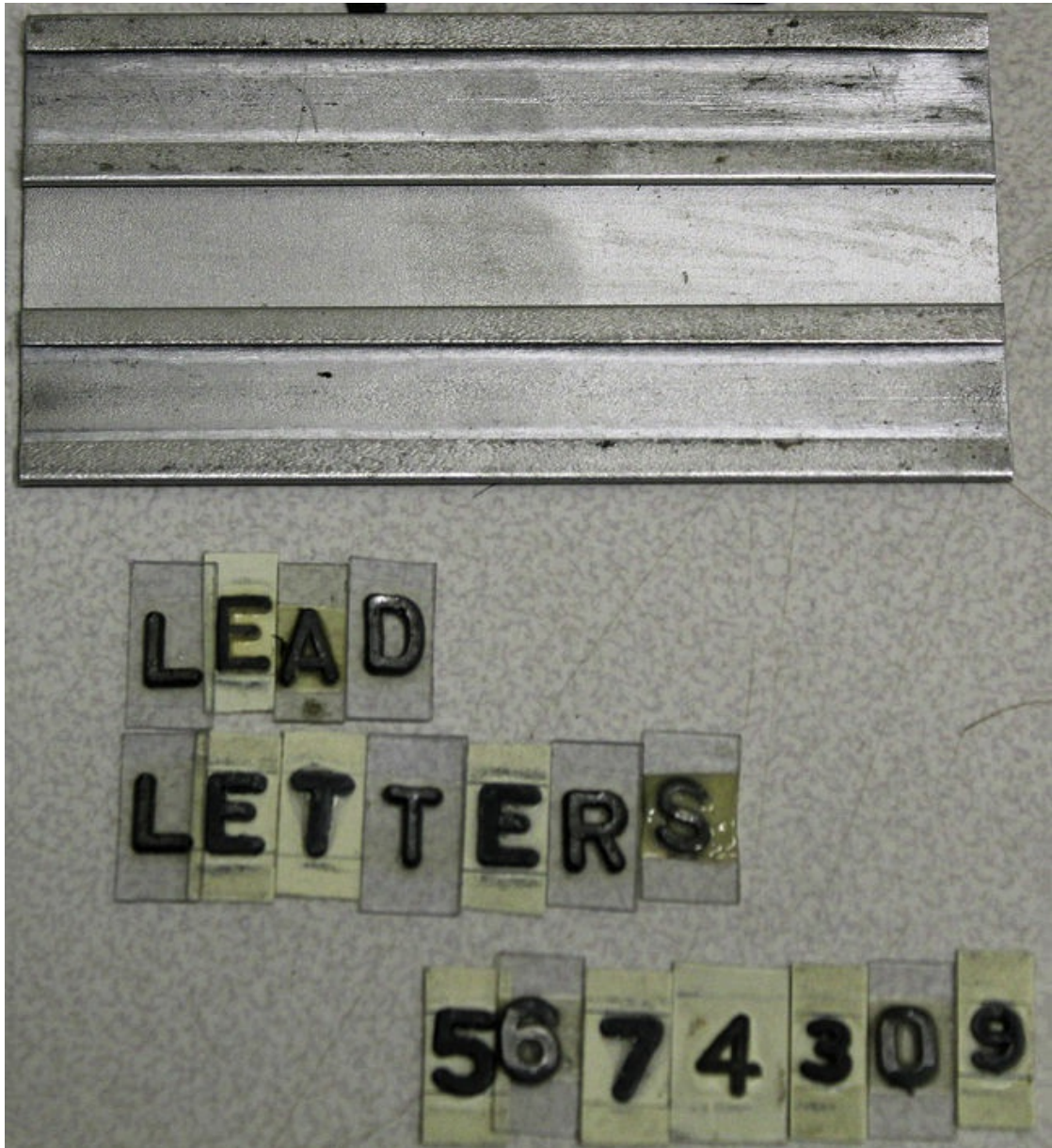
• **Function**

Used to obtain dental images.

■ **Characteristics**

The sensor is placed in various position to obtain the different dental views using a Digital Dental Radiography machine.

INSTRUMENT Lead Markers—Directional



• **Function**

Indicates left and right sides or left and right limbs on a radiograph.

■ Characteristics

Lead letters that show up white, as they block the x-rays from penetrating to the film or sensor.

INSTRUMENT Lead Letters, Numbers, and Holder



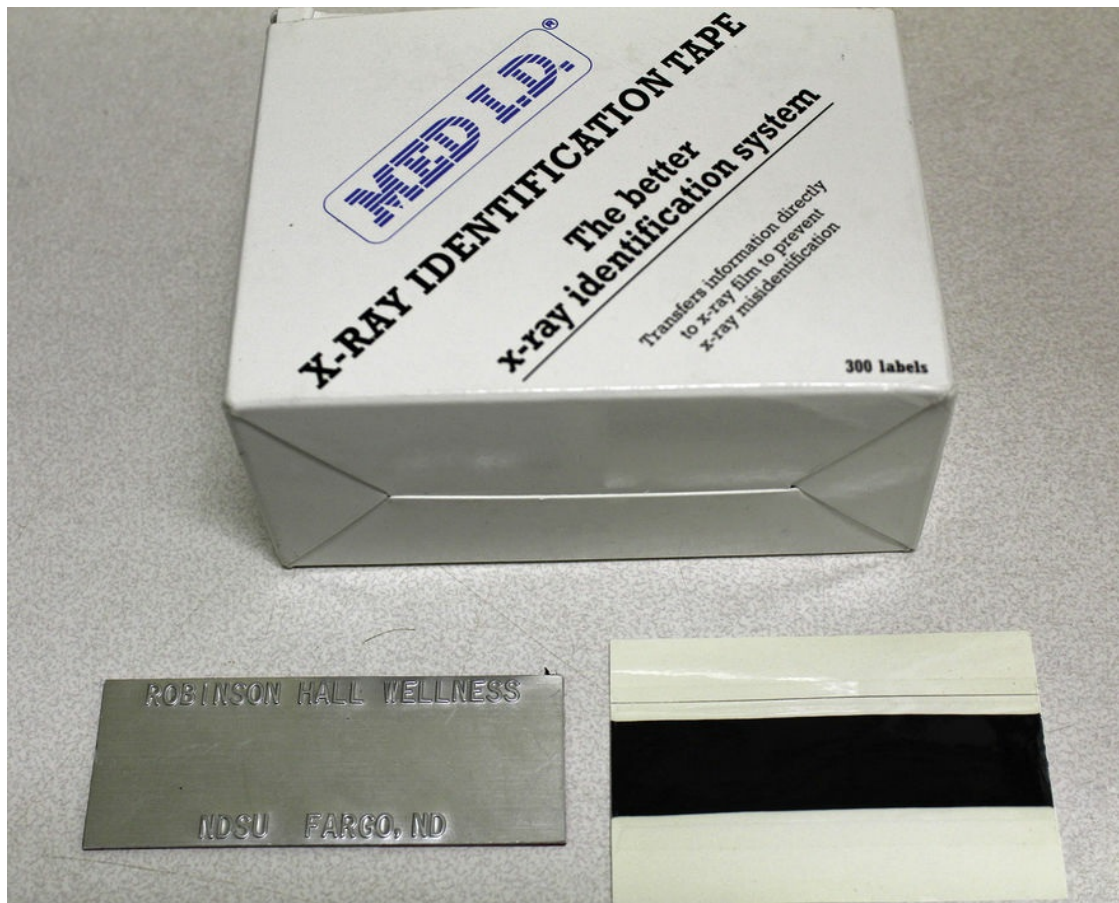
■ **Function**

Identify patient, owner, clinic, and date on a radiograph.

■ **Characteristics**

Lead letters and numbers are slid onto the holder and then placed on top of the radiographic cassette. The lead will show up white, as they block the x-rays from penetrating to the film or sensor.

INSTRUMENT **Lead Tape and Holder**



• **Function**

Identify patient, owner, clinic, and date on a radiograph.

■ **Characteristics**

The lead tape is soft, allowing letters to be written onto the tape that will show up white, as they block the x-rays from penetrating to the film or sensor.

INSTRUMENT Flasher

Labeling Unit



■ **Function**

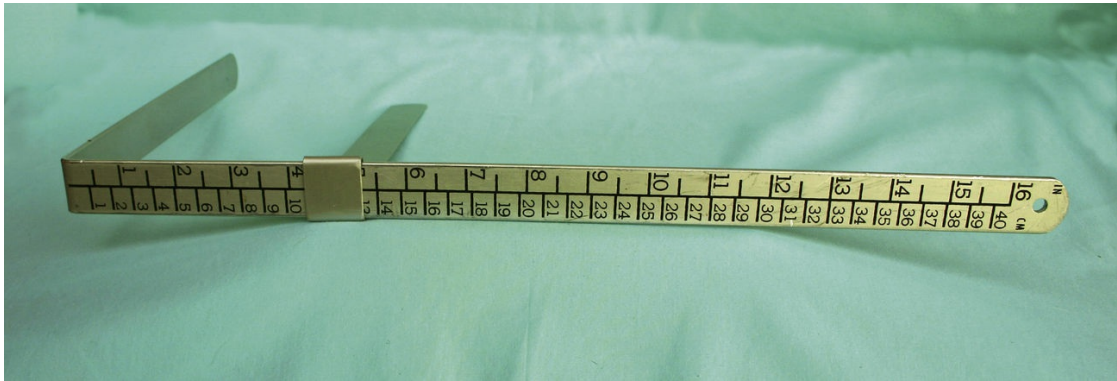
Identify patient, owner, clinic, and date on a radiograph.

■ **Characteristics**

A patient identification form is filled out, then placed in the flasher; then an exposed film is placed in the flasher and activated. An image of the label is made on the film.

INSTRUMENT X-Ray

Measuring Caliper



■ Function

To measure an animal's body parts to determine which settings to use on the radiograph machine.

◆ Common Name

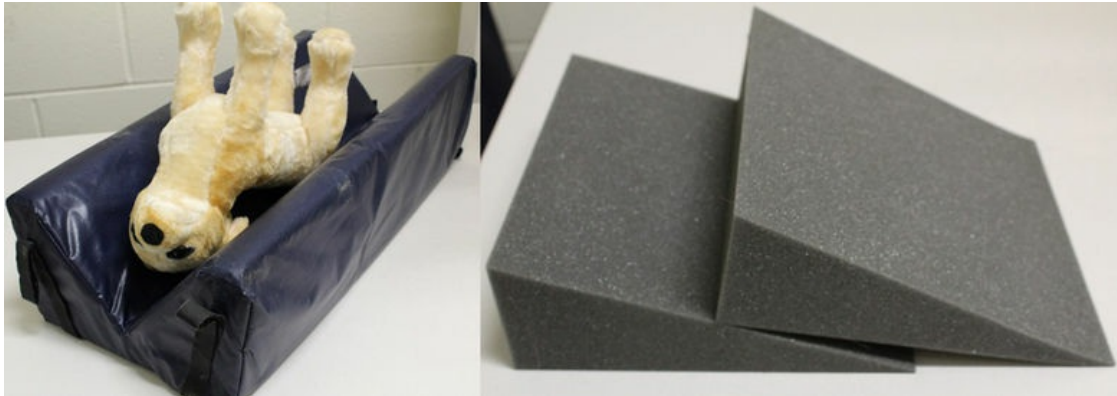
Caliper

■ Characteristics

A sliding T meets the right angle of the caliper. The thickness of the body part is indicated by the graduations on the calipers as shown by the T.

INSTRUMENT

Positioning Devices



• Function

Foam padding or troughs that help to position animals correctly for good diagnostic images.

■ Characteristics

The devices can be made of foam with or without plastic covering for easy cleaning. They may be made of moldable foam, gel or sand filled to provide hands free positioning.

INSTRUMENT Lead Apron, Gloves, and Thyroid Collar



● **Function**

To protect personnel from radiation exposure while they are taking radiographs.

■ **Characteristics**

These pieces of equipment are lined with a thin layer of lead and are worn to protect the body from absorbing radiation. Gloves, aprons, and thyroid collars are standard safety equipment.

INSTRUMENT Radiation Dosimeters



• Function

Records the amount of radiation personnel is exposed to while taking radiographs.

■ Characteristics

The badge is placed at neck or upper chest level outside of protective gear. Most badges are sent in on a monthly basis for processing and a yearly report of total exposure is sent.

INSTRUMENT

Radiography Film Processor



• Function

Develops radiographs after they have been exposed to x-rays.

■ Characteristics

The film is taken out of the cassette in a dark room and run through a series of developer, fixer, and rinse water tanks. This process takes approximately 2 minutes to produce a wet but visible radiograph.

INSTRUMENT Portable Radiography Machine Stand



■ **Function**

Holds and allows for positioning of a portable radiography machine.

■ **Characteristics**

Usually a metal stand with adjustable levers allows users to raise and lower a radiography machine and hold it steady in order to take an x-ray. Often used to assist with radiographs on livestock and horses.

INSTRUMENT

Radiographic Hoof Positioner



• Function

To position the hoof for radiographic views of the navicular bone and the third phalanx.

■ Characteristics

A heavy-duty plastic platform and an upright brace can be adjusted to facilitate five different views.

INSTRUMENT Hoof- Angle Gauge



• **Function**

To get an oblique navicular view.

■ **Characteristics**

The stand has a slot into which the toe is placed. It causes the foot to sit at a 45-degree angle. The backstop allows the heel to rest upright, keeping the angle consistent.

INSTRUMENT

Radiographic Cassette Holder



• Function

To hold radiographic cassettes at any angle while keeping personnel out of the direct beam.

■ Characteristics

A series of clamps is used to hold the film cassette onto a long pole or poles. The cassette can be maneuvered into position behind, to the side of, or between the legs.

INSTRUMENT

Ultrasound—Wireless and Portable



■ Function

Performs ultrasounds on patients.

■ Characteristics

Using high-frequency sound waves to make images of internal body structures, such as fetuses, abdominal organs, muscles and tendons, or heart and blood vessels.

CHAPTER 15

Anesthesiology and Surgical Suite Equipment



This equipment is an essential part of the surgery suite.

INSTRUMENT

Laryngoscope Handle



• Function

To hold laryngeal speculums.

■ **Characteristics**

These handles are designed to hold laryngeal speculums and provide their light source with power. There are two sizes; one requires two C batteries, the other two AA batteries.

INSTRUMENT Macintosh

Laryngeal Speculum



• Function

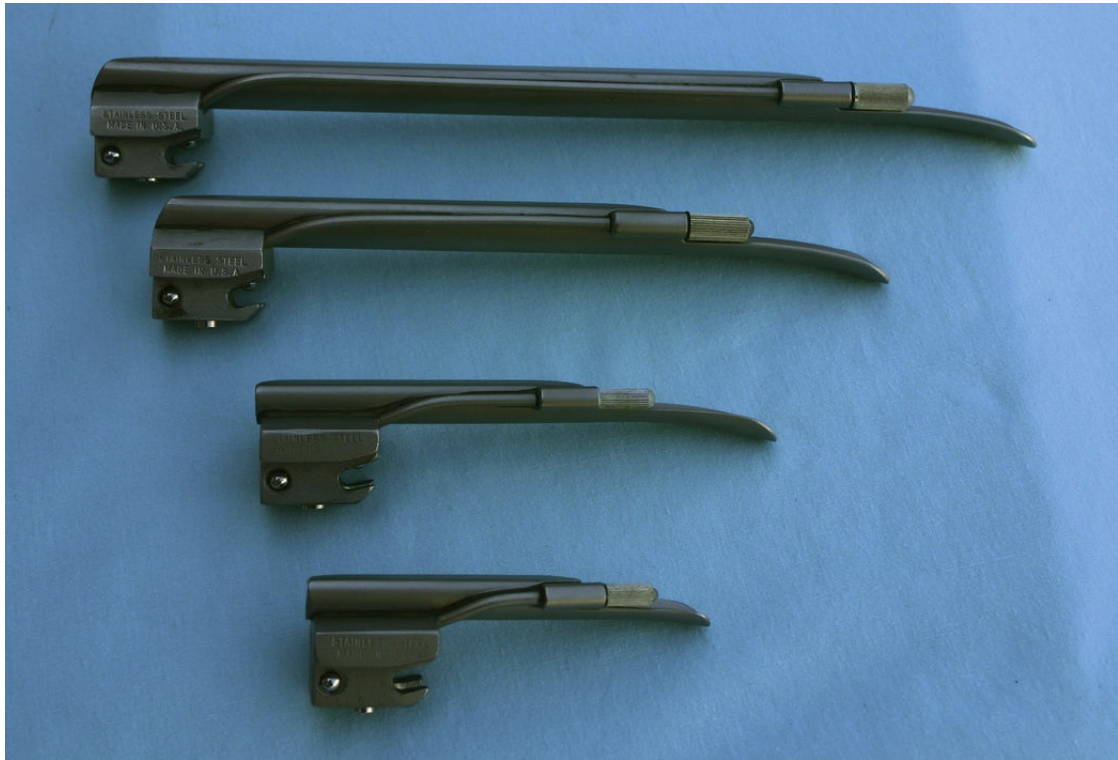
To expose the tracheal opening by placing pressure in front of the epiglottis.

■ Characteristics

This speculum has a curved blade with a flat end. The light source is located at midshaft. The speculum is available in sizes ranging from #0 to #4; #4 is the longest.

INSTRUMENT **Miller**

Laryngeal Speculum



■ **Function**

To expose the tracheal opening by pulling the epiglottis down.

■ **Characteristics**

This speculum has a straight blade with a rounded end. The light source is a quarter of the way from the end of the speculum. It is available in sizes ranging from #0 to #4; #4 is the longest.

INSTRUMENT

Sphygmomanometer



● Function

To determine blood pressure.

◆ Common Name

Blood Pressure Cuff

■ Characteristics

A cuff is wrapped around the patient's leg, then inflated by use of

the bulb until no sounds can be heard from the dorsal pedal artery. The manometer is slowly released by opening the valve. The first sound heard is the systolic pressure number. When the sound becomes a pronounced beat, the number indicated is the diastolic pressure. The diastolic number is not as accurate as the systolic number because of the variance in examiners' hearing.

INSTRUMENT Doppler Ultrasonic Blood Flow Monitor



■ **Function**

To determine blood pressure.

◆ **Common Name**

Doppler

■ **Characteristics**

The probe is lubricated and secured to shaved skin over an artery. The Doppler picks up the wave ultrasonically as the blood wave

passes.

INSTRUMENT **Pulse Oximeter**



● **Function**

To monitor pulse and respiration rates, as well as oxygen saturation and body temperature, during surgery.

◆ **Common Name**

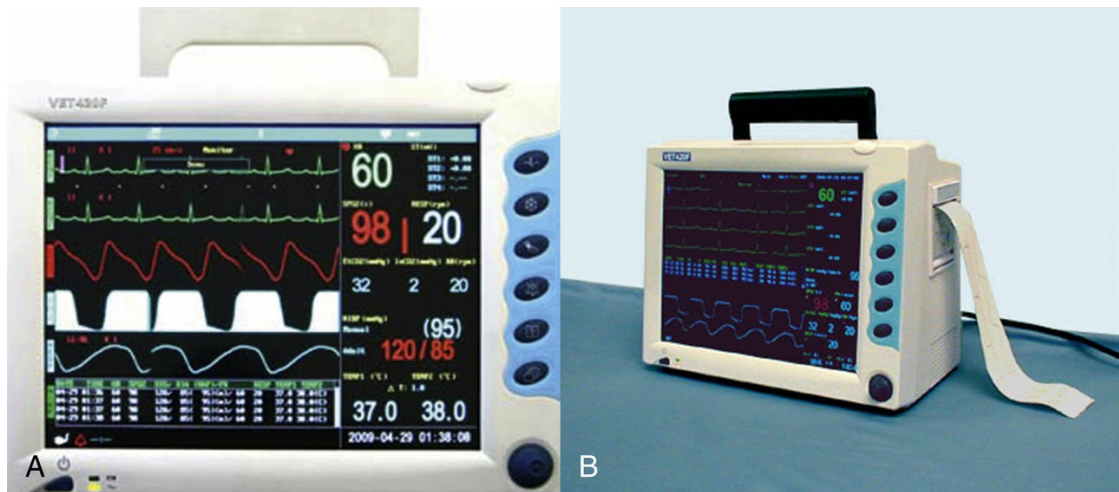
Pulse Ox

■ **Characteristics**

A clamp-like device is attached to the tongue or between the toes if the feet are white; it monitors pulse rate and arterial oxygen. Some machines have rectal probes that register the pulse rate; they are useful when dental work is involved. The respiration rate is monitored by a temperature sensor that is placed inside an attachment that connects with the endotracheal tube. As the animal

exhales or inhales, the temperature of the air is taken and that is recorded as a breath. Another attachment to the oximeter records body temperature; a small flexible probe is inserted into the rectum. The oximeter provides an average pulse rate rather than a real-time pulse rate, so checking it manually on occasion is advisable.

INSTRUMENT **Multi-Parameter Monitor**



■ **Function**

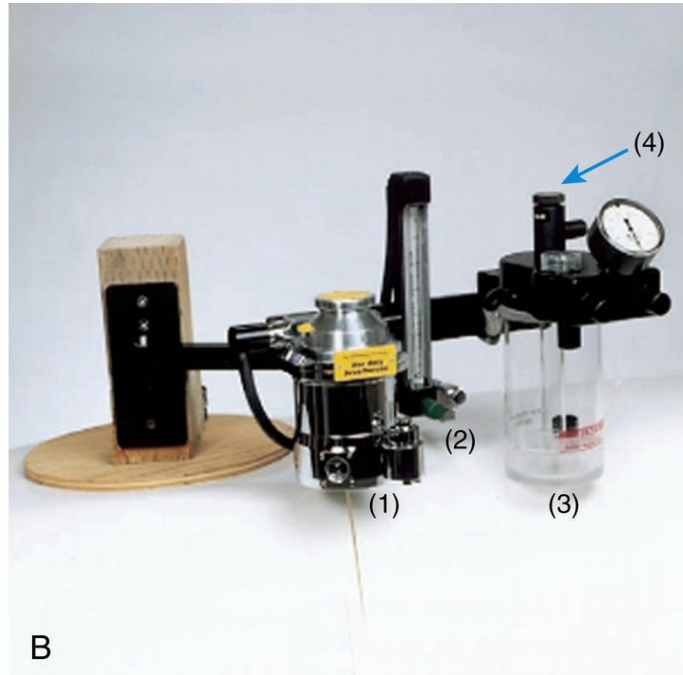
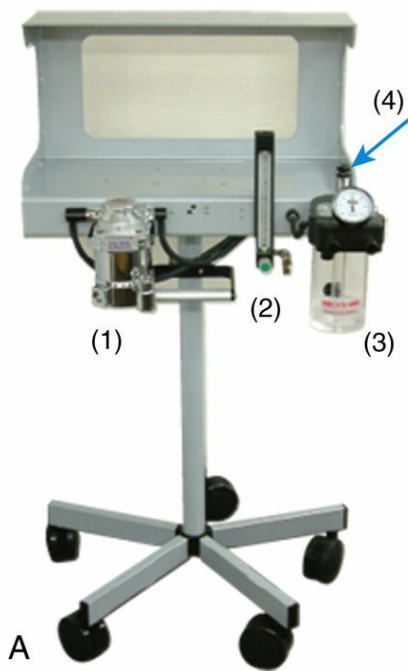
An instrument used to gather the vital signs from a patient during an anesthetic procedure.

■ **Characteristics**

The multi-parameter monitor records temperature (T), pulse (HR or PR), respiration (R), oxygen saturation (SPO₂), blood pressure (BP and MAP), electrocardiogram (ECG), and end-tidal carbon dioxide (EtCO₂). The screen produces a digital image of each parameter and, depending on which leads are used, will produce fairly reliable results. Each parameter is labeled with the most common abbreviation.

INSTRUMENT Gas

Anesthesia Machine



■ Function

Equipment used to induce and maintain anesthesia.

■ Characteristics

A is an anesthesia machine on a stand for portability and B is a wall-mounted machine. Both have a (1) vaporizer that mixes the anesthetic agent with oxygen and vaporizes it so it can be inhaled, (2) an oxygen flow meter that is set to deliver the appropriate level of oxygen to a patient, (3) a soda lime canister to absorb carbon dioxide from the exhaled breaths and (4) a pop-off valve and scavenger port to allow excessive gas to be vented and waste gases to be piped from the surgical suite.

INSTRUMENT Inhalation Chamber



• **Function**

To deliver anesthetic gas to an animal too wild or ferocious to handle. It can also be used as a temporary oxygen chamber.

■ **Characteristics**

A Plexiglas or glass chamber has a lid that allows the attachment of tubes from a gas anesthesia machine. The animal is placed inside, the lid is secured, and the hoses from the gas anesthesia machine are attached. The animal is left in the chamber until it is unconscious.

INSTRUMENT

Anesthesia and Oxygen Masks



■ Function

To deliver anesthetic gas or oxygen only to an animal that can't be intubated.

■ Characteristics

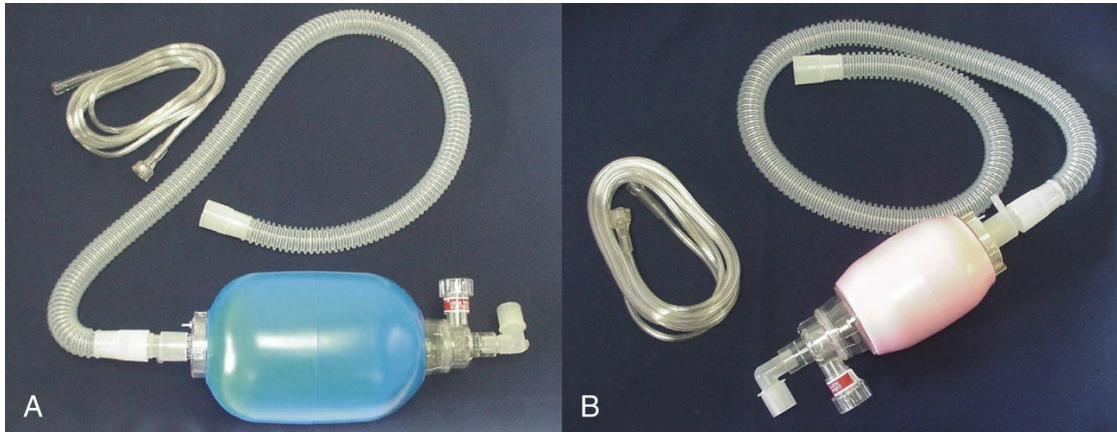
A and B are anesthesia masks that are made to fit over an animal's muzzle. A has a rubber gasket that provides a tighter fit than B. However, both will leak, allowing gas anesthesia to flood into the surgical suite. Therefore they are not usually used extensively in practice. All three can be used as oxygen masks. However, C allows for room air to mix with the oxygen, which may be a requirement

for the animal. Because C is vented, it can be used as a muzzle as well.



B



A
Large Ambu bagB
Small Ambu bag

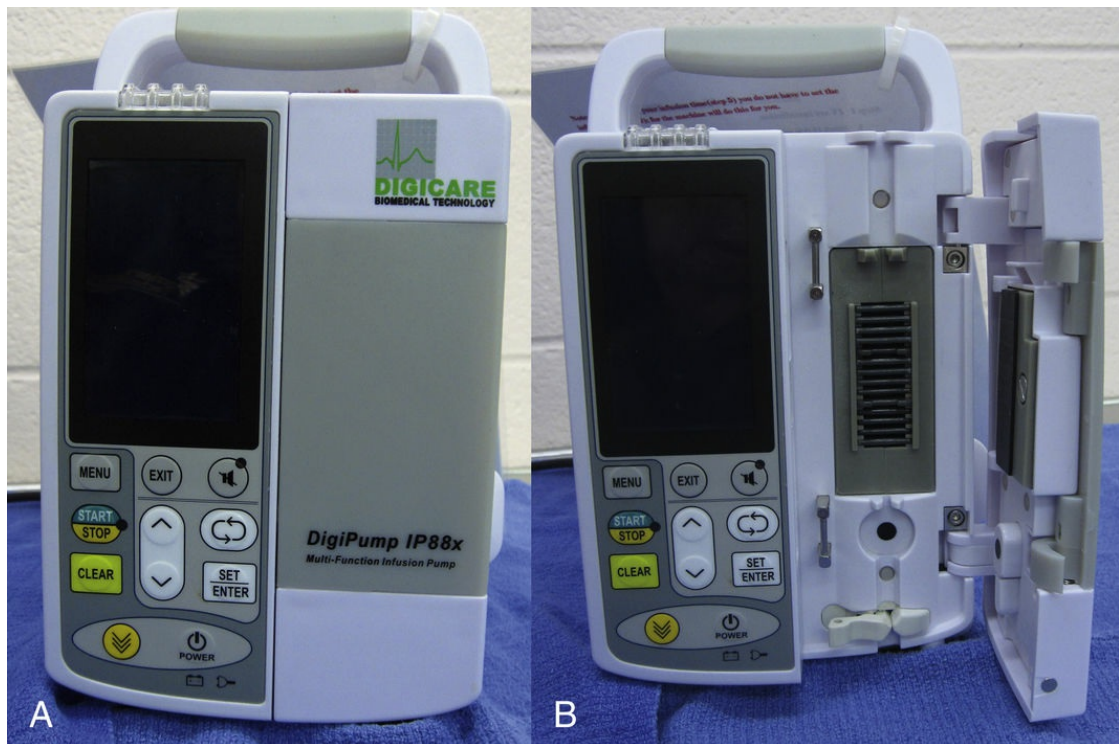
■ Function

To deliver room air or oxygen from a tank to a patient in respiratory distress.

■ Characteristics

Usually used when an endotracheal tube is in place. The large bag is squeezed, forcing room air into the lungs. Bags of various sizes are used, according to the size of the patient.

INSTRUMENT Infusion Pump



• Function

To mechanically regulate the flow of fluids into a patient.

■ Characteristics

Intravenous tubing is threaded through the machine, which is then programmed to deliver the dose. The user enters the amount of fluid necessary and the time during which it must be delivered. Some models have warmers that keep the fluids above room temperature, a feature that makes their delivery more comfortable for the patient.

INSTRUMENT

Intravenous Stand



● **Function**

To hold bottles and bags so that gravity can deliver intravenous fluids.

◆ **Common Name**

IV Stand

■ **Characteristics**

A stainless-steel stand with two or more hooks that hold bags or bottles of fluid. The shaft of the stand is usually adjustable, and the stand usually has wheels.

▶ **Note**

The IV stand can also be used to elevate a limb that needs to be prepped for surgery. A length of roll gauze is tied to the foot on the affected limb, then elevated and tied to the IV stand. This allows the technician to shave and scrub the entire circumference of the leg and move the patient into surgery without contaminating the surgical site. The surgeon grasps the leg with sterile stockinette partially unrolled, the technician cuts the gauze close to the foot, and the surgeon covers the entire foot with the rest of the stockinette.

INSTRUMENT

Surgical Table



■ Function

Provides a stable and clean surface on which to perform surgeries.

■ Characteristics

There are two types of stainless-steel surgical tables. One type (A) can be positioned in a V to keep the patient from rolling from side to side or left flat to accommodate an animal laying on its side. This table has a trough under the center of the table to catch fluids. The second (B) has a flat top that is slightly bowed so that fluids will run to the sides and then into a drain hole at one end. Both have a hook at one end to hold a bucket that can catch fluids so they do not

splatter on the floor. Both have either a friction tie-down or a cleat on the four corners that allow ropes to be attached to secure a patient to the table. Both tables can be raised and lowered by a hydraulic foot pump and tilted in either direction. Some units will come with hot cold.



INSTRUMENT

Instrument Stand



■ **Function**

To provide a stable surface for the placement of surgical instruments during a procedure.

■ **Characteristics**

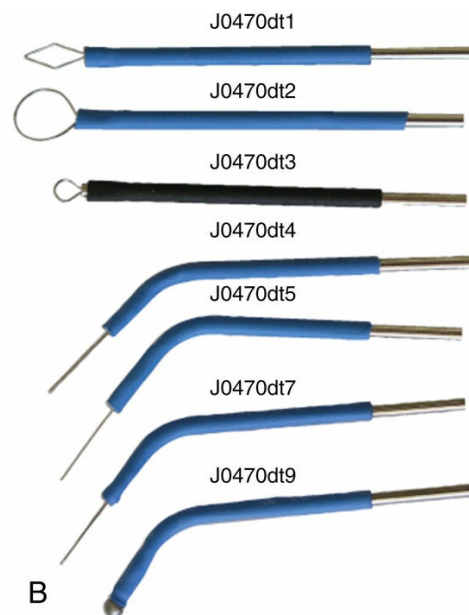
This stand has a gooseneck shape so that it can be moved to the surgical table from the end or the sides. The height is adjustable.

INSTRUMENT

Electrosurgical Generator



A



B

Function

To act as part of an electrocautery unit.

Characteristics

This is one of many types of electrosurgical units that can be used to cauterize during a surgical procedure and/or to remove surface tumors. There are a variety of tips available for different procedures.

Endoscope



• Function

To view the gastrointestinal tract via the oral cavity or rectum or to view the reproductive tract via the vagina. It is also used to perform

surgery, biopsy, or culturing through a small incision that allows access to other body cavities.

INSTRUMENT Surgical Suction Pump



■ **Function**

A device used to remove fluids, tissues, and gases from the surgical patient during surgery.

■ **Characteristics**

This is usually a small motor mounted on a wheeled base with a canister or jar attached to it as a collection device. A small hose with a sterile suction tip is attached to the collection jar. The sterile tip is used to collect the fluids and gases during the surgical procedure. After the procedure, it can be used to collect any fluids that may have run into the collect trough or pail under the surgery table.

INSTRUMENT Yankauer and Frazier Suction Tips



■ **Function**

To suction fluids out of surgical fields.

■ **Characteristics**

The Yankauer (bottom instrument) is considered a universal tip. Both suction tips can be attached to a device that suctions the aspirated fluids and carries them to a storage container.

INSTRUMENT Warming Units



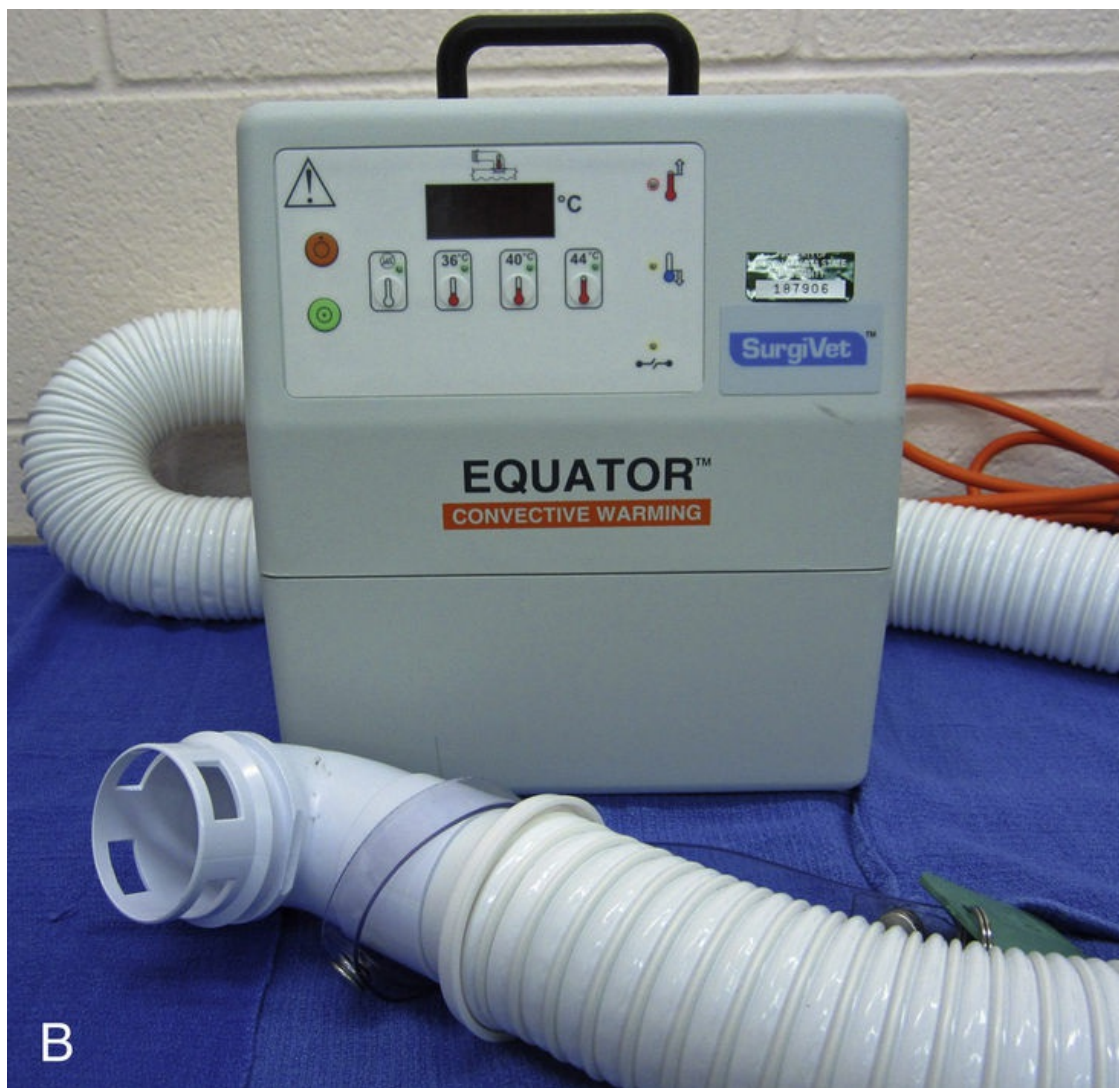
■ Function

Used to maintain or warm a patient's body temperature.

■ Characteristics

(A) **Warming Blankets.** The “Hot Dog” Patient Warming System uses a blanket attached to a generator. The patient is laid directly on the blanket. Another type of blanket system uses a circulating

pump, which pumps warm water through a blanket that the patient is laid on. (B) **Convective Warming.** “Equator” and “Bair Hugger” are two brand-name warming devices that blow warm air into a special blanket on which the patient can be laid; the blanket can also be laid over the patient’s body. (C) **Towel Warmer.** The “Comfort Zone” towel warmer is a fairly portable device that will warm three to four large towels in about 15 to 20 minutes. These are fine to use; however, the towels tend to cool off quickly.





Buckets



■ **Function**

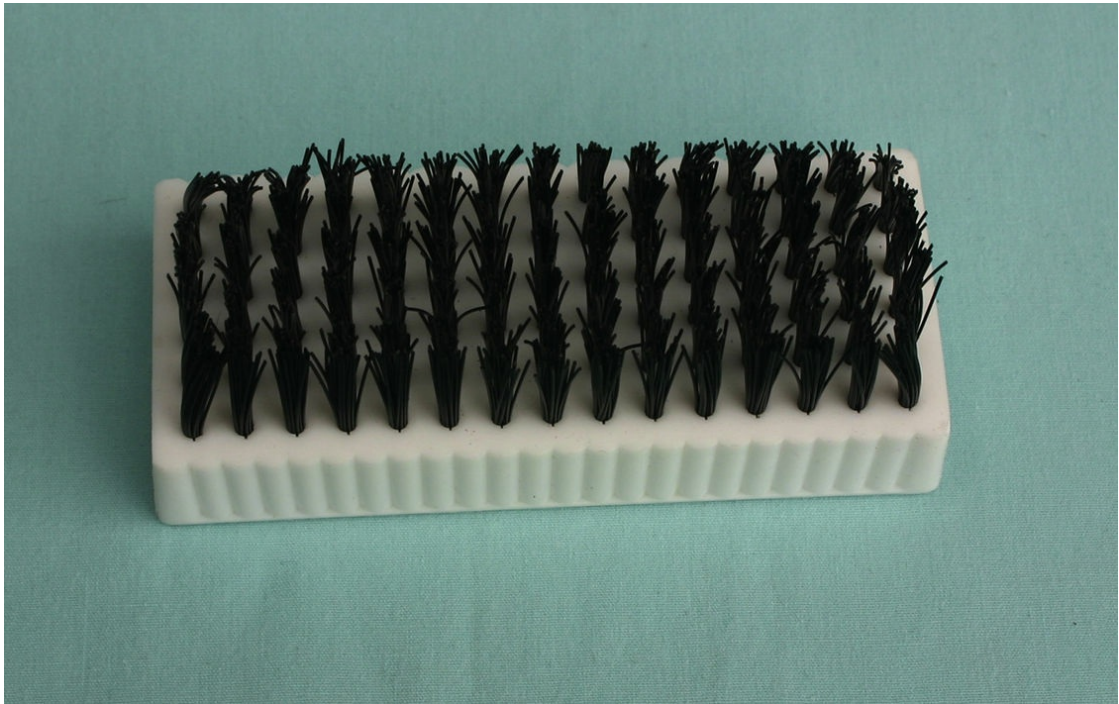
To hold garbage generated during surgery.

■ **Characteristics**

Stainless-steel buckets are placed on wheels so a foot can push them

easily from one area of the surgery room to another. Because they are stainless steel, they can be disinfected or sterilized easily.

INSTRUMENT Surgeon's Scrub Brush



• **Function**

To scrub a surgeon's hands and arms in preparation for surgery.

■ **Characteristics**

A medium- to hard-bristled brush on an autoclavable handle.



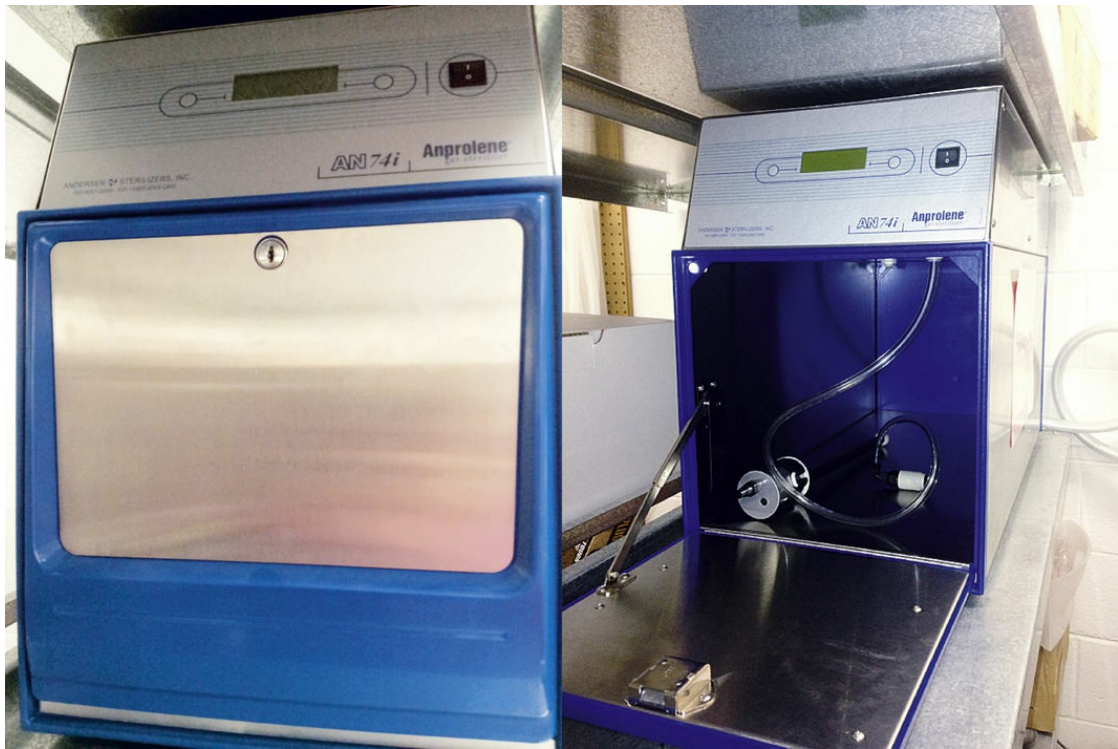
• Function

A device used to render objects sterile by steam, heat, and pressure.

■ Characteristics

The autoclave consists of a chamber in which specially wrapped objects are placed, a heavy door to seal the chamber, and a water source to create the steam. The water source should be distilled because regular tap water leaves mineral deposits that will cause the equipment to fail at some point and will cause the instruments being sterilized to become corroded. Each brand of autoclave works a bit differently, so it is best to read the owner's manual or get training on the one in your facility before using this equipment.

INSTRUMENT Gas Sterilization Chamber



■ Function

A device used to render objects sterile by exposure to chemicals.

■ Characteristics

Ethylene oxide is used to sterilize objects that can be damaged by steam and pressure. It is a highly toxic gas and so must be used with extreme caution. Again, each brand works a bit differently, so it is best to read the owner's manual or get training on the one in your facility before using this equipment.

INSTRUMENT Bard-Parker Sterilizer Tray



• **Function**

To hold instruments for cold sterilization.

■ **Characteristics**

A glass, plastic, or metal tray holds instruments while they are soaking in a cold-sterilization solution. Many have a tray that can be lifted up and set so that the solution runs off and the surgeon does not touch the solution itself. This prevents accidental contamination of the solution.



INSTRUMENT Needle-Sterilizing Rack



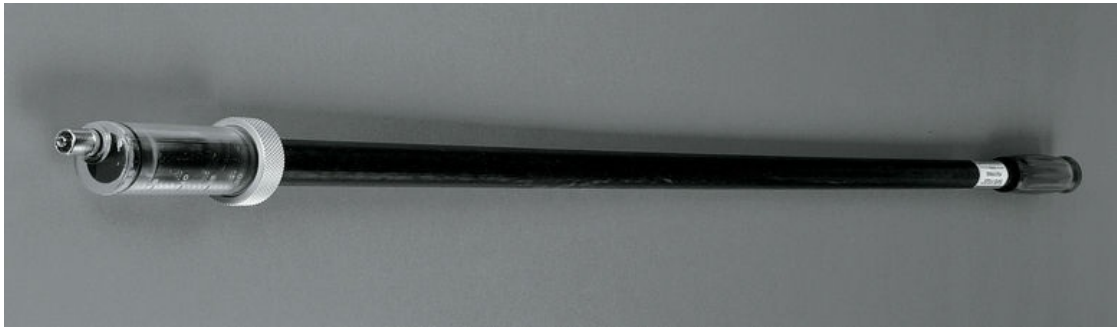
• **Function**

To hold suture needles in an orderly fashion.

■ **Characteristics**

A spring held in place by a track is used as a means of separating suture needles into size and type. The rack is placed in a cold-sterilization solution, or it can be included in a surgical pack, which ensures that the needles do not inadvertently penetrate the wrapping material.

Syringe



■ Function

To administer a parenteral injection to an animal too wild or ferocious to handle.

■ Characteristics

The plunger of a syringe is attached to a long pole. A regular syringe is taken apart, and the barrel is attached to the plunger of the pole syringe. The syringe is filled in the normal way, and the handler uses the pole to insert the needle and push the plunger from a safe distance. The plunger section can be changed to accommodate various syringe sizes. These are often used to administer an anesthetic.



• **Function**

To propel a dart syringe toward an animal that is too wild or ferocious to handle.

■ **Characteristics**

This hollow tube is designed to accommodate a special syringe that flies, by air propulsion, and discharges on impact. The tube usually has a mouthpiece on one end. Often used to administer an anesthetic to animals from a safe distance.

PART 2

Surgical Instruments

OUTLINE

- Chapter 16. Hemostats and Forceps
- Chapter 17. Instruments in Surgical Packs
- Chapter 18. Needle Holders and Scissors
- Chapter 19. Retractors and Rib Spreaders
- Chapter 20. Orthopedic Instruments
- Chapter 21. Ophthalmic Instruments
- Chapter 22. Dental Instruments
- Chapter 23. Teat Instruments
- Chapter 24. Surgical Instrument Packs
- Chapter 25. Care of Instruments

CHAPTER 16

Hemostats and Forceps



Hemostatic forceps, also known as hemostats and clamps, are generally used to grasp blood vessels or to clamp and hold tissue or vessels. The instruments vary in length from 3 to 9 inches and have grooved jaws that give them holding and crushing power. The grooves on most hemostats traverse the length of the jaws, a few have grooves running longitudinally, and a few have a combination of grooves. Each is equipped with a ratchet or box lock that allows the instrument to be locked and left in place, and all hemostats are available with either straight or curved jaws. The selection of size is determined by the size of the blood vessel or tissue bundle to be clamped.

INSTRUMENT **Hartman**

Mosquito Forceps



● **Function**

To clamp or occlude small capillaries or vessels that have been cut or are about to be cut.

◆ **Common Name**

Mosquito

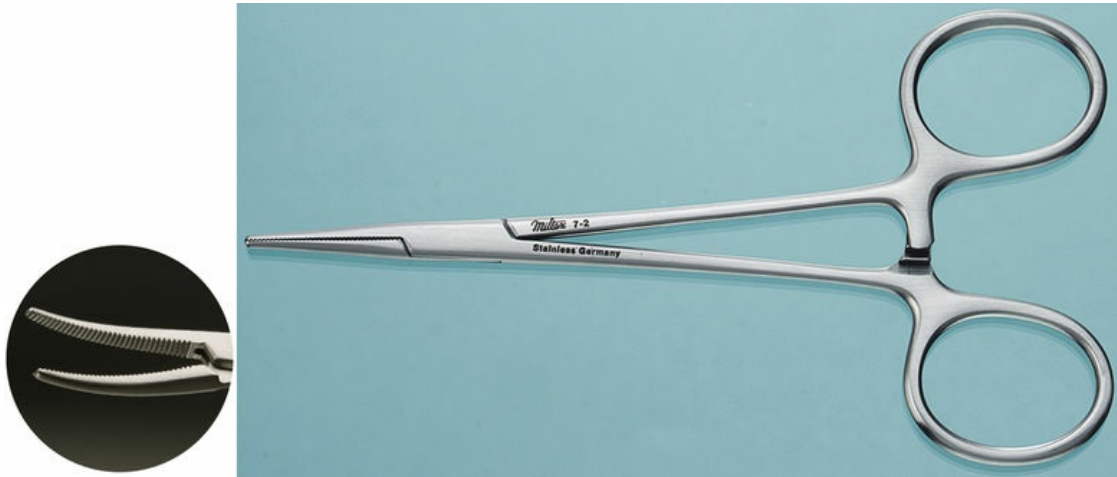
■ **Characteristics**

A forceps 3½ inches long has transverse grooves on the entire jaw.

► **Note**

It is sometimes referred to as a mosquito because it is the smallest hemostat with a box lock.

INSTRUMENT **Halsted** **Mosquito Forceps**



■ **Function**

To clamp small vessels that must be occluded, crushed, or held firmly in place.

◆ **Common Name**

Mosquito

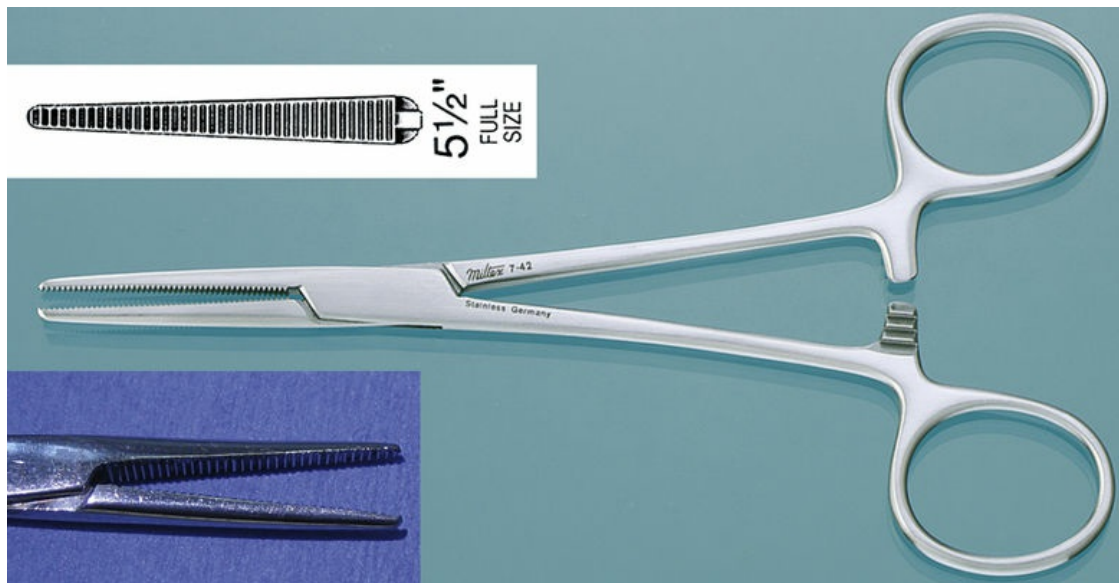
■ **Characteristics**

A forceps 5½ inches long has transverse grooves on the entire jaw.

► **Note**

The most commonly used small hemostat in surgical packs for dogs and cats.

Forceps



• Function

To occlude vessels such as small uterine horns or small-to medium-sized blood vessels.

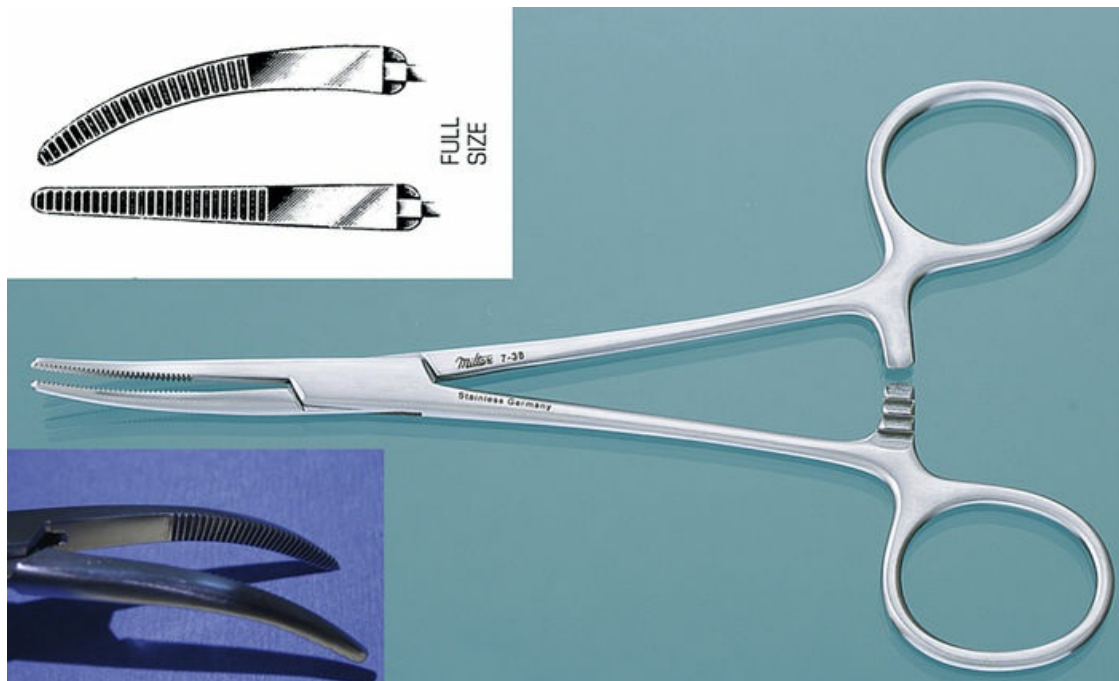
■ Characteristics

A forceps $6\frac{1}{2}$ or $7\frac{1}{4}$ inches long has transverse grooves on the entire jaw.

► Note

One of the most commonly used large hemostats in surgical packs for dogs and cats.

Forceps



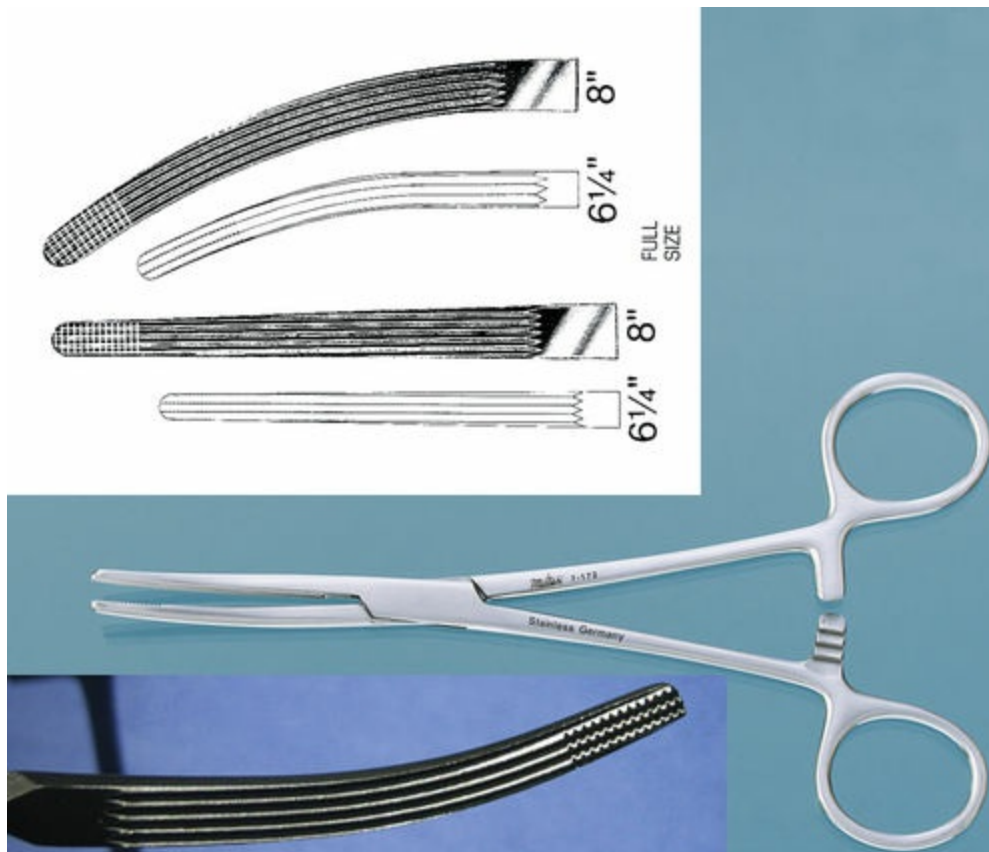
• Function

To occlude small-to medium-sized vessels.

■ Characteristics

A forceps 6½ inches long has transverse grooves only on the top half of the jaws; the lower half is smooth. The smooth area allows the user to clamp tubing without worrying that the tubing will be cut.

INSTRUMENT **Rochester Carmalt Forceps**



• **Function**

To clamp large tissue bundles that have a lumen or contain blood vessels. When the instrument is placed perpendicular to the blood vessel, it occludes the vessel and prevents the blood from flowing. The other hemostats with their transverse grooves can allow blood or body fluids to continue flowing.

• **Common Name**

Rochester

■ Characteristics

The first quarter of the jaws has grooves that run both longitudinal and transverse; the other three-quarters of the jaws have longitudinal grooves only. The tips of the jaws can be used to grasp and crush tissue, whereas the lengthwise grooves allow the user to slip the hemostat off after ligation. For small animals, these forceps are 6¼ to 8 inches long; those used in large animals may be as long as 12 inches.

INSTRUMENT

Rochester-Péan Forceps



■ Function

To clamp blood vessels or to control large tissue bundles.

■ Characteristics

The jaws of these forceps have transverse grooves that provide good crushing action. Their lengths are 6 1/4 to 8 inches.

INSTRUMENT

Rochester-Ochsner Forceps



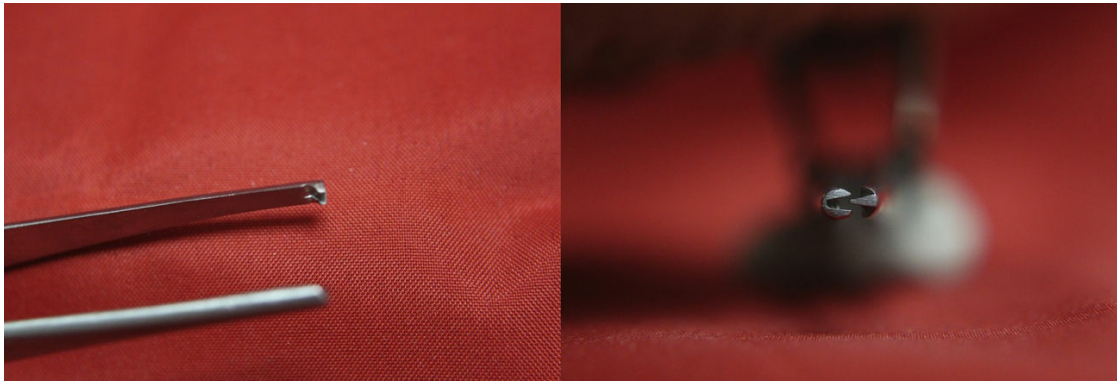
● Function

To clamp blood vessels or to grasp tissue.

■ Characteristics

The jaws have transverse grooves that provide good crushing action. The tips of the jaws have teeth that are 1×2 , like a tissue forceps. The teeth on the tips prevent slippage of large tissue bundles. These forceps are $6\frac{1}{4}$ to 8 inches long.

INSTRUMENT **Ferguson** **Angiotribe Forceps**



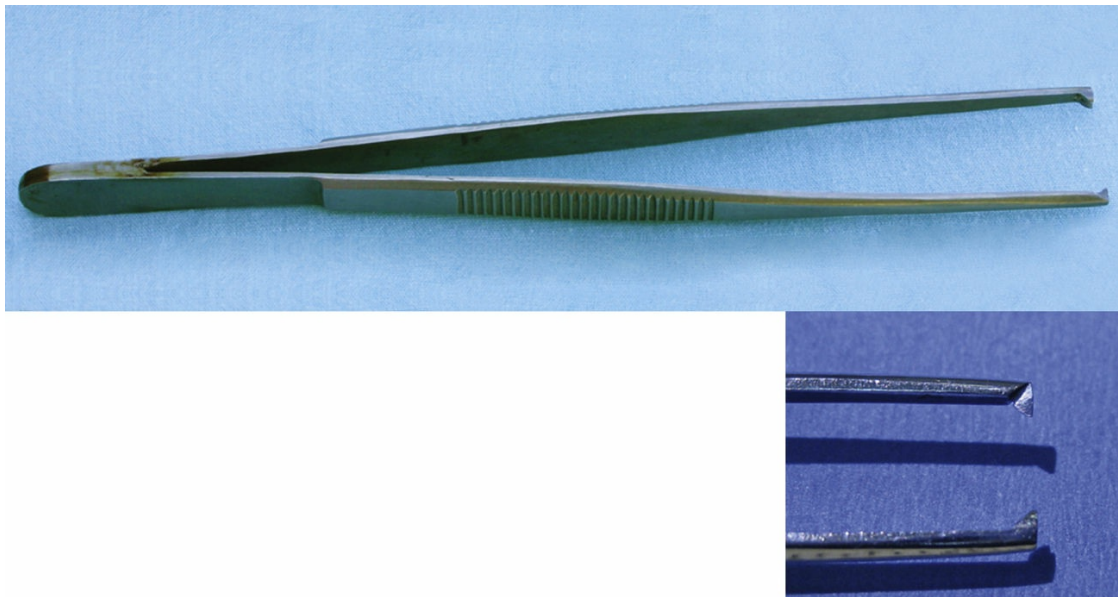
■ **Function**

To powerfully crush and create a fold in the tissues to which it is applied. It is often included in spay packs because it can be applied to uterine horns and spermatic cords.

■ **Characteristics**

One jaw has a raised ridge that runs down the center; the opposite jaw has a groove that accommodates the ridge when the instrument is closed. Both jaws have grooves that provide additional crushing power. The lengths of these forceps include 6½ and 7½ inches.

INSTRUMENT Tissue Forceps (Rat-Tooth Forceps)*



■ **Function**

To grasp skin and other dense tissues to place sutures. Forceps of this description can cause extensive damage to delicate tissues.

■ **Characteristics**

Two tines are connected at one end and are designed to remain open if pressure is not applied by fingers to close the tines. These tines have large teeth; one tooth fits in between two teeth on the opposite tine. The rat-tooth forceps can be ordered with serrated or fluted handles, and the lengths vary from 4½ to 12 inches. Teeth arrangements include 1 × 2, 2 × 3, 3 × 4, and 4 × 5 teeth. These forceps can also be ordered with extra-fine tips.

INSTRUMENT **Adson**

Tissue Forceps



■ **Function**

To pick up, hold, and maneuver delicate tissues.

■ **Characteristics**

The very fine teeth on each of the tines cause minimal trauma when a user is picking up and temporarily holding soft tissues. The usual length of the Adson forceps is $4\frac{3}{4}$ inches; it is available in 1×2 and 2×3 tooth arrangements, with either standard or delicate tines. It has a wide blade to allow thumb and finger pressure without fear of the tissues rotating out from between the fingers.

INSTRUMENT **Brown-Adson Tissue Forceps**



■ **Function**

To pick up, hold, and maneuver delicate tissues.

■ **Characteristics**

There are two rows of nine teeth on each tine that interlock when closed; each tine is $4\frac{3}{4}$ inches long with the same handle design as the Adson.

Forceps



• Function

To grasp inanimate objects such as dressings or nonviable tissues; this type of forceps causes significant damage to viable tissues.

■ Characteristics

The dressing forceps has transverse grooves that run across the tines. This type of forceps can be ordered with fine or fluted handles and can have extra narrow tips. Lengths vary from 4½ to 12 inches.

Tissue Forceps



■ Function

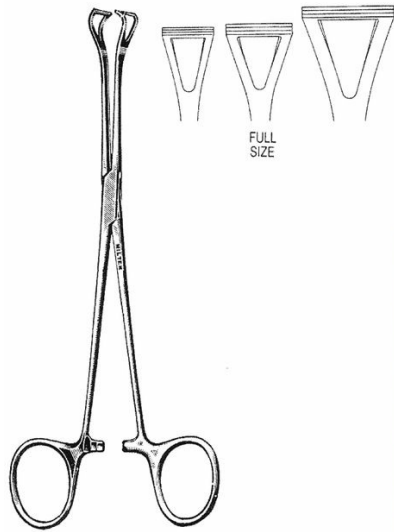
To hold with maximal power. However, it can cause tissue trauma in the process.

■ Characteristics

This forceps has a box lock and jaws with small teeth that are arranged so that the teeth are perpendicular to the pull. It is recommended that viscera not be grasped or held with this forceps because extensive damage can result. The length is 6 inches; teeth can be 3 × 4, 4 × 5, or 5 × 6 on each tip.

INSTRUMENT Babcock

Intestinal Forceps



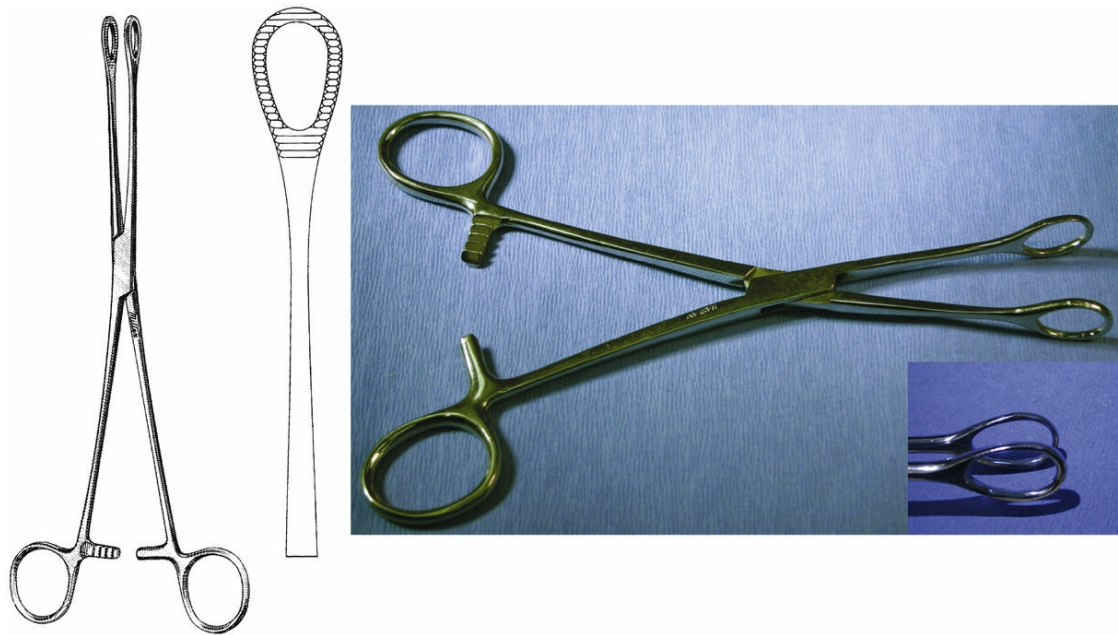
■ Function

To grasp or encircle delicate tissue, such as intestines or uterus, without crushing or traumatizing it.

■ Characteristics

Jaws curve out, and grooves run parallel where the jaws meet. This forceps has a lighter jaw compression, which allows atraumatic occlusion. Lengths range from 6¼ to 9½ inches.

INSTRUMENT Forester Sponge-Holding Forceps



■ Function

To apply the final paint of Betadine solution to a surgical site or to handle sterile dressings to provide hemostasis. Its length allows the user to reach far into a body cavity.

■ Characteristics

The oval jaws can be either smooth or serrated. The length is usually 7 inches, but it is also available in a 9½-inch length.

► Note

When using this forceps for hemostasis, it is important to avoid wiping or dragging the gauze across the vessel; doing so can pull the clot away from the vessel and can cause abrasions to the vessel and surrounding tissues.

Towel Forceps



• Function

To secure the drapes to a patient's skin by means of a small puncture. This forceps can also be used to grasp tough tissues and reduce small bone fractures.

■ Characteristics

Sharply pointed tips curve around and touch each other. They lock into place with a box lock. Lengths include 3½ (right) and 5½ (left) inches. A variation on the same instrument is the Roeder towel forceps, which has a metal bead on each tine. The beads prevent deep punctures to the skin and keep the drape from sliding toward the box lock.

Towel Forceps



• Function

To secure drapes to the patient's skin by means of a small puncture.

■ Characteristics

Sharply pointed tips curve around and touch each other. The forceps locks into place by means of pressure instead of a box lock and is available in 2½- and 3½-inch lengths.

* Tissue forceps vary in shape and are classified according to their uses. Most are used to grasp tissue or inanimate objects depending on the type of teeth or jaws they have and whether they have a ratchet or are held closed by the user.

CHAPTER 17

Instruments in Surgical Packs



This chapter covers instruments that are included in most traditional surgery packs but do not fit the criteria necessary to be defined as a hemostat or forceps. It also includes some miscellaneous instruments that may also be included in a surgical pack depending on the procedure being performed.

INSTRUMENT

Scalpel

Handles—#3, #4, and #8



#3



#4



#8

• Function

To incise and transect. These handles hold a variety of sizes of

surgical blades firmly in place while allowing the user to maneuver and maintain a comfortable grip. The #3 handle is used primarily for surgery in small animals; the #4 and #8 handles are used for surgery in large animals.

■ Characteristics

Handles #3 and #4 are spatula-like and have ribbed grip areas. The #8 handle is plastic and is contoured to fit the hand, making the user's grip on it more secure in cold temperatures. Each handle size has a blade seat of a different size.

► Caution

Never use your fingers to place or remove a blade from the handle. Grasp the noncutting edge of the blade with a hemostat or needle holder, and line the slant on the bottom of the blade with the slant on the handle. Then, slide the blade into the grooves on the tip of the handle until it clicks into the seat. To remove the blade with a hemostat or needle holder, grasp the bottom corner of the blade lift and slide it off the tip of the handle. Dispose of the blade into a sharps container.

INSTRUMENT Scalpel Blades—#10, #11, #12, #15, #20, #23



#10 #11 #12 #15
Fits onto a #3 scalpel handle

#20 #23
Fits onto a #4 or #8 scalpel handle

● **Function**

To make incisions, cut tissues, or debride dead tissue from wounds.

■ **Characteristics**

Each blade has its own shape and function.

#10—A general blade that is used for most procedures in small animals; fits a #3 handle.

#11—Used to puncture the skin, open an artery, and sever ligaments; fits a #3 handle.

#12—Used to lance an abscess; fits a #3 handle.

#15—Used for small, precise, or curved incisions; commonly used to declaw cats; fits a #3 handle.

#20 and #23—General blades used for most procedures in large animals; fits a #4 or #8 handle.

Director



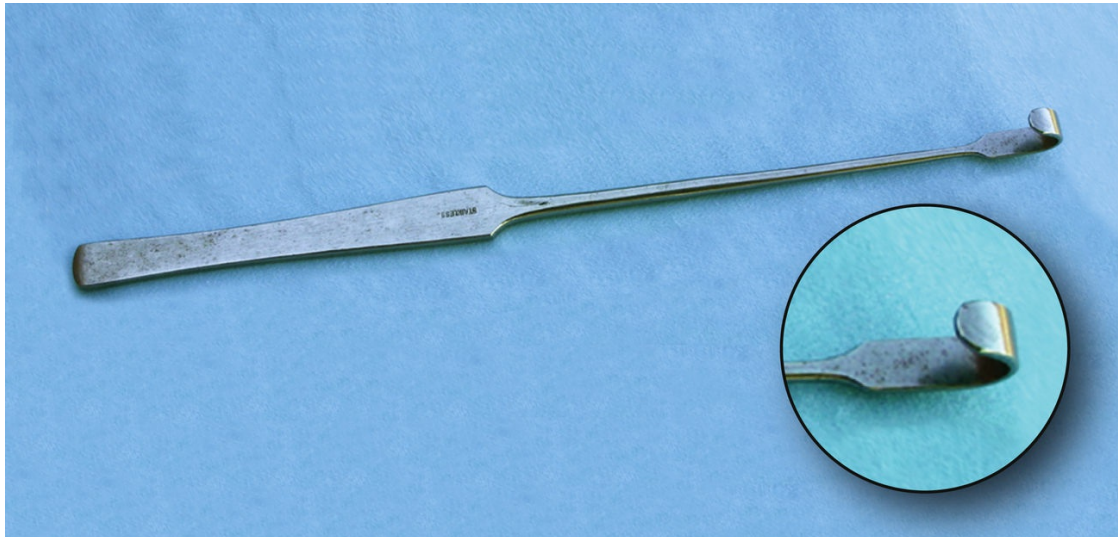
• Function

To shield underlying tissues while making an incision and to help make a straight incision line. A small stab incision is made through the skin and muscle layer using a scalpel blade. The groove director is introduced into the small incision and held parallel to the muscle layer. The trough is used to guide the scalpel as it makes the incision.

■ Characteristics

A heart-shaped handle lies at one end of an open, trough-like, tapered tube that extends along its length.

INSTRUMENT Snook's Ovariectomy Hook



■ **Function**

To retrieve the uterine horn from within a small animal. This instrument allows the surgeon to make an incision smaller than one that is big enough for a finger to fit into.

◆ **Common Name**

Snook hook

■ **Characteristics**

This instrument is 8 inches long and has a flat, rounded hook at the end.

INSTRUMENT Half-Circle Taper-Point Suture Needle (Ferguson)*



• **Function**

To suture organs and vessels.

■ **Characteristics**

This needle is round from point to eye. The rationale is to select suture material the same size in diameter as the needle. When the needle is pushed through the tissue, the suture material fills the resulting hole. This reduces trauma to the tissue and helps to prevent leakage if the organ or vessel happens to have a lumen. These needles are available in ½- and 3/8-inch diameters. Sizes start at 2, the largest, and decrease by increments of 2; 20 is the smallest. They can also vary in diameter; intestinal needles are fine, while regular surgeons' needles are quite thick.

INSTRUMENT Half-Circle Cutting-Edge Suture Needle



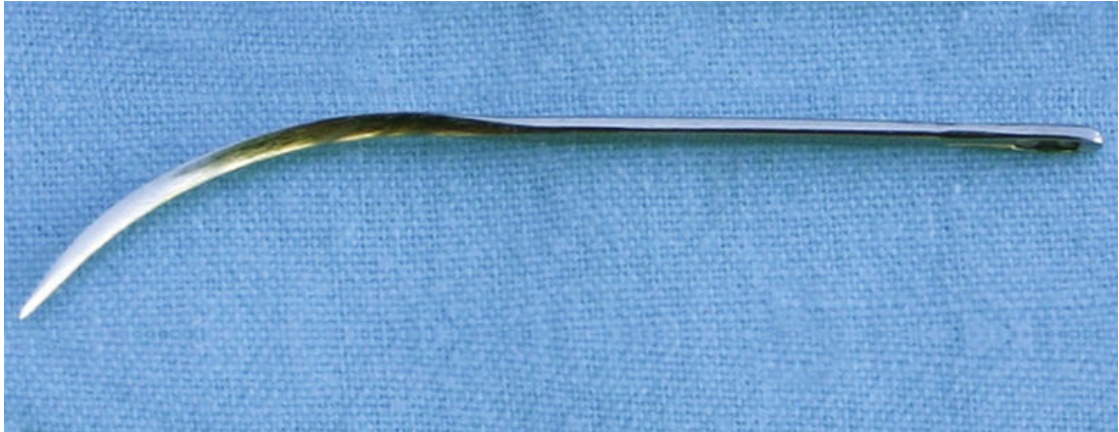
■ **Function**

To suture skin, tendons, and ligaments.

■ **Characteristics**

This needle is triangular and has cutting edges on all three sides or has a flat cutting surface at the tip that gradually forms a triangle as it gets closer to the eye. The needle actually slices a flat line into the tissue as it is passed. This can weaken soft tissue like muscle, and it allows serum to accumulate on both sides of the tissue. These needles are available in ½- and 3⁄8-inch diameters. Sizes start at 2, the largest, and decrease by increments of 2; 20 is the smallest. There are also cutting-edge suture needles for large animals that are measured in inches, starting at 3 inches and progressing to 6 inches in length.

INSTRUMENT Half-Curved Cutting-Edge Suture Needle



• **Function**

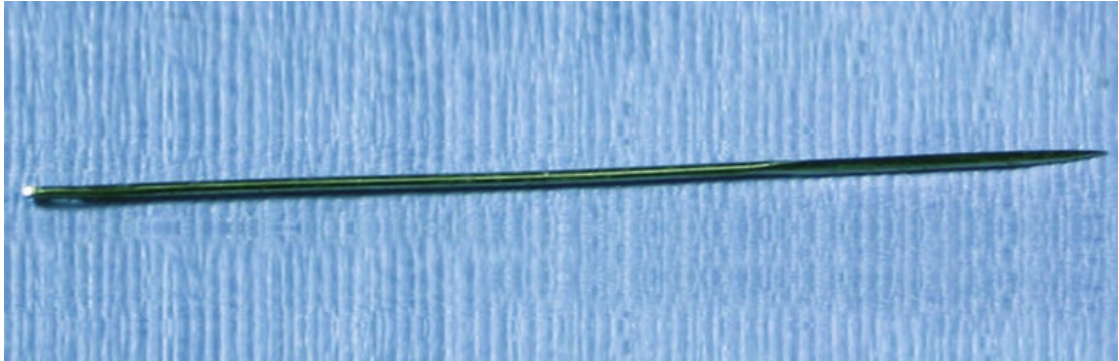
To suture skin, tendons, and ligaments.

■ **Characteristics**

This needle has a straight shaft that ends in a half curve.

INSTRUMENT Keith's

Abdominal Suture Needle



■ **Function**

Cutting-edge needle used to suture skin, tendons, and ligaments.

■ **Characteristics**

This needle is straight.

INSTRUMENT

Postmortem Needle



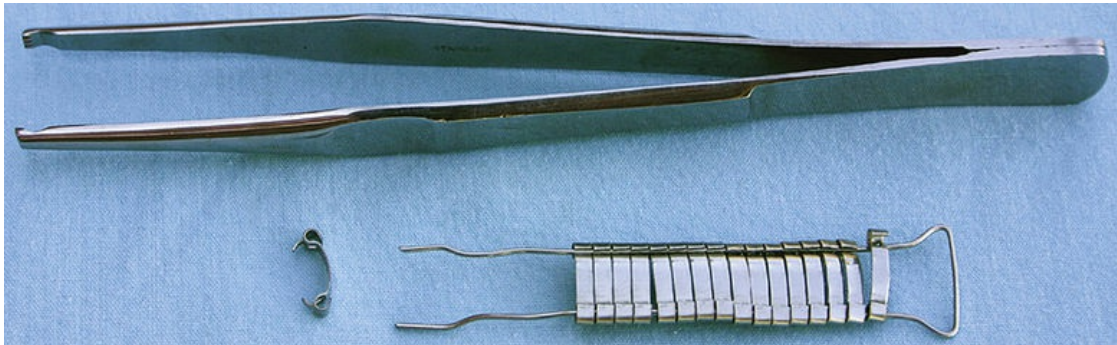
• Function

Used to suture skin on animals that have had a necropsy. Some veterinarians like to use it to suture large-animal skin after abdominal surgery.

■ Characteristics

This large needle has a cutting edge and is curved to allow the veterinarian to grasp it just down from the eye and hold it while pushing it through the skin. Large suture material can be used, which can speed up closure of a necropsied animal or a lengthy incision on a large-animal patient.

INSTRUMENT Michel Wound Clip and Applying Forceps



• **Function**

To apply or remove a Michel wound clip.

■ **Characteristics**

This instrument has two designs. One looks very much like a thumb forceps, except that the tips are cupped to hold the clips. The other has handles with a removing device at one end and the applying cups at the ends of the handles. These are used in closing wounds and are often used for entropion in sheep.

Wound Clips



• Function

To hold wounds together or to roll out eyelids in cases of entropia.

■ Characteristics

Small metal clips with sharp prongs are folded over incision sites to hold the edges together.

Dermal Punch



● **Function**

To obtain a dermal biopsy.

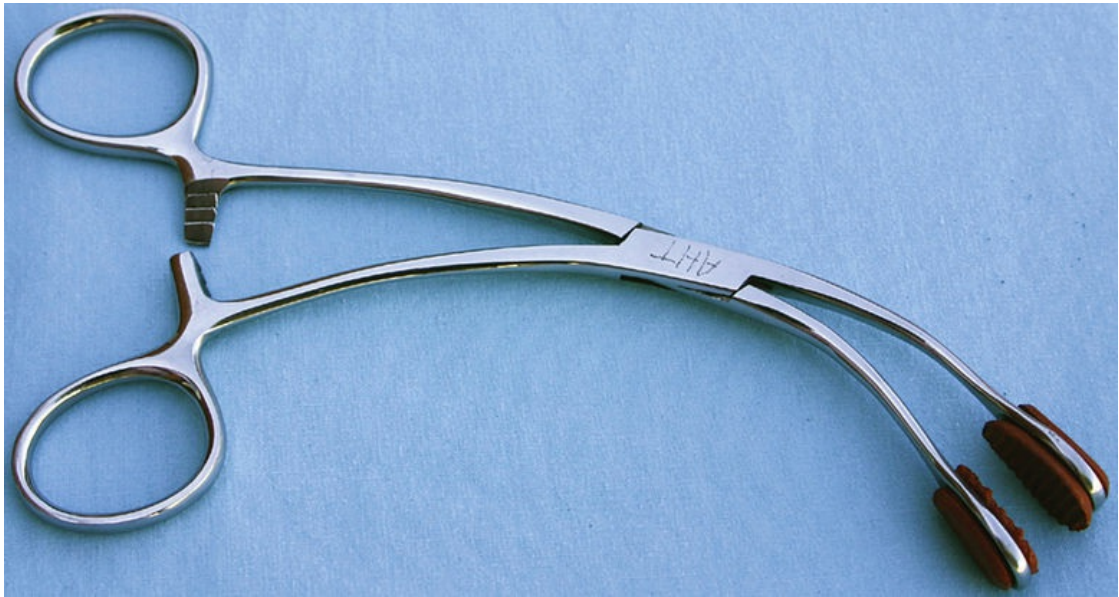
◆ **Common Name**

Dermal punch, punch

■ **Characteristics**

Sharp edges have a variety of diameters, including 2, 3, 4, 6, and 8 mm.

INSTRUMENT Young Tongue-Seizing Forceps



■ **Function**

To grasp and hold the tongue atraumatically.

■ **Characteristics**

Soft rubber inserts on the jaws of this forceps protect the tongue as the instrument's jaws are closed. The instrument is usually curved and is approximately 7 inches long. The rubber inserts get hard over time but can be replaced with new ones by simply popping out the old inserts and popping in the new ones.

INSTRUMENT

Presbyterian Hospital Occluding Forceps



• Function

To clamp rubber tubing without cutting through it.

■ Characteristics

The jaws on this forceps are smooth.

INSTRUMENT Alligator Forceps



■ Function

To reach deep into an animal's body to retrieve a foreign object.

■ Characteristics

This distinctive instrument has a long narrow shaft that ends in tiny grasping jaws. The jaws are opened and closed by handles that resemble a forceps. The jaws may be serrated or cross-hatched or may have 1 × 2 teeth on the very tips. The shafts may be 3½, 5½, 8, or 12 inches long.

* Suture needles are used to introduce suture material into tissues. They come in a variety of sizes, shapes, and thicknesses; the particular needle chosen is determined by the type of tissue to be sutured and type of suture material to be used.

CHAPTER 18

Needle Holders and Scissors



INSTRUMENT Mayo- Hegar Needle Holder



■ Function

To drive suture needles through tissue that requires suturing and to assist in tying sutures.

◆ Common Name

Needle holder

■ Characteristics

Short jaws have grooves that are cross-hatched on the surface, and some models have a longitudinal groove down the centers of the jaws. The cross-hatching provides superior holding power so the

needle does not turn in the jaws. The needle holder has a box lock and may have carbide inserts in the jaws. The inserts can be replaced if the jaws lose their gripping power, thus extending the life of the needle holder. Needle holders with carbide jaws have gold handles. Lengths include 5¼, 6, 7, 8, 10½, and 12 inches. The size of the needle holder is determined by the size of the needle used. A needle that is too large for a particular needle holder can damage the jaws and the box lock.

INSTRUMENT Olson-Hegar Needle Holder–Scissors Combination



● **Function**

To drive suture needles through tissue that requires suturing and to assist in tying sutures.

◆ **Common Name**

Needle holder

■ **Characteristics**

Scissor blades are set behind the jaws. After the suture is tied into a knot, the surgeon can cut the suture material with the same instrument. This can speed up the time it takes to suture, but a false

move can mean disaster, for it is possible that the surgeon might cut the suture material in the wrong place or inadvertently cut tissue. The lengths of this instrument may be 5½, 6½, or 7½ inches. They are also available with carbide jaws.

INSTRUMENT

Metzenbaum Scissors



• Function

To blunt-dissect or cut soft tissues.

■ Characteristics

The fine blades on this scissors are approximately 1½ inches long and have blunt or pointed tips. Their lengths can be 4½, 5¾, or 7 to 11 inches, but the most common length is 7 inches. The blades can be straight or curved as well as smooth or serrated. This scissors should never be used to cut suture material or bandaging material because doing so dulls the blades. (Blunt dissection involves introducing the closed blades into an area; the blades are then opened and pulled backward through the tissues.) Blunt dissection

stretches the small capillaries so they do not bleed, preventing the accidental cutting of tendons, ligaments, and large blood vessels.

INSTRUMENT

Mayo

Scissors



Straight

Curved

■ **Function**

To perform blunt dissection and to cut through bulky connective tissues.

■ **Characteristics**

This scissors has more mass than the Metzenbaum scissors and is commonly used in large animals. Lengths range from 5½ to 6¾ inches. Blades may be straight or curved, smooth, or serrated.

INSTRUMENT Operating Scissors—Blunt-Blunt, Sharp-Blunt, Sharp-Sharp



■ **Function**

To cut suture material or other inanimate materials.

■ **Characteristics**

Operating scissors are available in lengths of 4½, 5, 5½, and 6½ inches; the last is the most common length. The tips of the blades are available in three combinations: the blunt-blunt scissors has blades that are rounded, the sharp-blunt scissors has one rounded and one pointed blade, and the sharp-sharp scissors has two blades that are pointed. The most common of the three is the sharp-blunt.

► **Note**

The tips are used to cut the suture material, so they become dull rather quickly. If the scissors is to be sharpened, remind the sharpener to pay attention to the tips and to be careful not to grind them so much that they do not contact each other when the scissors is closed.

Scissors



■ Function

To cut stainless steel wire, which is commonly used in orthopedic surgery.

■ Characteristics

This scissors has short, compact, serrated blades. The serrations hold the wire in place, giving the scissors the ability to exert added pressure to cut heavier gauge wire without slipping or crimping the wire. The blades may be angled or straight, and the length is usually 4¾ inches.

INSTRUMENT Straight Spencer Delicate-Stitch Scissors



■ **Function**

To remove sutures from an incision line or wound closure in small animals.

◆ **Common Name**

Stitch scissors

■ **Characteristics**

The tip of one blade of this scissors has a small depression that can be slipped between the suture material and the skin. The depression is just as sharp as the rest of the scissors and can cut the suture material with ease. These scissors are 3½ inches in length.

INSTRUMENT Straight Littauer Stitch Scissors



■ **Function**

To remove sutures from an incision line or wound closure in large animals.

◆ **Common Name**

Stitch scissors

■ **Characteristics**

This scissors is designed exactly like the Spencer delicate-stitch scissors, but it is larger at 4½ inches in length. The size sometimes makes it difficult to use when removing sutures from small

animals, but it can be used in a pinch.

INSTRUMENT **Lister**

Bandage Scissors



■ **Function**

To remove bandages and other dressings.

■ **Characteristics**

One blade ends in a blunt triangle that is designed to push the skin out of the way as the tine is slipped under the bandage material, preventing accidental cutting of the skin by the scissors. The scissors are angled to allow users to get their fingers under the scissors and still be able to open and close it without being obstructed by the animal's body. The lengths range from 3½ to 8 inches.

Bandage Scissors



■ Function

To remove bandages and other dressings.

■ Characteristics

The finer blades and straight or curved tines mean that the user can place them beneath tightly fitting bandages. Lengths range from 3½ to 8 inches.

INSTRUMENT

Economy/Utility Bandage Scissors



• Function

To remove bandages and other dressings.

■ Characteristics

A scissors is useful for removing large, bulky bandages, such as a Robert Jones bandage on a small animal or any bandage on a large animal. This scissors can also be used to cut tubing and thick bandaging materials.

CHAPTER 19

Retractors and Rib Spreaders



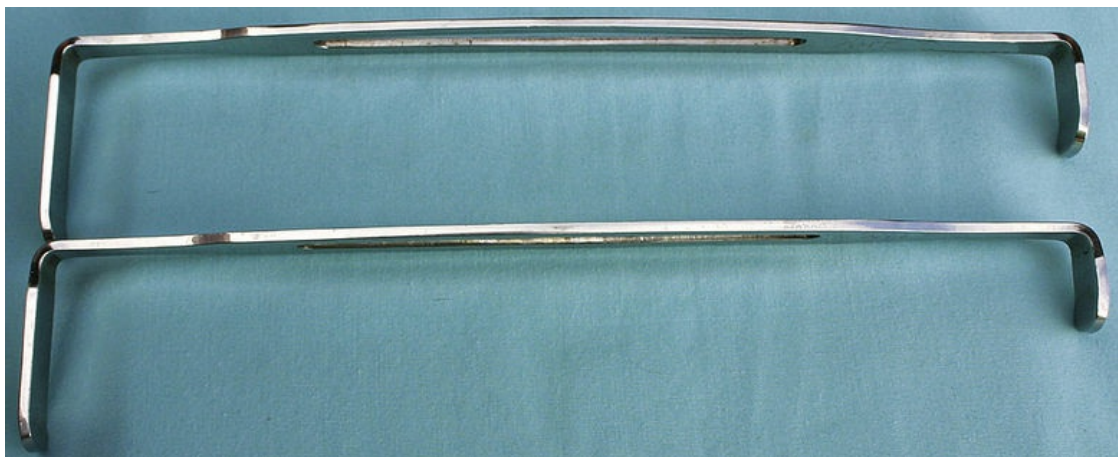
Retractors are instruments that are used to hold open a wound, incision, or organs so that the surgeon can view underlying tissues. Retractors are either handheld or self-retaining. Rib spreaders hold the ribs apart, allowing access to the thoracic cavity.

Hand-Held Retractors

INSTRUMENT

US Army–

Pattern Retractor



● **Function**

To hold open a wound or incision so that the surgeon can view underlying tissues.

◆ **Common Name**

Army retractor

■ **Characteristics**

This retractor comes in a set of two. It is a double-ended retractor with a lateral curve of the blades on each end. One end is a curved paddle about 5/8 inch wide and is placed over the wound edges to ease the wound open gently. The other end is angled and has longer ends to facilitate a good grip with the fingers or to go deeper into a wound cavity. The length of the retractor is 8½ inches.

Rake Retractor



• Function

To hold open a wound or incision so that the surgeon can view the underlying tissues.

◆ Common Name

Senns

■ Characteristics

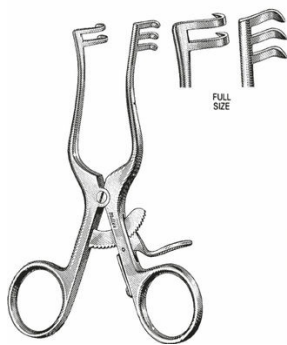
This retractor is about 6¼ inches long and ends in three-pronged sharp or blunt points that curve sharply. It works well with smaller incisions and wounds than the US Army-pattern retractor. Small handles allow only one or two fingers to hold the instrument.

Self-Retaining Retractors

INSTRUMENT

Weitlaner

Retractor



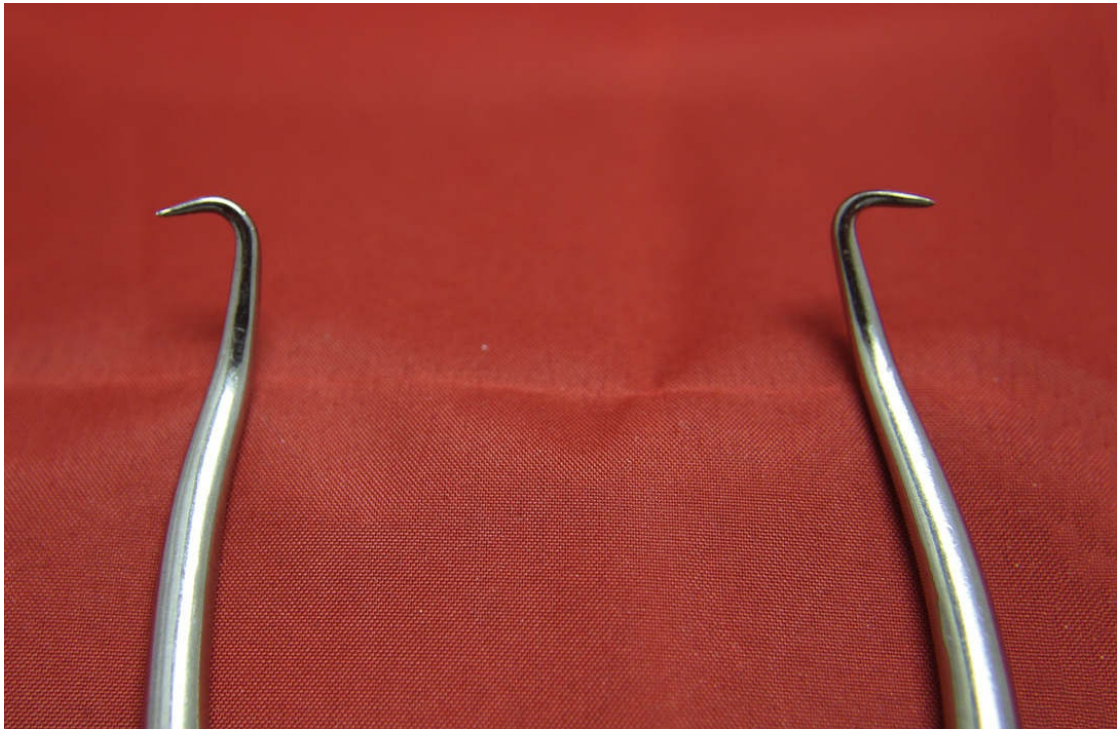
● Function

To maintain muscle retraction during orthopedic surgery.

■ Characteristics

Sharp or blunt, outward-curved prongs are held open by a ratchet just above the handle. The prongs come in a 3 × 4 configuration. Lengths are 4, 5½, 6½, 8, and 9½ inches. The 4-inch retractor is referred to as a “baby Weitlaner”; its prongs are 2 × 3.

Retractor



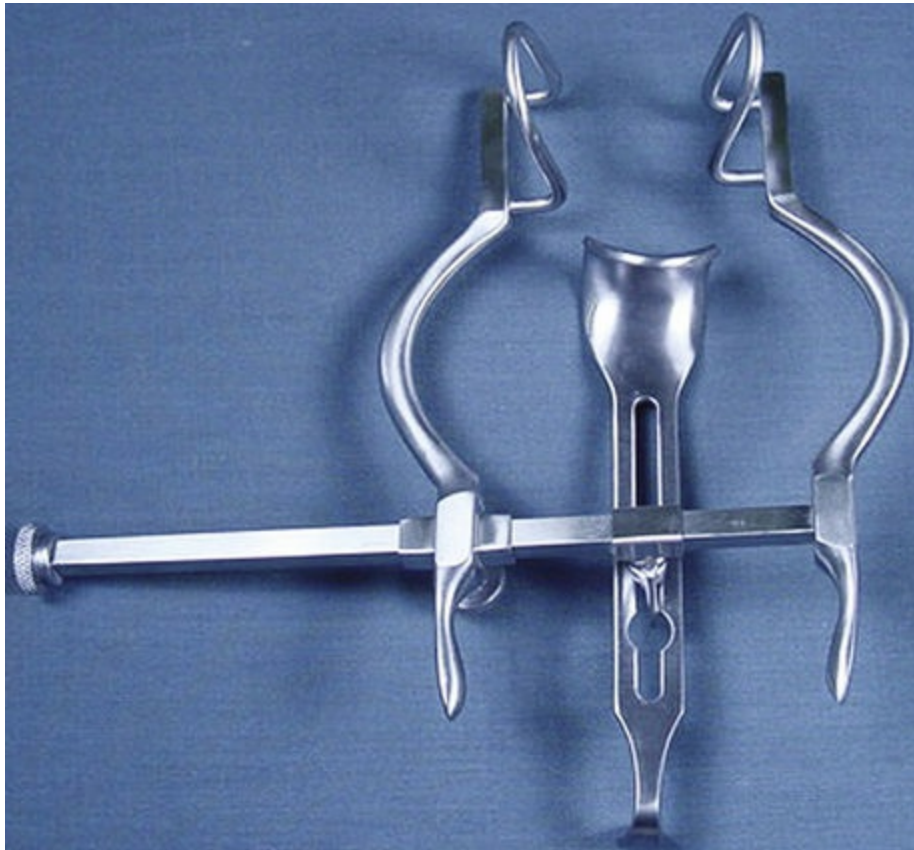
• Function

To maintain wound exposure during general surgery, orthopedic surgery, and neurosurgery.

■ Characteristics

Sharp, outward-curved points are arranged on a gently curved shaft that opens wider than the Weitlaner retractor. The length is usually 7 inches, although a “pedifine” Gelpi can be 3½, 4½, or 5½ inches long. It can also be purchased with stops on the points so that tissue does not slide along the shafts.

INSTRUMENT Balfour Retractor



● **Function**

To hold the abdominal wall open for the performance of surgical procedures.

■ **Characteristics**

Two wire-like blades are inserted into the incision line and spread apart. The scoop-like blade is positioned on the sternum or on the cranial aspect of the incision. All three blades can be adjusted to provide maximum exposure of the abdomen. The blades and the

overall length of the Balfour retractor vary; there can be five different configurations to set this instrument to for various surgical incisions.

Rib Spreaders

INSTRUMENT

Frazier Rib Spreaders



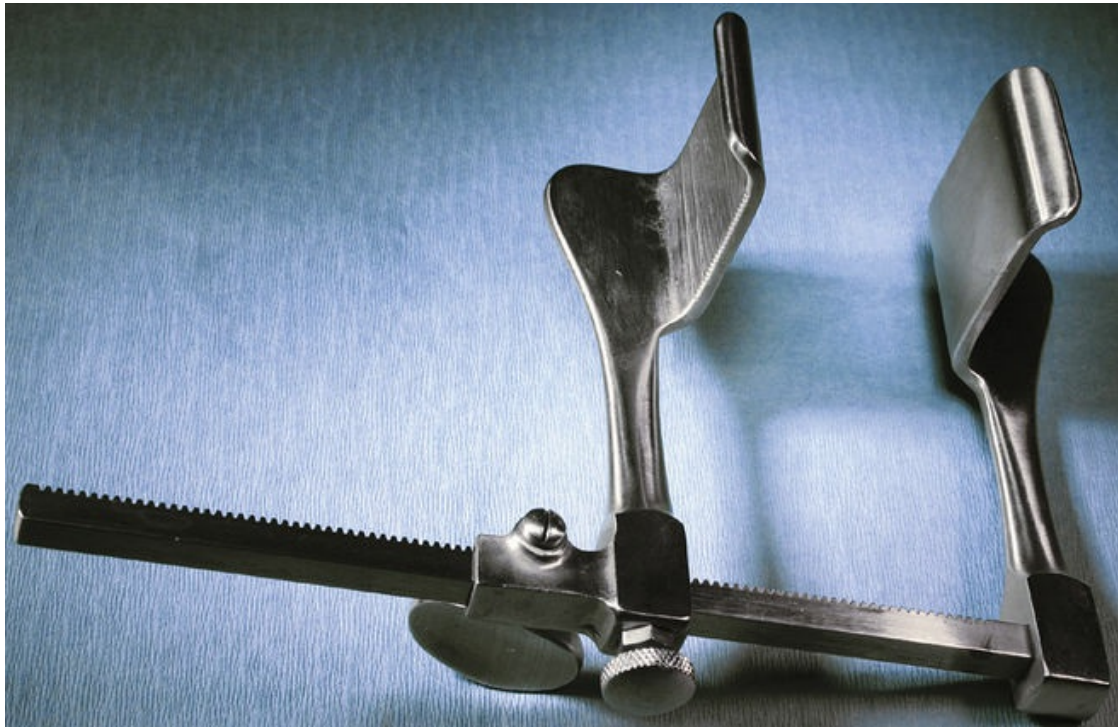
● **Function**

To hold the ribs apart during thoracic surgery.

■ **Characteristics**

Half-curved, blunt prongs are positioned on the ribs and then pulled away from each other. The prongs are held in place by a turn screw. They are 3 × 4 and can be spread to 4 inches.

INSTRUMENT Tuffier Rib Spreader



■ **Function**

To hold the ribs apart during thoracic surgery.

■ **Characteristics**

This rib spreader has solid square scoops that are positioned on short shafts. To spread the scoops apart, the user turns a dial that is attached to one of the shafts. The spreader is maintained in position by tightening of the locking mechanism.

INSTRUMENT

Finochietto Rib Spreaders



■ Function

To hold the ribs apart during thoracic surgery.

■ Characteristics

A heavy-duty rib spreader, the Finochietto has wide, square scoops that are positioned on long, thick shafts. To spread the scoops apart, the user turns a handle that is attached to one of the shafts. The spreader stays in position without a locking mechanism.

CHAPTER 20

Orthopedic Instruments



This chapter covers the standard instruments found in general orthopedic work. It is by no means a comprehensive list of instruments that an orthopedic surgeon may have available.

INSTRUMENT Periosteal Elevator



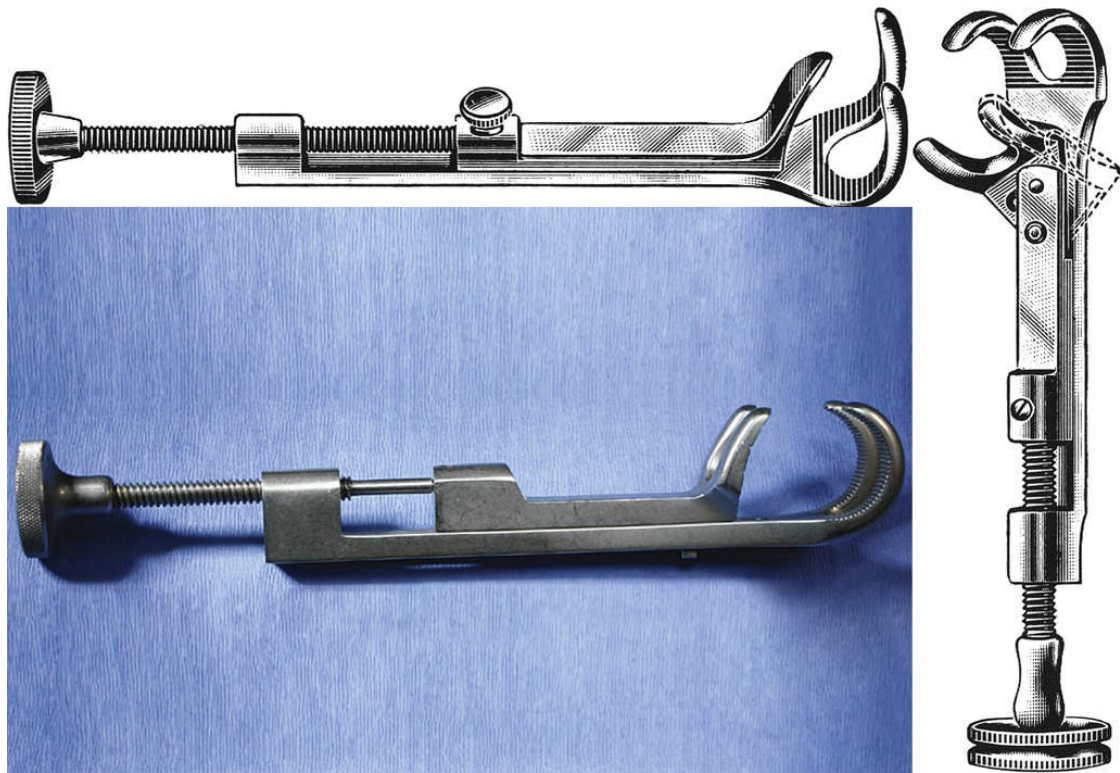
• **Function**

To work under and lift the periosteum or soft tissues away from the bone.

■ **Characteristics**

A curved bladelike end has a handle. It may be 6½ to 10 inches long and may have a blunt or a sharp blade that is scooped or curved. There may be a blade on each end of the handle.

INSTRUMENT Lambert-Lowman Bone Clamp



■ **Function**

To hold bone and bone fragments together for fixation with pins, screws, or plates. The clamp does so without causing further trauma to the periosteum.

■ **Characteristics**

Curved jaws sit at the top of a square handle with a knob at the bottom, which is used to bring the jaws together. The jaw configuration can be 1×1 , 2×1 , or 2×2 . The instrument's length ranges between $4\frac{1}{2}$ and 8 inches, and jaw lengths range from $\frac{3}{4}$ to $1\frac{1}{2}$ inches. Some models allow the lower jaw to tilt.

Bone-Holding Forceps



■ Function

To hold bone and bone fragments together for fixation with pins, screws, or plates. Care must be taken to avoid clamping this instrument too tightly because doing so can cause bruising to the bone.

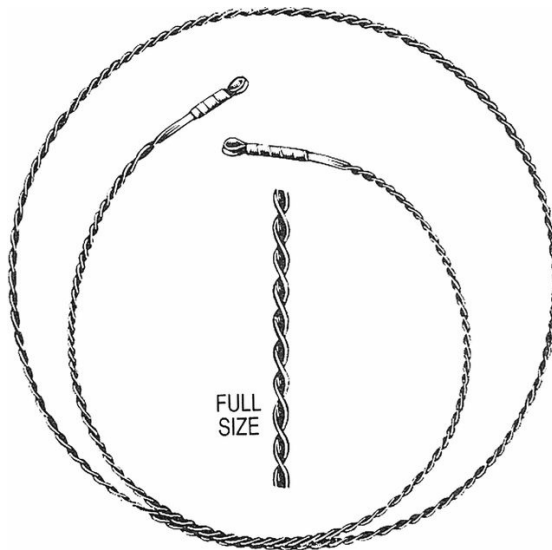
■ Characteristics

The jaws are not as curved as those of the Lambert-Lowman clamp. They are held closed by a ratchet located at the bottom of the handles. Lengths range from 5¾ to 8½ inches, with or without the ratchet. The Lane looks very much like the Kern except that it has a greater jaw width and the length ranges from 13 to 17 inches.

INSTRUMENT

Gigli Wire

Saw and Handles



■ Function

To cut through thick or heavy bone.

■ Characteristics

A rough wire is attached to or can be attached to handles. The wire is placed around a bone or horn, and a back-and-forth motion cuts through the matter with minimal effort.

INSTRUMENT Liston **Bone-Cutting Forceps**



■ **Function**

To cut bones.

■ **Characteristics**

This heavy-jawed instrument has smooth scissor-like jaws used to break ribs or other small bones. It is 5½ to 8 inches long and has straight or angled jaws. It is available with a double-action handle that increases the power of the instrument. A larger version of this instrument, called the Stille-Liston forceps, is available in a 13-inch length, and the double-action handle is a standard feature.

Rongeur



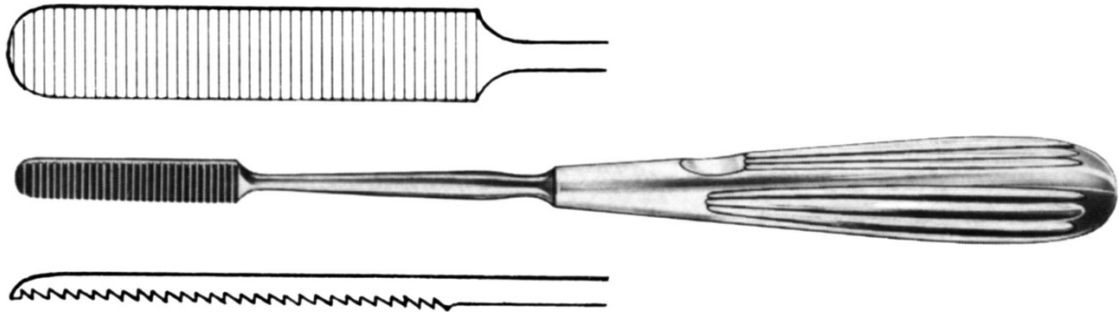
• Function

To remove or break up small chunks of bone, cartilage, or fibrous tissue.

■ Characteristics

Small cups with sharp edges form the jaws of this instrument. It has double-action handles, giving it greater power when it is squeezed. It is 6 to 7¼ inches long and has jaw dimensions that range from 4 × 15- to 6 × 15-mm bites. The jaws can be angled or straight. They are also available with plain handles, which are commonly used on the smallest of bones and are called Adson, Luer, or Lempert rongeurs.

Rasp



• Function

To smooth off rough edges of bones.

■ Characteristics

Raised cross-hatches on the surface of this instrument look much like those on a file found on a carpenter's workbench. However, the end may be pointed, blunt, or rounded and may be flat or convex. Lengths range from 8½ to 11 inches. The instrument is also called a Putti or a Fomon rasp.

INSTRUMENT

Osteotome



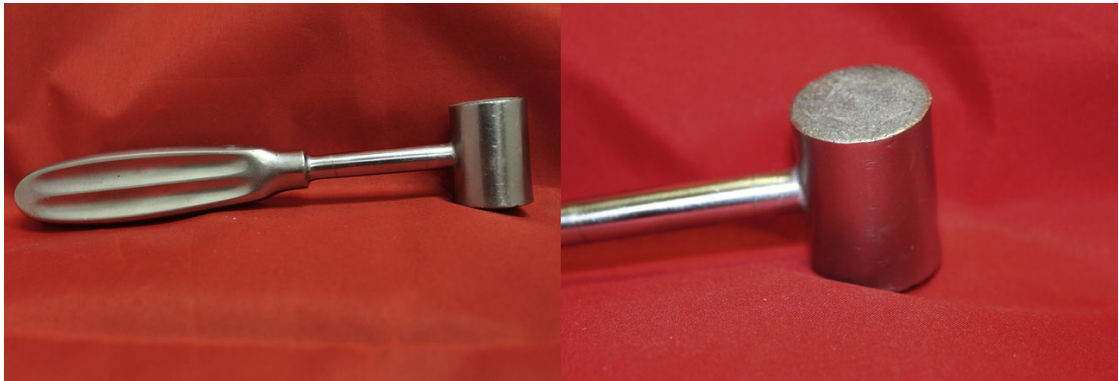
• Function

To cut through or to shape bone.

■ Characteristics

A tapered blade is situated at one end of a handle; the other end flares to accept the blow of a mallet. Osteotomes are 6½ to 9 inches long and vary in width from 6 to 38 mm. If the blade is curved, the instrument is called a gouge.

Mallets



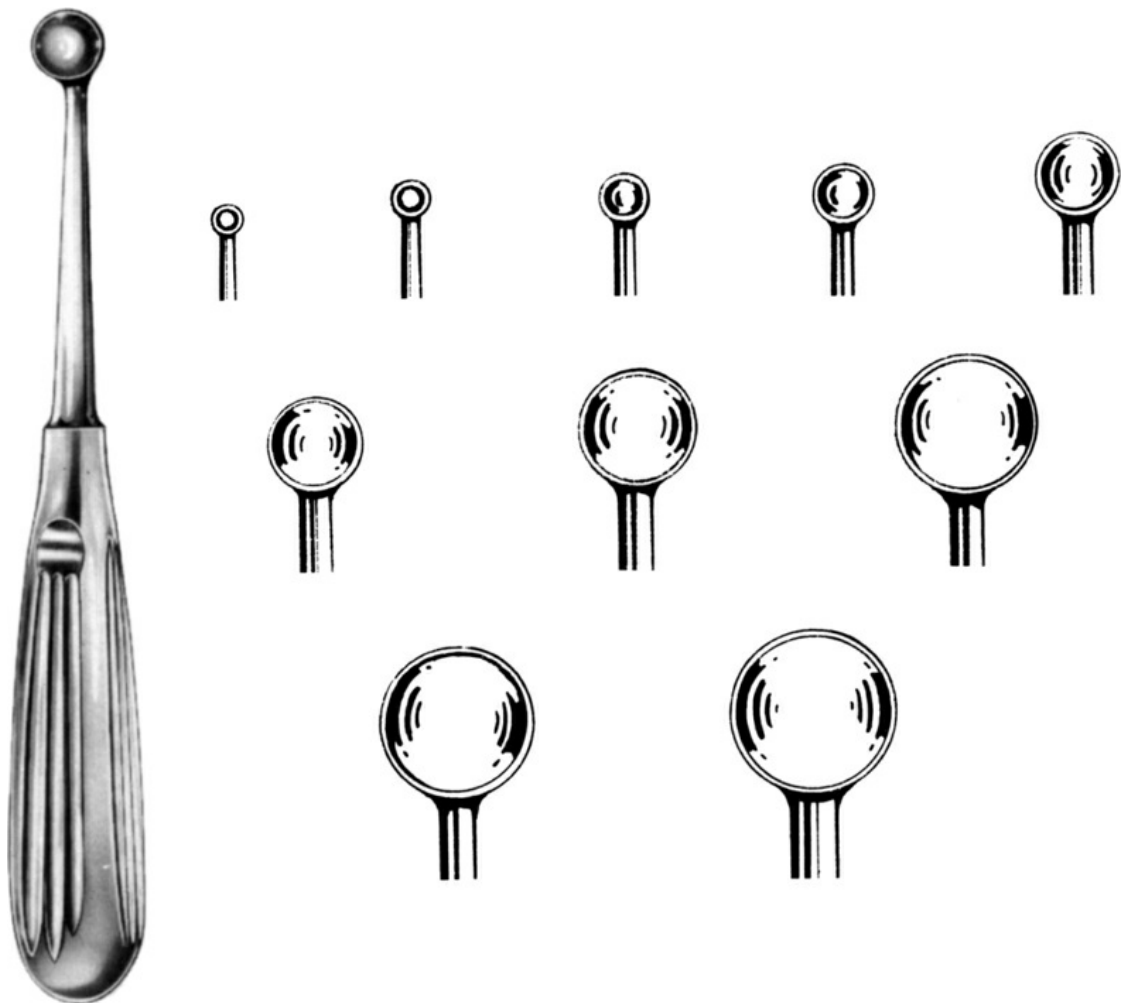
• Function

To set pins or to strike osteotomes or any other matter that requires pounding during surgery.

■ Characteristics

The heads of these mallets are filled with lead, making them heavy for their sizes. Lengths vary from 7½ to 8½ inches. They are known as Gerzog, Mead, and Lucae mallets and as the Richards combination mallet, which has a plastic-covered head on one side.

Curette



■ Function

To scrape out cancellous bone from the medullary cavity to perform bone grafts or to scrape osteochondrosis dissecans (OCD) lesions.

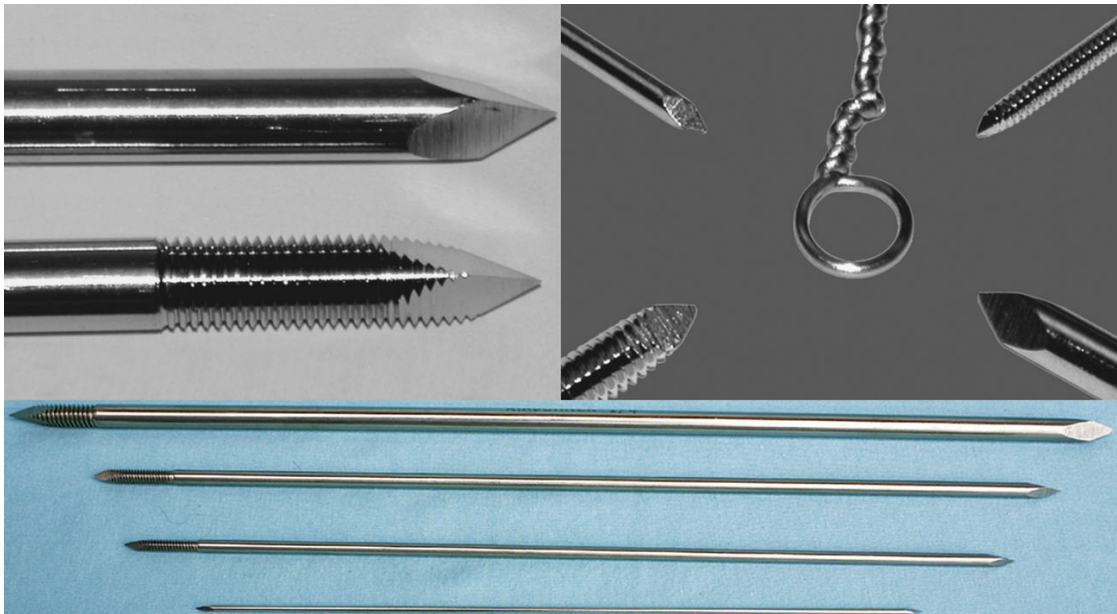
■ Characteristics

One end is a cup with sharp edges; the other end is a wide handle.

The cups may be oval or round. Lengths vary from 6½ to 8 inches. Cup sizes are indicated in two ways: in (ott) or O sizes as in suture material sizing or in millimeters. The Brun curette has one cup, while the Volkmann curette has one cup on each end.

INSTRUMENT

Intramedullary Pins



• Function

To facilitate fracture stabilization by placing a stainless steel rod in the medullary cavity.

■ Characteristics

A stainless steel rod has a sharp triangular point at one or at both ends. The ends can be smooth or can be threaded on one or both ends. The ends are available in three different tips. A chisel (diamond) tip facilitates sliding the pin along the medullary cavity. A trocar point is considered a cutting tip, and the threaded trocar tip provides a solid anchor in the bone. A Steinmann pin has a trocar point on one end and is squared off on the other end. Pins come in lengths of 7 to 12 inches long and 1/16 to 1/4 inches in diameter. The Kirschner wire/nail (K-wire) is also 7 to 12 inches long, but the diameters range from 0.035 to 0.625 mm.

INSTRUMENT

Intramedullary Pin Chuck



■ Function

To place intramedullary pins into the bone.

■ Characteristics

This instrument has a chuck on one end that is the same as that found on an electric drill. It tightens down around the pin with the use of a key. It may have a solid handle or a hollow handle that allows the end of the pin to protrude. The latter type should have a detachable extension tube that covers the excess and protects surgeons from accidental injury or contamination by puncturing themselves or a glove with the pin tip.

INSTRUMENT

Intramedullary Pin Setter



• Function

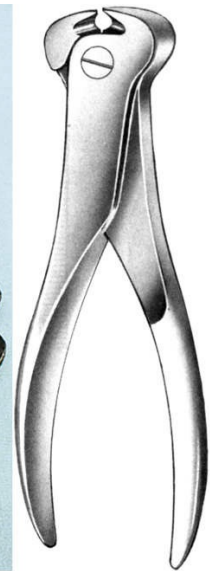
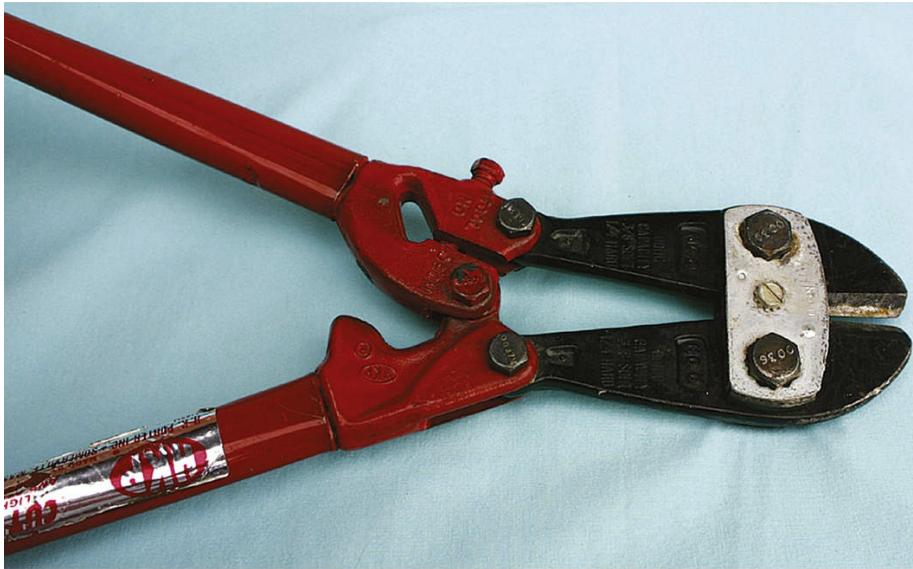
To set an intramedullary pin into the medullary cavity.

■ Characteristics

Looking much like a punch, this instrument has an indented end that fits over the intramedullary pin; the other end has a handle that can withstand a blow by the bone mallet.

INSTRUMENT

Intramedullary Pin Cutter



Pin cutter

● Function

To cut pins to the proper length.

■ Characteristics

Many models look much like bolt cutters. Thick jaws with spring action make cutting a stainless steel pin easy work.

INSTRUMENT

Orthopedic Wire



● Function

To repair fractures in combination with pins, plates, or external fixation apparatus.

■ Characteristics

Stainless steel wire in 18-, 20-, and 22-gauge diameters is applied in the cerclage manner, which is similar to that of a twist tie.

Twister



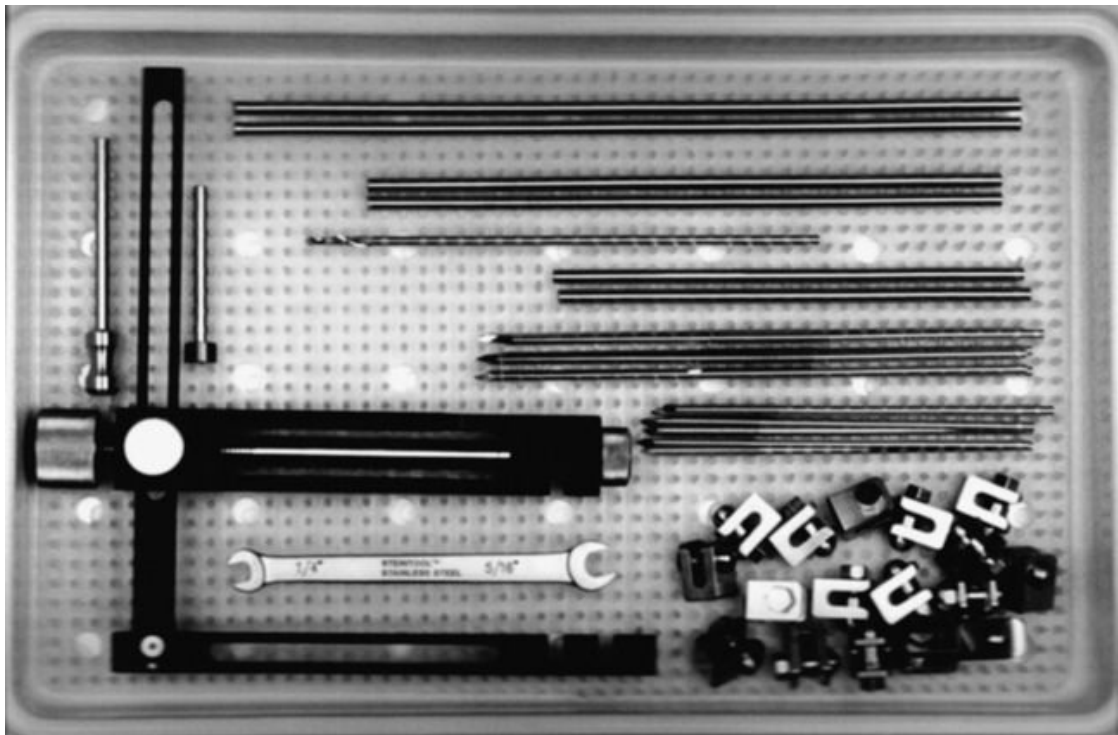
■ Function

To twist orthopedic wire to secure bone fragments.

■ Characteristics

A circular end has two holes for the insertion of the wire. Once the wire has been placed around the bone, the handle of the twister is turned, twisting the wire down in an orderly manner.

INSTRUMENT External Fixation Kits



■ Function

To repair fractures by inserting pins into the bone from the outside.

■ Characteristics

A series of pins are inserted through the skin and into the bone. The pins are then connected to a connector rod, bringing the fracture into alignment.

INSTRUMENT **Bone**

Plates and Screws



Bone plate



Bone screw

• **Function**

To repair a fracture by applying a stainless steel plate with stainless steel screws, or just stainless steel screws.

■ **Characteristics**

Stainless steel plates and screws come in a wide variety of sizes and styles. Most clinics have a number of them on hand.

INSTRUMENT Bone-Plate Bender



Bone bending irons



Bone bending pliers

• **Function**

To bend plates to fit the contours of the bone being repaired.

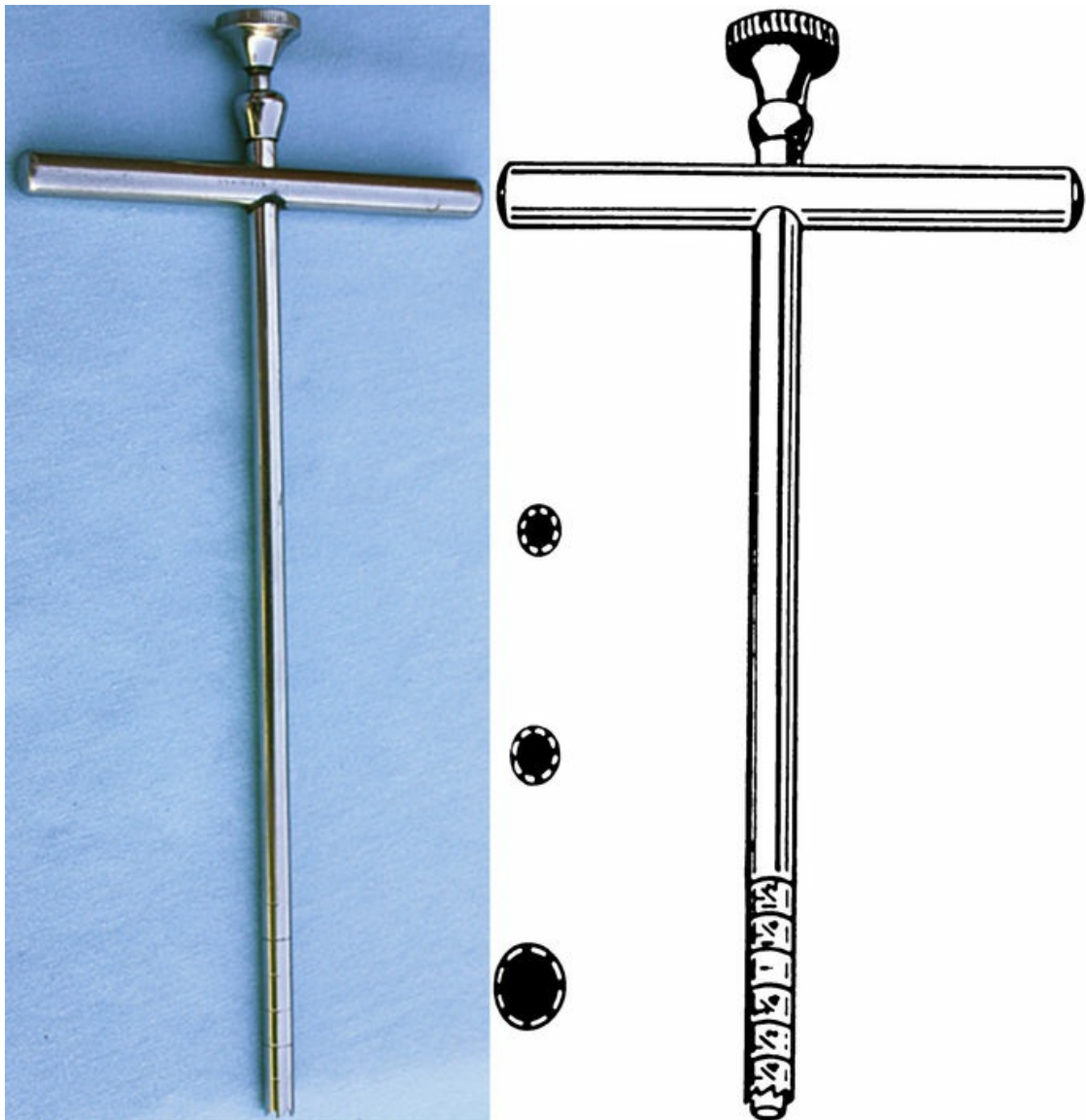
■ Characteristics

One type is a straight, flat metal instrument with one or two grooves designed to cradle the plate while the surgeon applies pressure. The other type grips the plate between rollers and is bent when the surgeon closes the handles. The first type works well with small, narrow plates; the second type works with plates 3.5 mm and larger.

INSTRUMENT

Michel

Laminectomy Trephine



• Function

To perform bone biopsies or to drill small holes into the skull or sinus.

■ Characteristics

One end has small cutting blades that drill into the bone. The shaft has graduations for depth control, and there is a handle at the other end. The instrument is hollow and has a stylet to facilitate the capture of a biopsy. It is usually 7½ inches long.

INSTRUMENT **Thomas-Schroeder Splint**



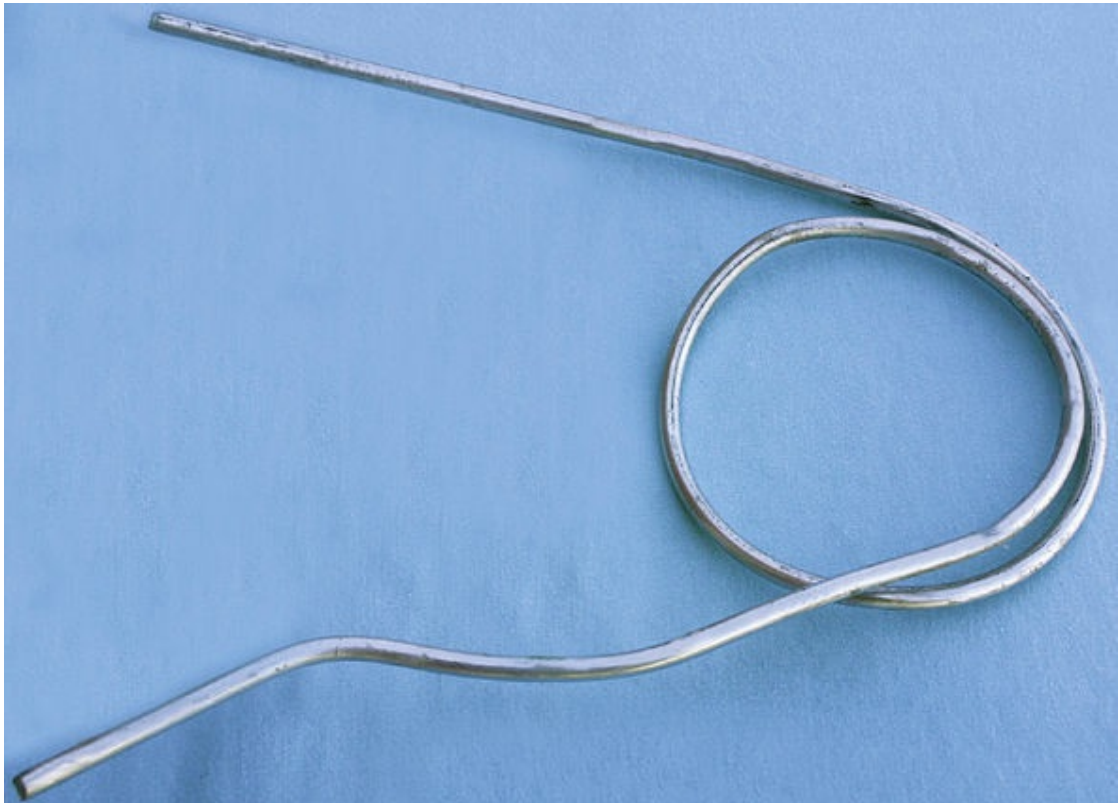
■ **Function**

To stabilize simple fractures of the lower leg bones, the tibia and fibula, and the radius and ulna.

■ **Characteristics**

An adjustable aluminum rod is shaped to fit a front or back leg. The circular area goes over the shoulder or hip to help keep the splint in place. The splint's length can be adjusted. The splint is strategically taped onto the animal to secure the fracture and to secure the splint to the animal.

INSTRUMENT Aluminum Splint Rod



■ **Function**

To build a Thomas splint.

◆ **Common Name**

Splint rod

■ **Characteristics**

Straight rods of various diameters can be bent into Thomas splints. Two sections are made; one section goes around the hip or shoulder and the other goes beneath the foot. They are joined together with

adhesive tape and can be adjusted based on the length of the limb.

INSTRUMENT Splint-

Rod Form



• Function

To make circular and angled bends in an aluminum rod to create a Thomas splint.

■ Characteristics

This form has a series of curved forms where an aluminum rod can be placed and then bent to form the necessary curves for a Thomas splint.

Meta Splints



• Function

To stabilize fractures of the digits, carpals, or metacarpals.

■ Characteristics

Aluminum or plastic material is shaped like an elongated spoon. These splints are available in a variety of lengths and widths so they can be fitted to a cat or dog of any size. The splint is held in place with adhesive tape. Extensions are available, and they are used to lengthen the splint.

INSTRUMENT

Orthopedic Cast Saw



Manual cast saw



Electric cast saw

• Function

To remove hard plaster or fiberglass casts.

■ Characteristics

This instrument can be hand operated for the removal of small casts or can be electrically powered for the removal of large, thick casts. Both instruments must be used with care when casting material is being removed.

CHAPTER 21

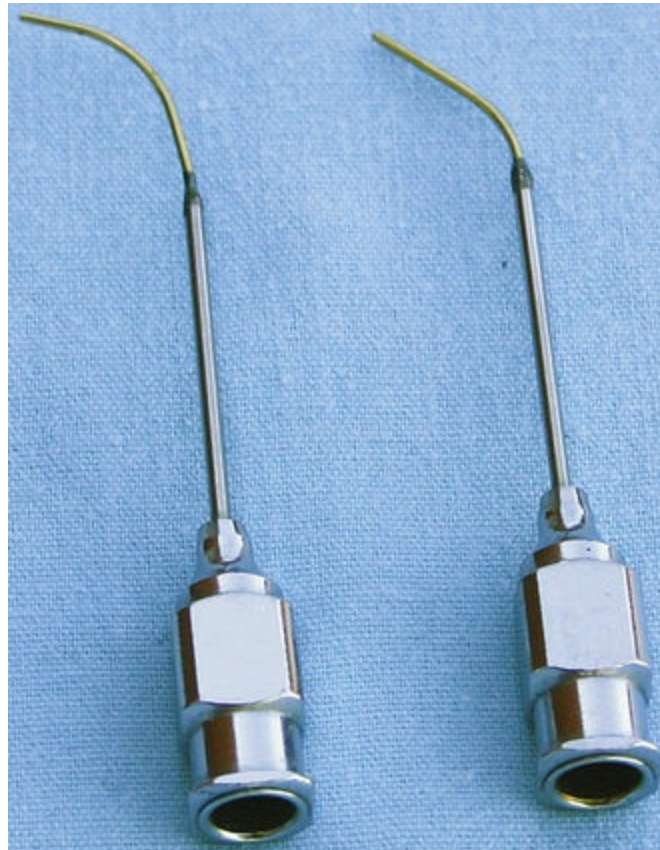
Ophthalmic Instruments



This chapter covers instruments that are used in ophthalmic surgery and in neurosurgery, but it is not a comprehensive list of the instruments that an ophthalmologist or neurosurgeon would have.

INSTRUMENT

Lacrimal Cannula



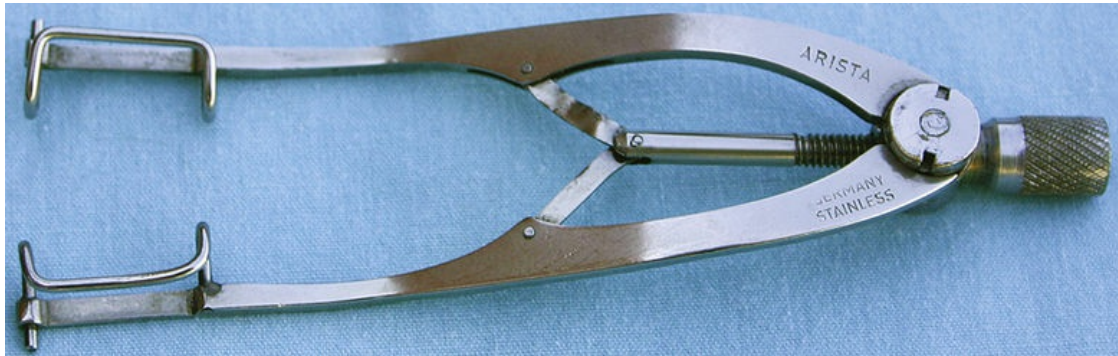
• Function

To flush the lacrimal duct; it can also be used to flush the anal gland duct.

■ Characteristics

A regular aluminum hub and needle shaft has a copper tube attached to the end that tapers the diameter of the shaft down to 23- and 30-gauge diameters. The cannula is available with a straight or an angled shaft.

Speculum



■ Function

To hold the eyelids apart for ophthalmic examination or surgery.

■ Characteristics

Gently curved ends are designed to slide under each eyelid; a spring device or a turning knob spreads the eyelids apart. There are several versions of eye speculums: Castroviejo, Graefe, and Barraquer.

INSTRUMENT

Castroviejo Needle Holder with Catch



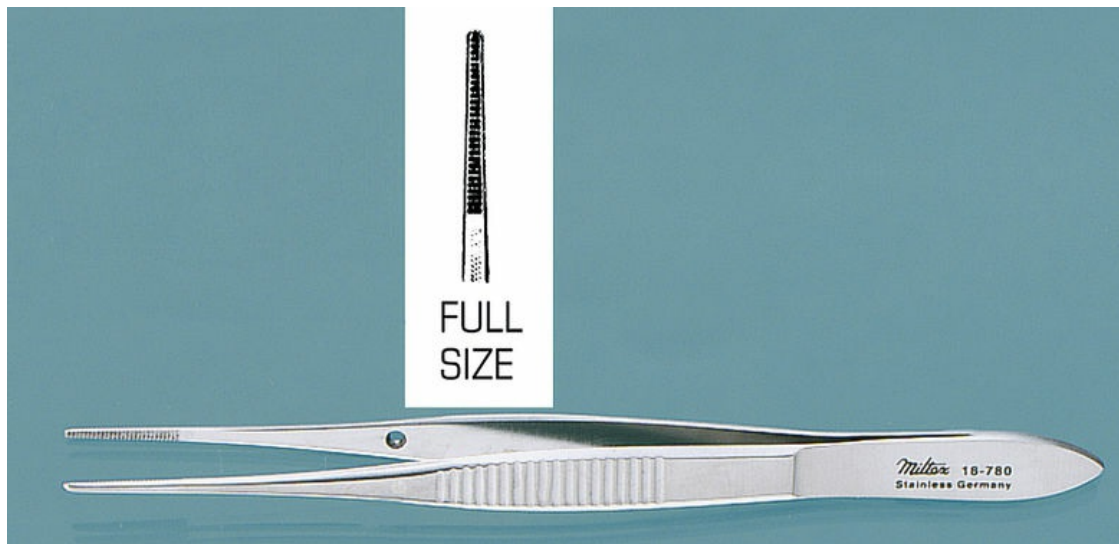
• Function

To hold the fine suture needles required for placing sutures in an eye and performing neurosurgery.

■ Characteristics

Jaws that hold fine needles are attached to spring-loaded handles that catch or release with gentle pressure.

INSTRUMENT **Eye-** **Dressing Forceps**



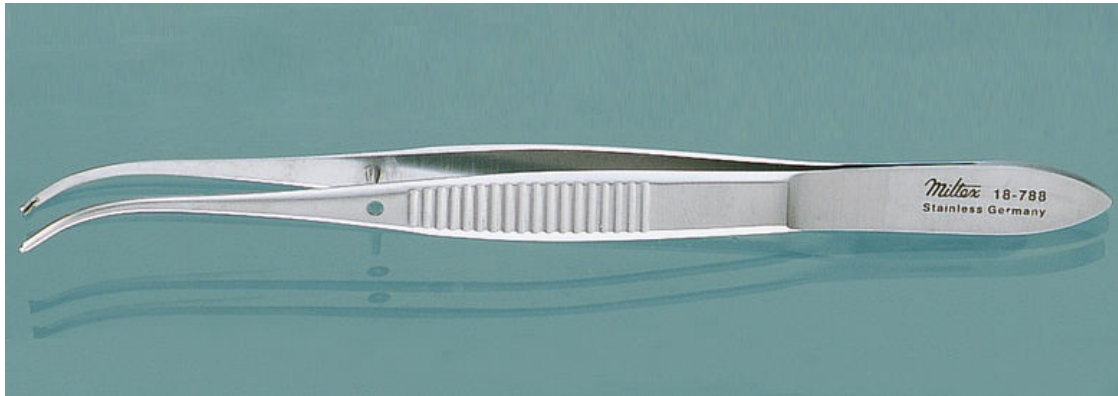
■ **Function**

To apply dressing materials to ophthalmic areas.

■ **Characteristics**

This forceps looks exactly like the dressing forceps found in regular surgical packs, but it is smaller and has finer jaws. It causes trauma to tissues and should be used to handle only inanimate objects. It may be straight or curved, and sizes range from 4¾ to 6 inches.

INSTRUMENT Half-Curved Tissue Forceps (1 × 2 Teeth)



• **Function**

To pick up tissue without causing trauma.

■ **Characteristics**

This forceps looks exactly like the tissue forceps found in regular surgical packs, but it is smaller and has finer jaws. The structure of the teeth allows tissue to be picked up without causing trauma. It ranges in length from 4¾ to 6 inches, and the teeth in the jaws may be 1 × 2 or 2 × 3. The forceps may be straight or curved.

INSTRUMENT Graefe Eye-Fixation Forceps with Catch



● **Function**

To grasp and hold tissues in an atraumatic manner.

■ **Characteristics**

A combination of Allis tissue forceps and tissue forceps, the jaws of the Graefe forceps are configured like the Allis forceps and the handles are like the tissue forceps. The catch is designed to hold when the handles are pressed together; it is released by flicking the catch with a finger.



• Function

To hold and crush tissues, occlude small vessels, or to tag and hold bridal or fine sutures.

• Common Name

Bulldog clamp

■ Characteristics

The jaws are similar to those of the other hemostatic forceps and also may be straight or curved. It functions when the handles are squeezed, opening the jaws in a crossover motion. Similar forceps are known as Dieffenbach, DeBakey, Glover, and Johns Hopkins forceps.

INSTRUMENT Beaver

Surgical-Knife Handle



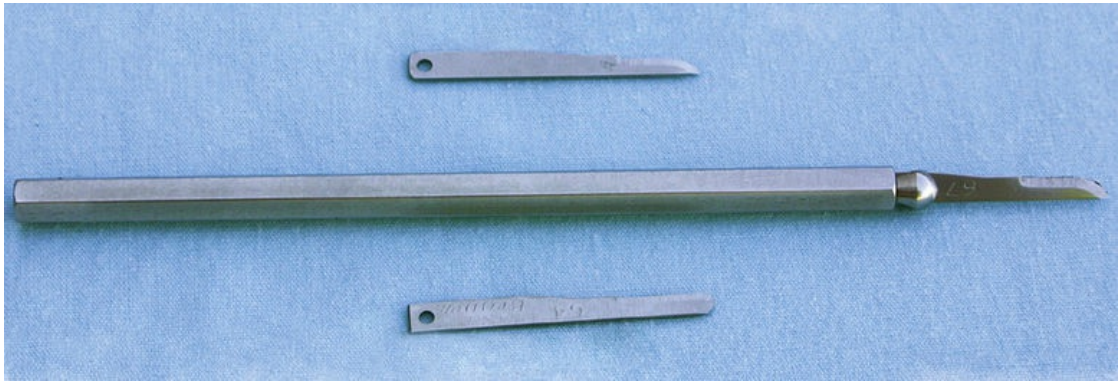
■ Function

To hold a Beaver surgical blade.

■ Characteristics

A blade is attached to this instrument by turning the round end, opening a slit into which the blade is positioned. Turning the end to its closed position secures the blade in place.

INSTRUMENT Beaver Surgical Blades — #64 and #67



• **Function**

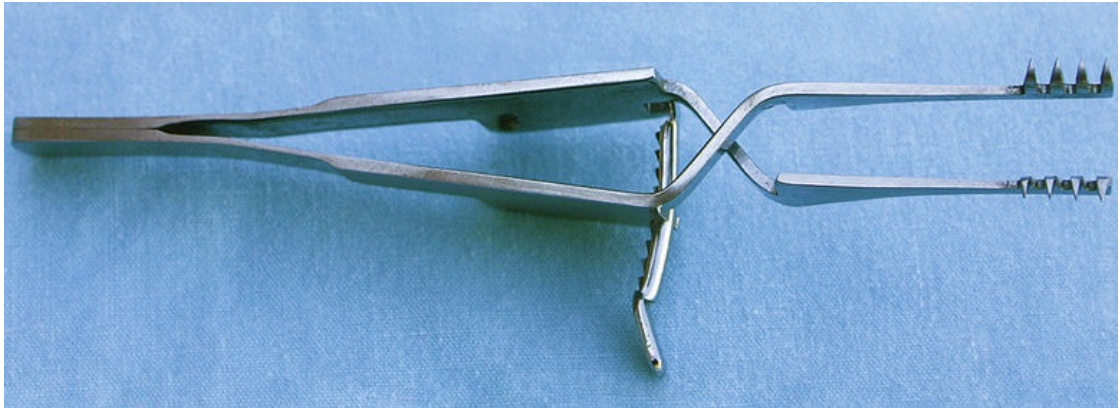
To make incisions and other cuts during microsurgery.

■ **Characteristics**

These blades are shaped exactly like the #10 and #15, but they are much smaller.

INSTRUMENT

Holzheimer Retractor



● Function

To hold tissues apart so as to view underlying tissues or organs.

■ Characteristics

A 4-inch self-retaining retractor with a ratchet, and it has sharp outward-facing prongs. The user squeezes the handles to open the retractor, and the ratchet holds it open. Similar retractors are known as Alm, Jansen, and Allport retractors.

INSTRUMENT

Strabismus Scissors



Straight

Curved

■ Function

To cut delicate tissues and to perform blunt dissection.

■ Characteristics

This scissors looks much like the Metzenbaum scissors, but it is more delicate. Its lengths range between 4 and 5½ inches; the blades may be curved or straight.

INSTRUMENT Tenotomy Scissors



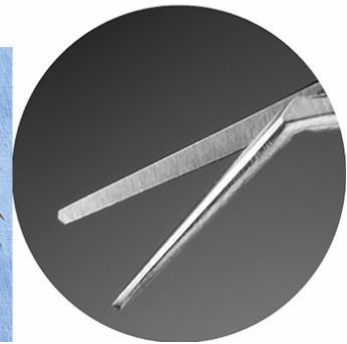
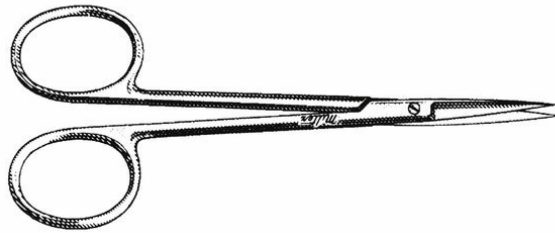
• Function

To divide and dissect the muscles and tendons of the eye during recession and resection for strabismus surgery.

■ Characteristics

Short, blunt, narrowed tips are straight or slightly curved and have a small handle. The length of the scissors is 4½ inches. The most common names for these scissors are Stevens, Ribbon Stevens, and Westcott.

Scissors



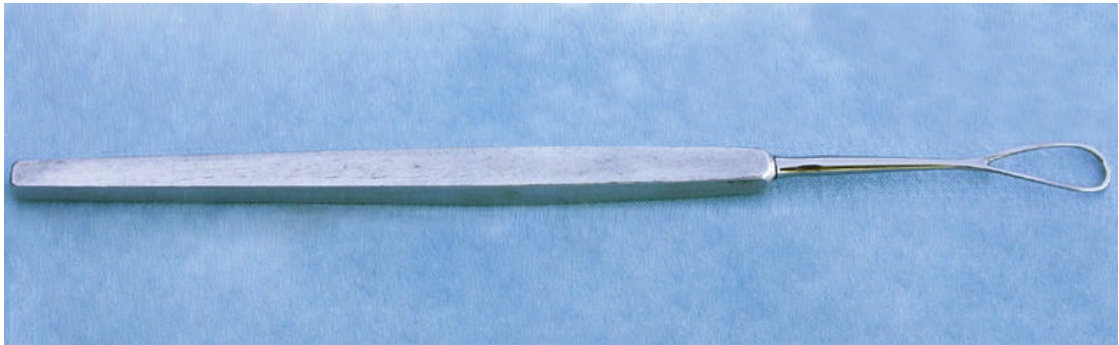
■ Function

To cut suture material and other nonviable materials.

■ Characteristics

The tips of these scissors look much like those of the operating scissors. The jaws are opened and closed by applying pressure to the spring handles. Some models have a standard scissor design. Tips can be found in the same combinations as those available for the operating scissors.

Loop



• Function

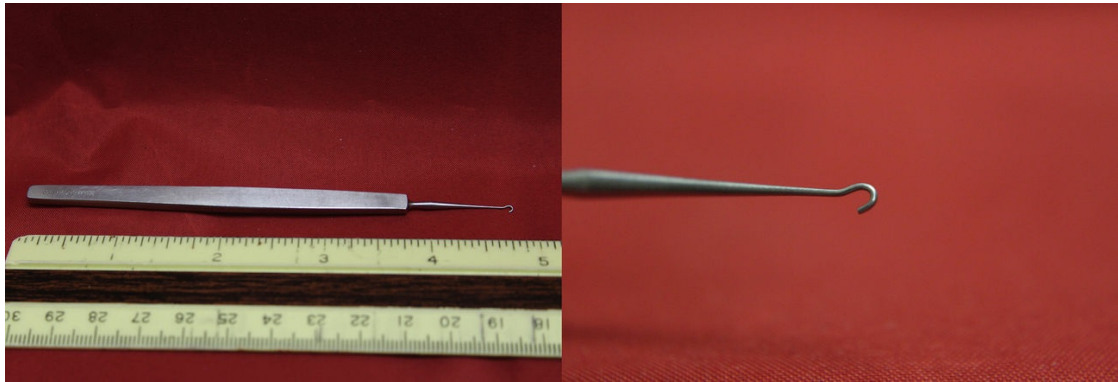
To hold the lens in place during an ophthalmic procedure.

■ Characteristics

A circular or oval loop is situated at the end of a long handle.

INSTRUMENT

Iris Hook



• Function

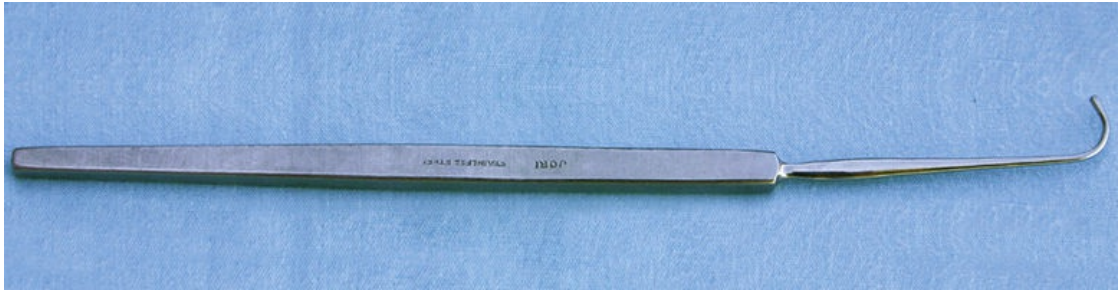
To hold the iris in place during an ophthalmic procedure.

■ Characteristics

A tiny hook is situated at the end of a long handle. These hooks are known as Tyrrell or Shepard hooks.

INSTRUMENT

Strabismus Hook



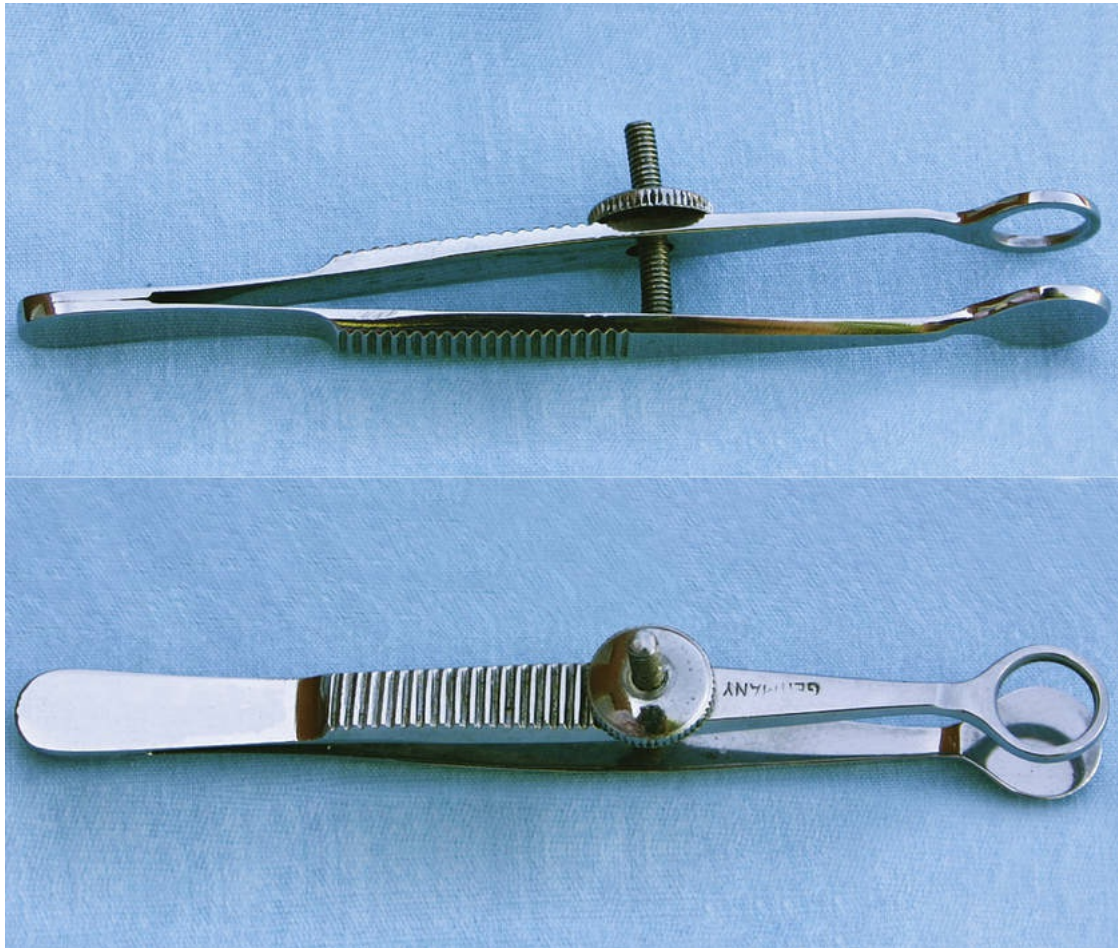
• Function

To hook or stabilize the muscles surrounding the eyes.

■ Characteristics

A blunt-ended hook is situated at the end of a long handle. These hooks are known as Graefe or Jameson hooks.

INSTRUMENT Chalazion **Forceps**



■ **Function**

To isolate a chalazion (stye) for removal by stabilizing and everting the eyelid. It also provides hemostasis and a stable surface to excise the stye.

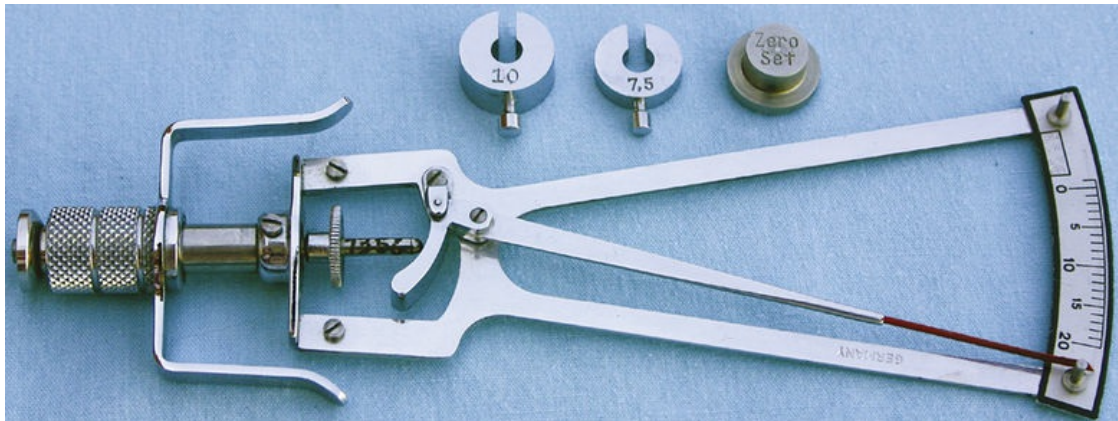
■ **Characteristics**

The ends of this instrument are both rounded and smooth. One side

has a solid round panel, while the other end has an open circle. To bring the ends together, the user turns a small knob on the handle. The ends may be circular or oval, and the instrument may be straight or curved. Similar forceps are called Lambert, Ayers, Desmarres, and Hunt forceps.

INSTRUMENT

Tonometer



■ Function

To measure intraocular pressure.

■ Characteristics

One end of this instrument is placed on the surface of the eye; this engages a small needle-gauge that measures the ocular pressure in the eye. Small weights included with the tonometer measure whether the pressure is higher than the original setting on the gauge.



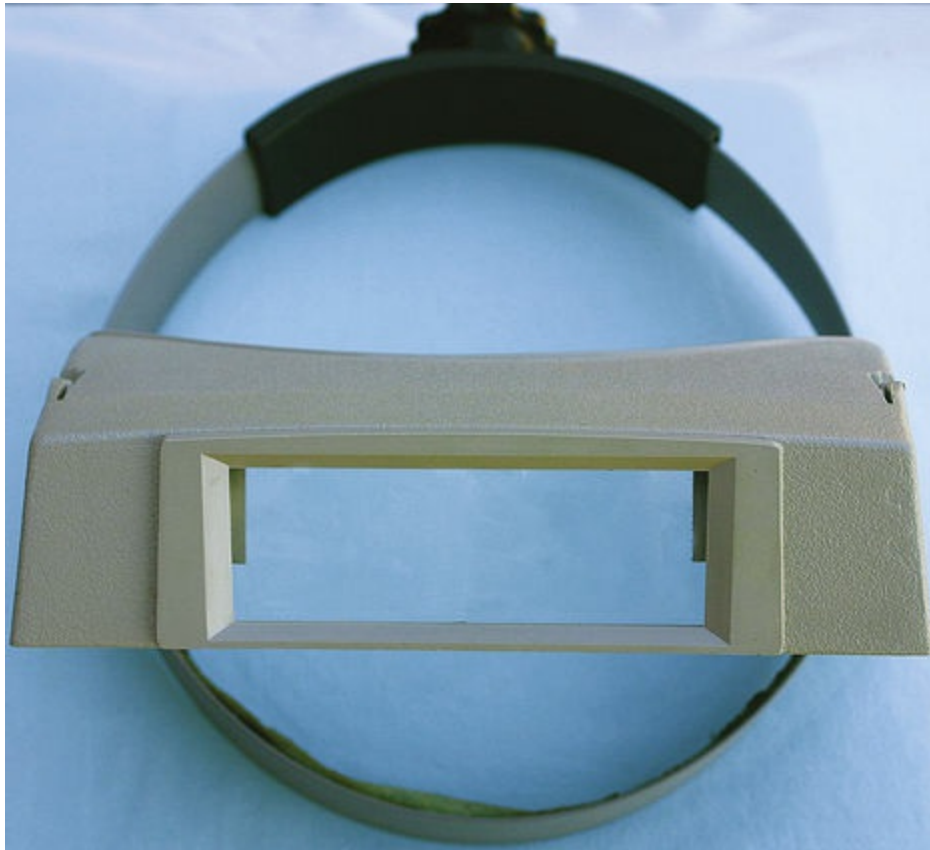
■ Function

To measure intraocular pressure.

■ Characteristics

The end of this instrument is placed on the surface of the eye; this engages a pressure plate that measures the ocular pressure of the eye. The pressure is displayed in a digital window.

Loupe



• Function

To magnify areas of concern; usually worn during microsurgery.

■ Characteristics

A plastic adjustable headband is fitted with magnifying glasses. Some models allow the lens to be propped up when normal vision is sufficient.

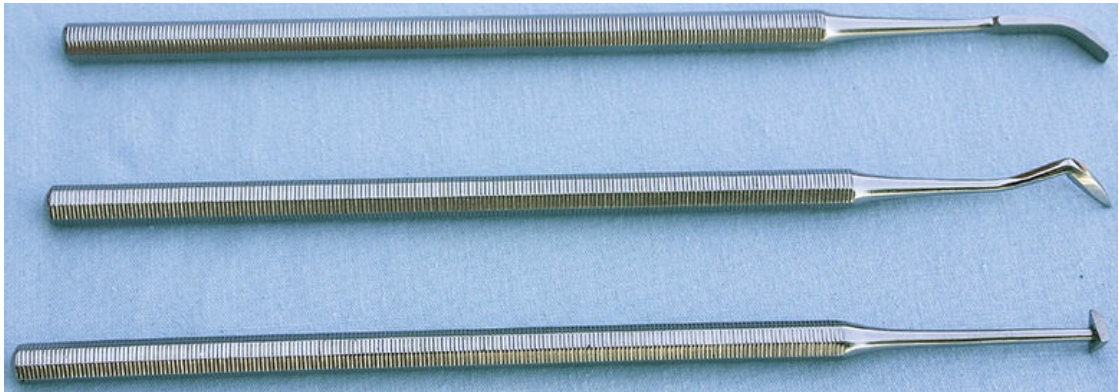
CHAPTER 22

Dental Instruments

This chapter covers dental instruments that are used in most routine dental cleanings. However, this is not a comprehensive list of all the dental instruments available.



INSTRUMENT Tartar Scrapers—Single-Ended



• **Function**

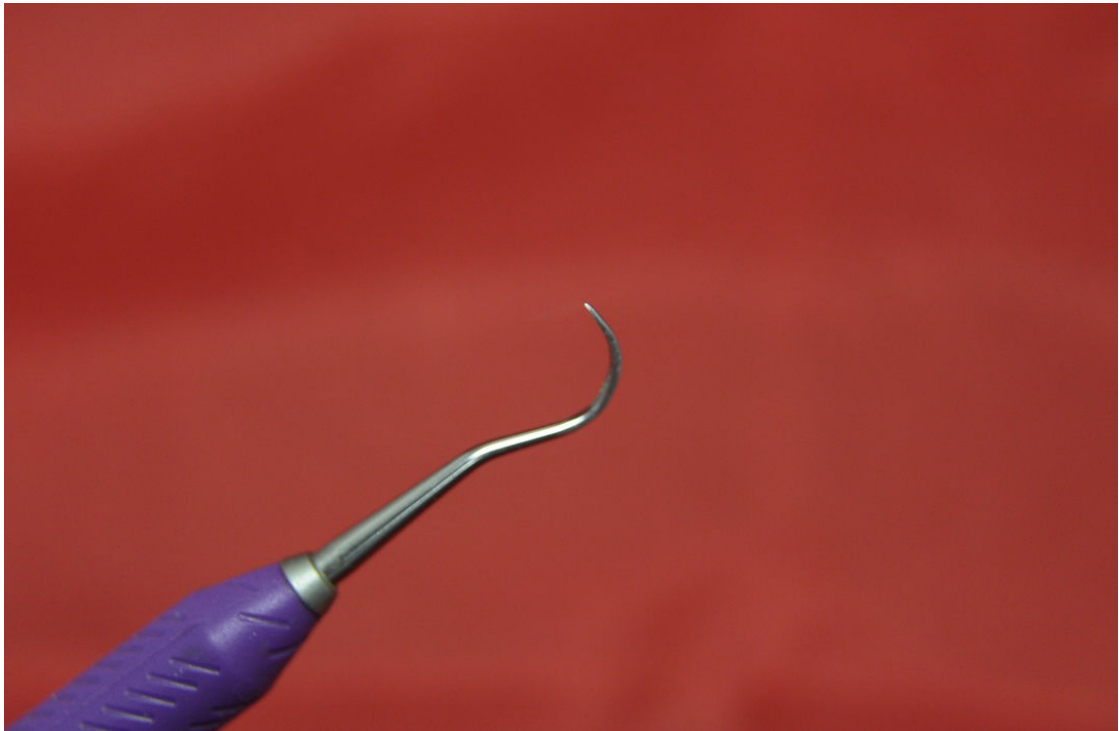
To remove tartar and plaque from the surfaces of teeth.

■ **Characteristics**

These scrapers are available in a variety of shapes and angles that fit specific teeth.

INSTRUMENT **Jacquette**

Tartar Scalers



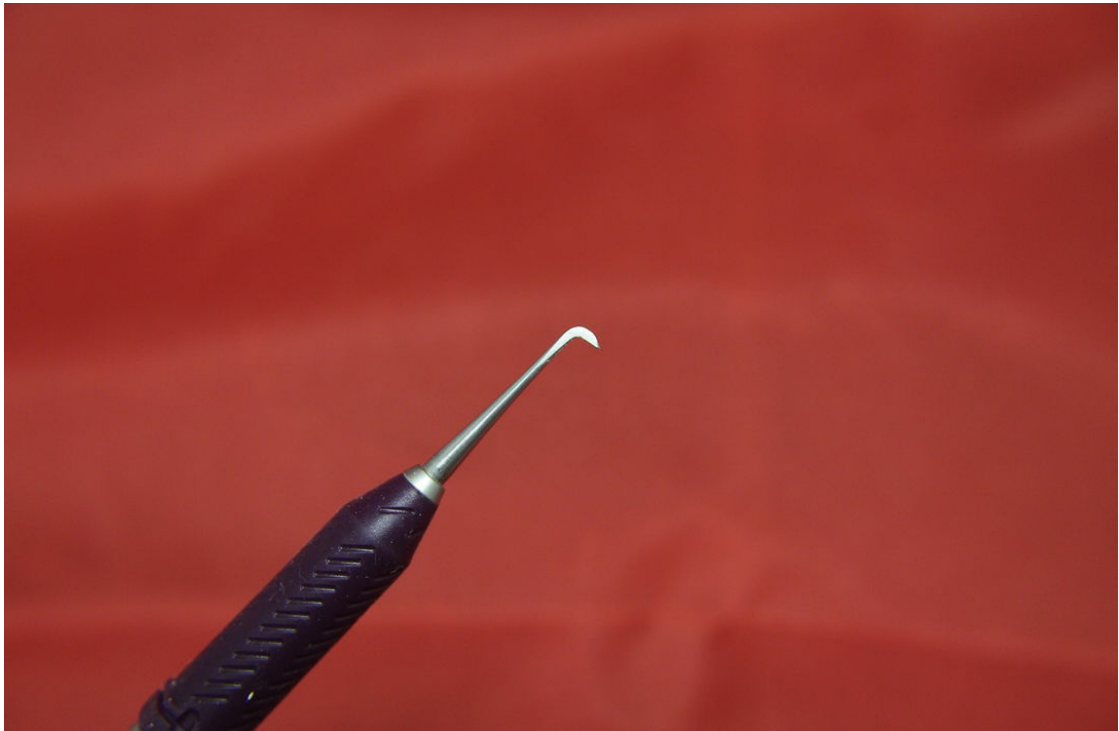
• **Function**

To remove tartar and plaque from the supragingival surfaces of teeth.

■ **Characteristics**

The Jacquette 33 Scaler is used interproximally on the anterior teeth.
The H5 is used interproximally on the posterior teeth.

INSTRUMENT Morse 0-00 Scaler



• **Function**

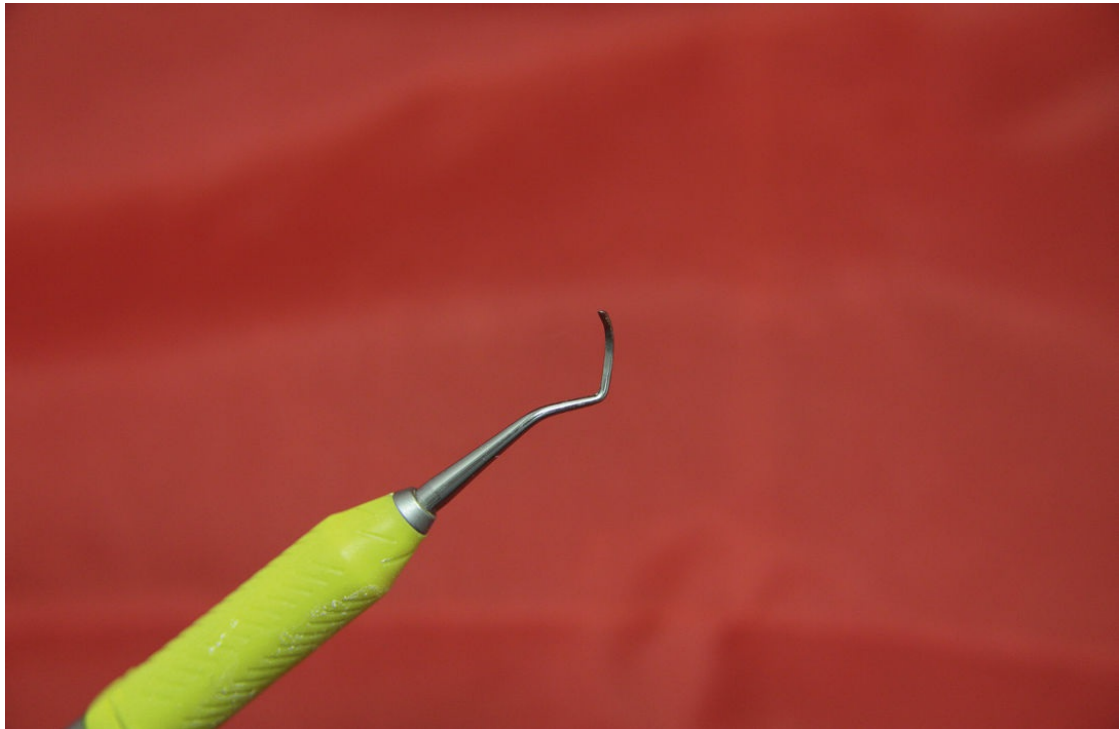
To remove tartar and plaque from the supragingival surfaces of teeth.

■ **Characteristics**

This thin blade is at a 90-degree angle designed for supragingival scaling of crowded or overlapping teeth and is also used for stain removal.

INSTRUMENT Columbia

13/14 Universal Curette



• **Function**

To remove tartar from the subgingival and supragingival surfaces of teeth.

■ **Characteristics**

Curettes are used on the buccal and lingual surfaces or the anterior and posterior teeth. It has a short shank with a medium to thin blade. There are two ends designed to be flipped to the other end as you move from buccal to lingual.

1/2 Curette



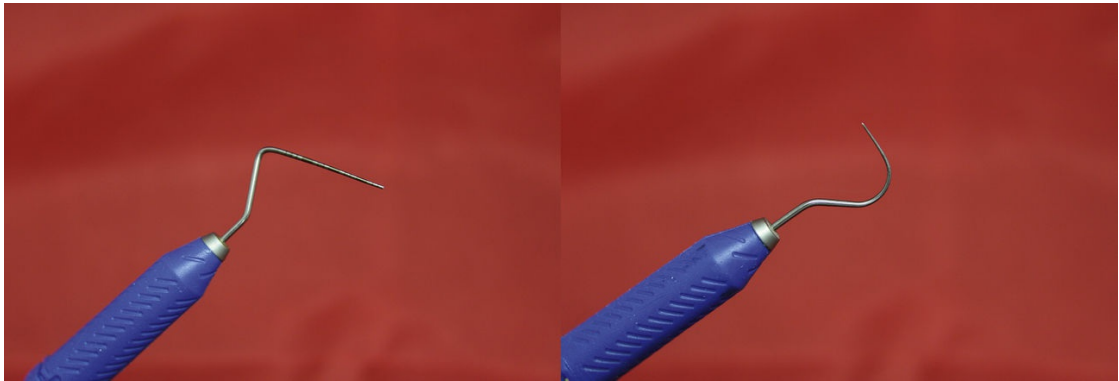
• Function

To remove tartar from the subgingival and supragingival surfaces of teeth.

■ Characteristics

The Barnhart curettes are used on the buccal and lingual surfaces posterior teeth as well as other teeth throughout the mouth. It has a long shank and thin blade. There are two ends designed to be flipped to the other end as you move from buccal to lingual.

Probe and Explorer



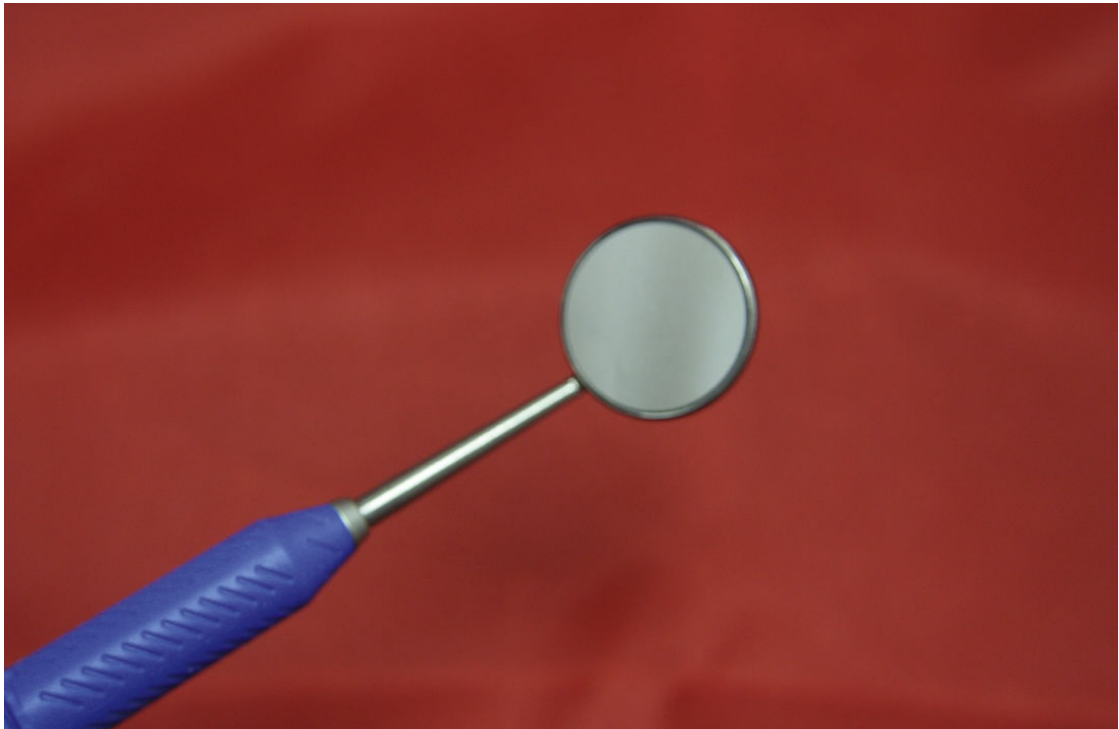
■ Function

Probe used to examine teeth for depth of the sulci or periodontal pocket. Explorer evaluates surface irregularities, caries and calculus detection, furcation involvement, and exploration of pockets

■ Characteristics

The explorer end has a blunt tip and graduations that are measured in millimeters; it is placed into the sulcus on the long axis of the tooth to measure the depth of the pocket. The probe end is half curved and ends in a fine point. It is dragged across the surface of the tooth to check for missed tartar, while the pointed end is used to check for soft spots.

Mirror



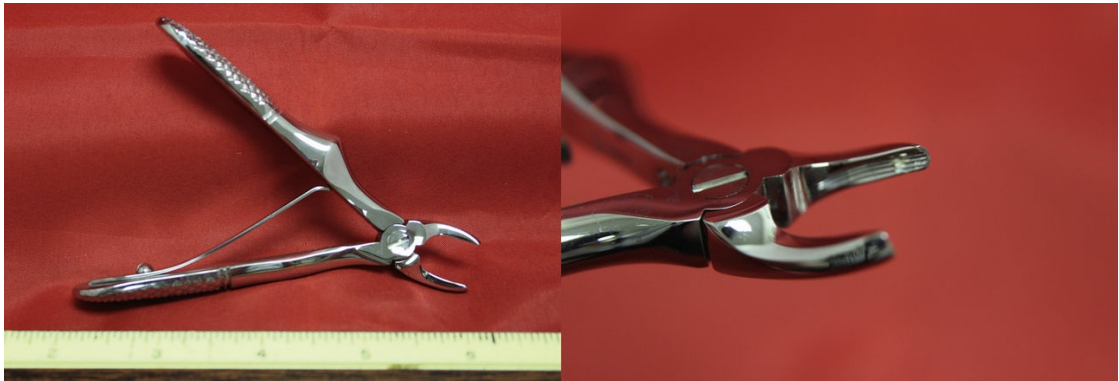
■ Function

To view and illuminate difficult to see tooth surfaces in the mouth.

■ Characteristics

The mirror is moved about the mouth on the lingual or palette surfaces and is also used as a buccal retractor to view those surfaces.

Removing Forceps



• Function

To remove tartar or calculus from the supragingival surfaces of teeth.

■ Characteristics

The tartar removing forceps is used to quickly break up accumulations of tartar on the tooth surfaces. Many of them have one bent jaw as well as the one pictured here. Care must be taken to not apply excess pressure to twist while applying pressure to break the tartar.

INSTRUMENT Tooth-Splitting and Separating Forceps



■ **Function**

To split multirooted teeth for removal.

■ **Characteristics**

A flat, sharply angled forceps provides maximal torque to split a tooth.

INSTRUMENT Incisor- and Root-Extracting Forceps



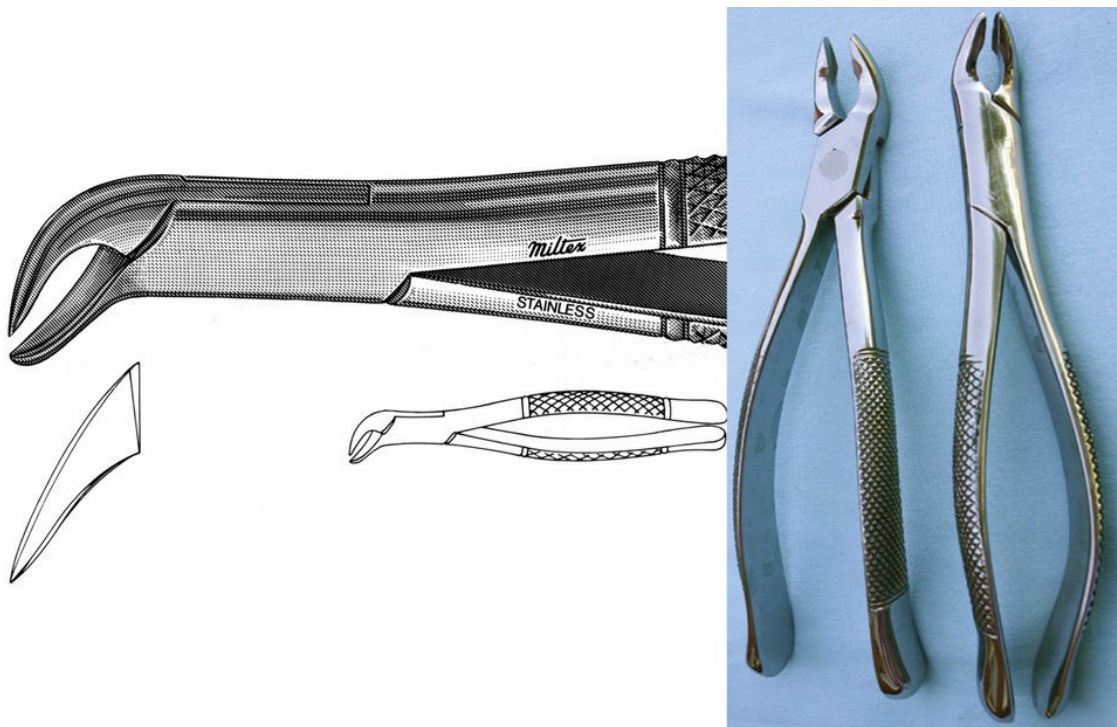
• **Function**

To grasp the small incisor or the root of a tooth that is to be removed.

■ **Characteristics**

Fine jaws have small indentations on a handle that is almost straight.

INSTRUMENT Incisor, Canine, and Premolar Extracting Forceps



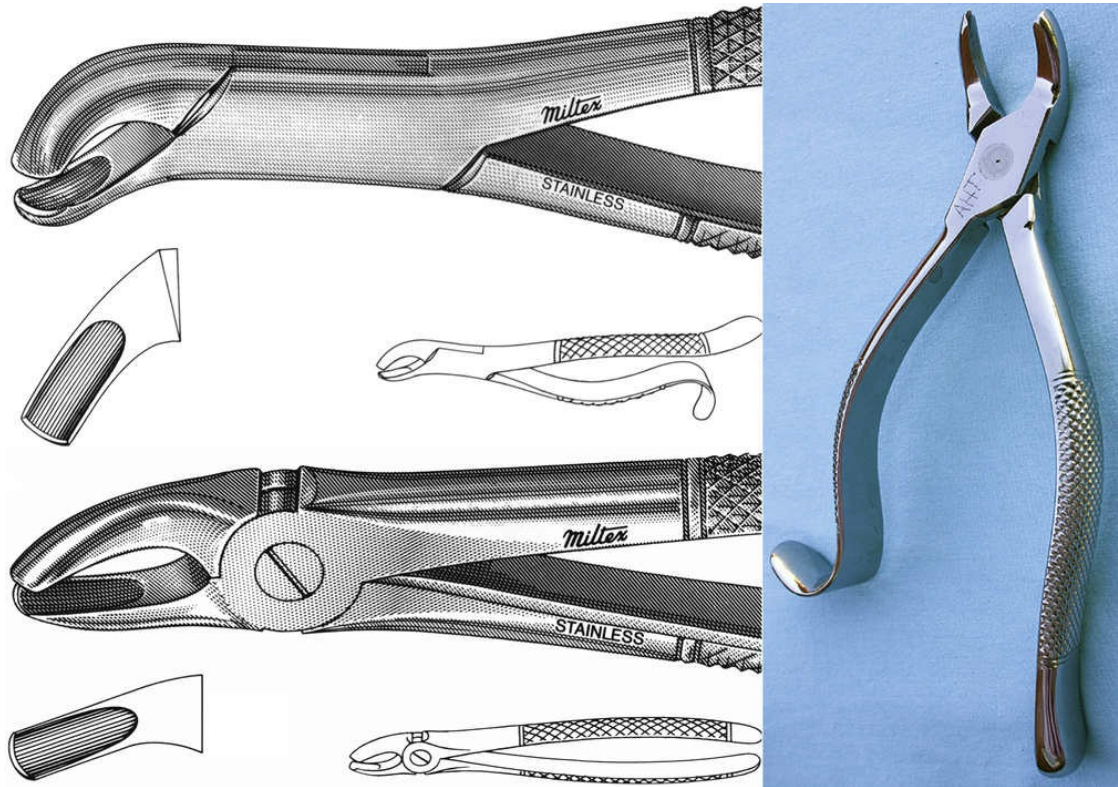
■ **Function**

To aid in the removal of the incisor, canine, and premolar teeth.

■ **Characteristics**

These jaws have deeper indentations to accommodate larger teeth; the handles are slightly bent to facilitate the removal of teeth.

INSTRUMENT **Molar- Extracting Forceps**



■ **Function**

To aid in the removal of molars.

■ **Characteristics**

The jaws of this forceps are very deep, and the handles are usually sharply angled to allow access to the tooth and to facilitate its removal.

INSTRUMENT **Dental**

Elevators



■ **Function**

To loosen a tooth from the periodontal ligament before its extraction.

■ **Characteristics**

These elevators have pockets of various shapes to fit the surface of the particular tooth and various lengths to accommodate various teeth.

INSTRUMENT **Dental**

Cavitron with Polisher



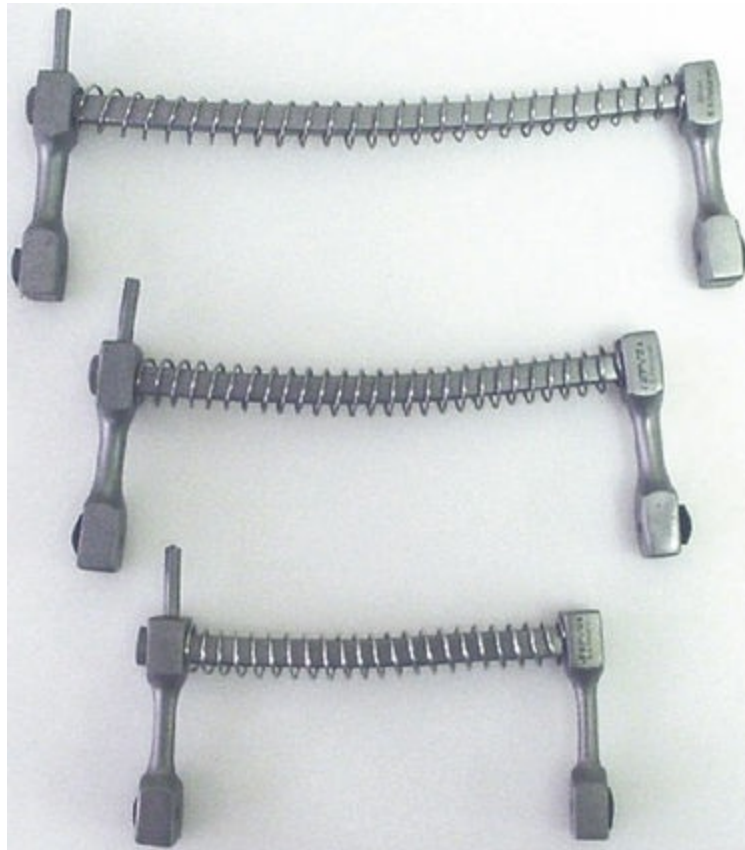
■ **Function**

To remove tartar from teeth, then polish them so they are smooth.

■ **Characteristics**

Ultrasonic motion removes tartar with a handpiece and heads that are angled to conform to a tooth's surface. The unit requires water to keep the teeth cool; otherwise, they would be damaged by the heat created by the high speed of the ultrasonic motion. The polisher is usually a separate handpiece. It uses a pastelike polishing compound that smoothes the tooth surface so as to eliminate grooves caused by hand and ultrasonic scaling. The polisher operates at high speeds and can cause heat damage to the tooth. It is imperative to use polishing paste and to touch the tooth surface for only a second or two before moving on to the next tooth.

INSTRUMENT Spring-Mouth Speculum, or Gag



■ **Function**

To hold open the mouth of a small animal.

■ **Characteristics**

Rubber fittings on each blade are designed to cradle the canine teeth. The blades are squeezed together and fitted over the canine teeth; the spring gently opens the mouth. The blades should not be forced apart once fitted over the teeth, because that can injure the patient's mouth.

INSTRUMENT

Prophy

Paste Cups



■ Function

To hold the polish used to smooth the surface of the tooth.

■ Characteristics

A small plastic cup. It may be disposable or may be attached to a ring and reused.

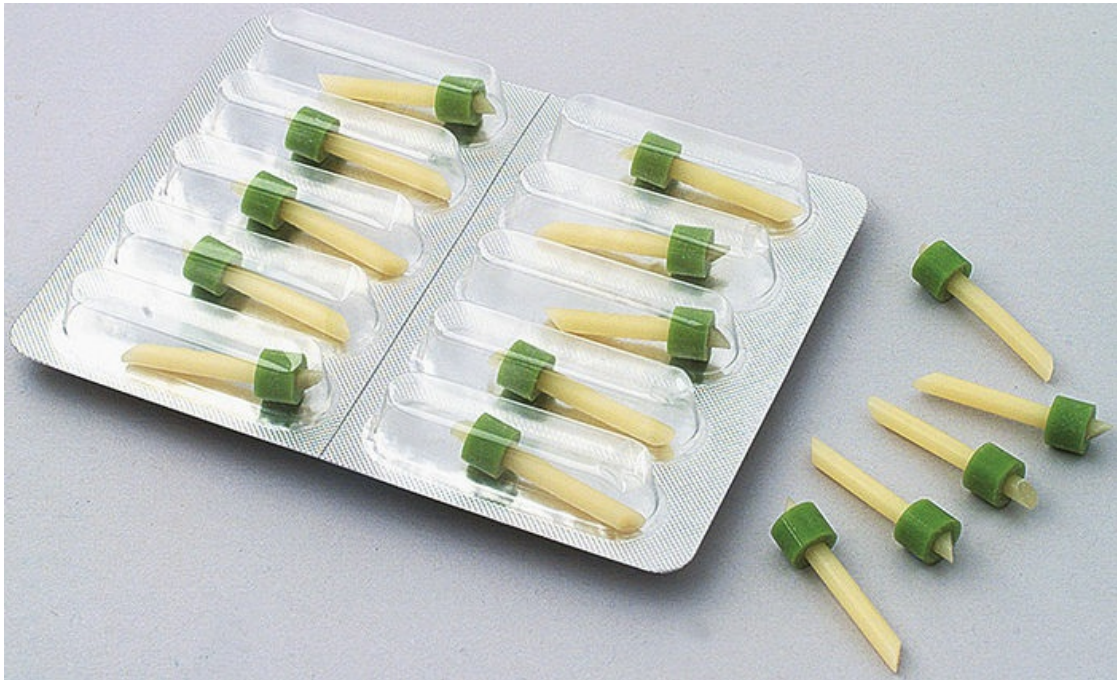
CHAPTER 23

Teat Instruments



This chapter covers instruments that are used in cattle, especially dairy cattle, to correct defects and problems with teats.

INSTRUMENT Teat Dilator



• Function

To open the teat canal.

■ Characteristics

A gradually widening instrument is slipped into the teat canal to open it.

INSTRUMENT

Teat Slitter



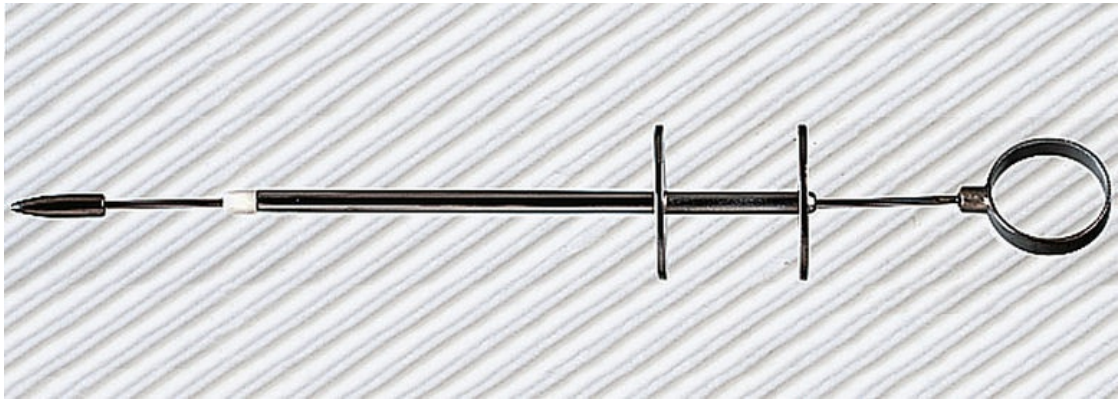
■ Function

To make an incision from the inside to the outside.

■ Characteristics

The blade of this slim instrument is hidden inside the shaft. The instrument is slipped into the teat canal, and the blade is released by pushing on the ring; that allows an incision to be made from the inside to the outside.

INSTRUMENT Teat Tumor Extractor



• **Function**

To remove tumors or other fibrous material from the teat canal.

■ **Characteristics**

A bullet-shaped tip is slender enough to be introduced into the teat canal. Once the instrument has passed the tumor, it is opened, and the sharp blades on the underside of the tumor “bullet” slice through the tumor as the instrument is removed from the canal.

Teat Curette



• Function

To scrape the inside of the teat canal and remove obstructions or tumors or to take biopsy specimens.

■ Characteristics

The bottom of the loop has a sharp edge and is affixed to a handle. The loop gathers tissue as it is pulled out of the teat.

INSTRUMENT **Lichty**

Teat Knife or Bistoury



Sharp tip



Blunt tip

• **Function**

To open stenotic teats by incising through scar tissue or other constricting tissue.

■ **Characteristics**

A slim stainless steel blade is attached to a handle. The point or tip of the blade may be sharp or blunt.

INSTRUMENT

Udder

Infusion Cannula



■ Function

To administer medications into the teat canal. Other possible uses include draining a mastitic quarter, keeping a teat canal or sphincter open during and after surgery, flushing an abscess, and performing a peritoneal tap.

■ Characteristics

A blunted needle-like tube can be inserted into the teat canal; by using a syringe, medication can then be injected.

INSTRUMENT Mastitis

Test Kit



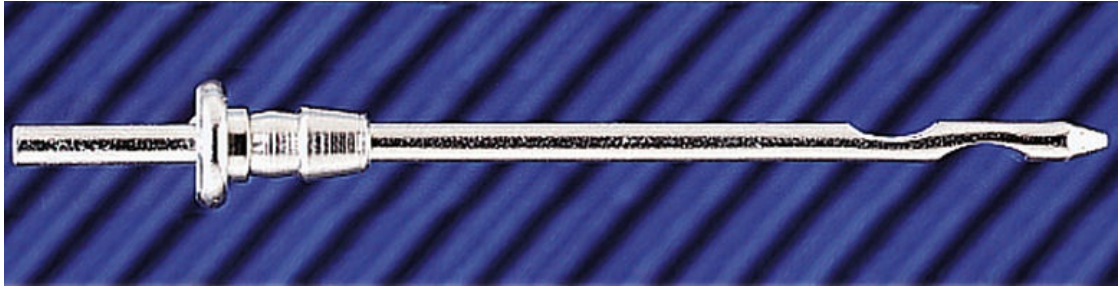
■ Function

To screen for and diagnose mastitis in cattle.

■ Characteristics

The paddle is divided into four quarters that correspond to the four teats. Milk from each quarter is placed into its corresponding circle. A reagent is mixed with the milk, and if agglutination is seen, mastitis is suspected.

INSTRUMENT Milking **Tubes**



• **Function**

To keep an injured teat open for milking.

■ **Characteristics**

These tubes are inserted after surgery or after an injury that may cause the teat to swell. They help to keep the canal patent while the teat heals.

INSTRUMENT Udder Support



• Function

To support an injured or pendulous udder.

■ Characteristics

A net is placed around the udder, then strapped to the cow's body. This transfers the weight of the udder to the cow's back and keeps the udder from being stepped on or injured.

CHAPTER 24

Surgical Instrument Packs



The following is the list of surgical instruments that are often packed together and sterilized by veterinary technicians. Each veterinarian will have their own preference as to what goes into a particular pack. For example, some veterinarians like curved forceps while others like straight. The following lists have been kept general in nature and can be interchanged with other instruments of choice.



Instruments in the table below correspond to the photo above

and are in order from left to right starting at the top.

Spay (Ovariohysterectomy) Packs

Canine/Feline

Quantity	Instrument	Chapter Photo Reference
2	Backhaus Towel Forceps—5.5"	16
4	Backhaus Towel Forceps—3.5" or Jones Towel Forceps	16
2–4	Halsted Mosquito Forceps—curved or straight	16
2	Kelly Forceps or Crile Forceps—curved or straight	16
2–4	Rochester Carmalt Forceps—curved or straight	16
1	Metzenbaum and/or Mayo Scissors	18

Table Continued

Quantity	Instrument	Chapter Photo Reference
1	Olsen-Hegar or Mayo-Hegar Needle Holder	18
1	Operating Scissor—sharp/blunt, sharp/sharp, blunt/blunt	18
1	#3 Scalpel Handle	17
1	Snook's Ovariectomy Hook	17
1	Adson Brown Tissue Forceps	16
1	Allis Tissue Forceps	16
1	Foerster Sponge Holding Forceps	16
*1	Groove Director—optional	17



Instruments in the table below correspond to the photo above

and are in order from left to right starting at the top.

Neuter (Orchiectomy) Surgical Pack

Canine

Quantity	Instrument	Chapter Photo Reference
4	Backhaus Towel Forceps—3.5" or Jones Towel Forceps	16
1	Olsen-Hegar or Mayo-Hegar Needle Holder	18
2	Halsted Mosquito Forceps—curved or straight	16
2	Kelly Forceps or Crile Forceps—curved or straight	16
Table Continued		

Quantity	Instrument	Chapter Photo Reference
2	Rochester Carmalt Forceps—curved or straight	16
1	Allis Tissue Forceps	16
1	Metzenbaum and/or Mayo Scissors	18
1	Adson Brown Tissue Forceps	16
1	#3 Scalpel Handle	17



Instruments in the table below correspond to the photo above

and are in order from left to right starting at the top.

Neuter (Orchiectomy) Surgical Pack

Feline

Quantity	Instrument	Chapter Photo Reference
2	Halsted Mosquito Forceps—curved or straight	16
1	Metzenbaum Scissors	18
1	#3 Scalpel Handle	17



Instruments in the table below correspond to the photo above and are in order from left to right starting at the top.

General Surgical Pack

Quantity	Instrument	Chapter Photo Reference
4	Backhaus Towel Forceps—3.5" or Jones Towel Forceps	16
2	Backhaus Towel Forceps—5.5"	16
2-4	Halsted Mosquito Forceps—curved or straight	16
2	Kelly Forceps or Crile Forceps—curved or straight	16
4	Rochester Carmalt Forceps—curved or straight	16

Table Continued

Quantity	Instrument	Chapter Photo Reference
1	Olsen-Hegar or Mayo-Hegar Needle Holder	18
1	Operating Scissor—sharp/blunt, sharp/sharp or blunt/blunt	18
1	Metzenbaum and/or Mayo Scissors	18
1	Adson Brown Tissue Forceps	16
1	#3 Scalpel Handle	17
1	Foerster Sponge Holding Forceps	16
1	Allis Tissue Forceps	16
*1	Groove Director—optional	17



Instruments in the table below correspond to the photo above

and are in order from left to right starting at the top.

Orthopedic Surgical Pack

Quantity	Instrument	Chapter Photo Reference
1	Bone Mallet	20
1	Osteotome	20
1	Periodontal elevator	20
1	Intramedullary Pin Setter	20
1	Intramedullary Pin Chuck	20
1	Wire Twister	20
1	Ruskin Rongeur	20
1	Lambert-Lowman or Kern Bone Holding Forceps	20
Table Continued		

Quantity	Instrument	Chapter Photo Reference
1	Gigli Wire Saw with Handles	20
1	Intramedullary Pin Cutter	20

Ancillary Orthopedic Instruments—Usually packed and sterilized in groups and separately from the general orthopedic instruments. Photos of these can be found in [Chapter 20](#).

- Intramedullary Pins—assorted sizes—usually 2 of ea
- Orthopedic Wire—1 or more sizes
- Bone Plate & Screws Kits
- External Fixation Kits



Instruments in the table below correspond to the photo above and are in order from left to right starting at the top.

Ophthalmic Surgical Instruments

Quantity	Instrument	Chapter Photo Reference
1	Castroviejo Needle Holder (across the top)	21
1	Iris Hook	21
1	Lewis Lens Loop	21
1	Strabismus Hook	21
1	Iris Scissors	21
1	Tenotomy Scissors	21
1	Graefe Eye-Fixation Forceps with Catch	21

Table Continued

Quantity	Instrument	Chapter Photo Reference
1	Half-Curved Tissue Forceps 1 × 2 teeth	21
1	Holzheimer Retractor	21
1	Beaver Surgical Knife Handle (Micro Blade)	21
1	Eye Speculum	21
1	Chalazion Forceps	21
Optional	Serrefine	21



Instruments in the table below correspond to the photo above and are in order from left to right starting at the top.

Dental Prophylaxis Kit

Quantity	Instrument	Chapter Photo Reference
1	Dental Mirror	22
1	Depth Probe and Explorer	22
1	Columbia 12/14 Universal Curette	22
1	Barnhart 1-2 Curette	22
1	Morse Scaler 0-00 or	22
1	Jacquette Scaler 33/H5	22
1	Gracey Posterior/Anterior Scaler	22
1	Tartar Removing Forceps	22



Instruments in the table below correspond to the photo above and are in order from left to right starting at the top.

Dental Periodontal Extraction Kit

Quantity	Instrument	Chapter Photo Reference
1	Tooth Splitting and Separating Forceps	22
1	Incisor-Root Extracting Forceps	22
2	Incisor, Canine, and Premolar Extracting Forceps	22
1	Molar Extracting Forceps	22
1 each	Periodontal Elevators—sizes A–D	22

CHAPTER 25

Care of Instruments



Surgical instruments are designed to correct physical problems that require surgery. When a good-quality surgical instrument is used for the right job, that instrument should last a lifetime. That life can be extended if, during that use, it is cleaned and maintained properly.

Before using new instruments, it is important to take the time to inspect each one to ascertain that it is in good shape. That way, if one is defective, it can be sent back to the company for an exchange or refund. Any instrument that does not meet the following standards should be rejected.

All instruments should be checked for roughness or pitting of the surface. All instruments with moving parts should be checked for smoothness of engaging and disengaging and for proper meshing of the jaws. If two parts of an instrument are held together by a screw, the screw should be tight. If any such defects exist, they facilitate corrosion, rusting, and staining.

Certain specific aspects should be examined in some instruments. The box lock of a hemostat should clamp at the first tooth and produce an audible snap as it engages. When the instrument is reversed so that the jaws are being held, the ratchet should not spring open when tapped on a table or the palm of a hand. Scissors should be checked for sharpness. A good scissors should cut through four layers of gauze when just the tips of the blades are being used. A scissors shorter than 4 inches should be able to cut through no fewer than two layers. A needle holder should be checked by clamping an ordinary suture needle into its jaws and closing the box lock to the second tooth; it should not be possible to

turn the needle with one's fingers. Soiled instruments must be cleaned as soon as possible after use. Within 10 minutes, blood or tissue left on an instrument starts to break down the instrument's surface. This causes the instrument to become stained, pitted, or rusty. If instruments cannot be cleaned within that time frame, they should be kept moist by being placed in a wet towel; however, they should not be soaked, because that only hastens the breakdown of instruments.

Instruments are cleaned by using a scrub brush and cleanser or an ultrasonic cleaner with cleanser. Cleaning detergents and solutions must have a pH of 7 or 8.5 and must be diluted properly to prevent instrument breakdown. All the instruments in a pack are to be cleaned, even if they have not been used. The scrub brushes used should be designed specifically for medical instruments. Too hard a bristle can cause damage and fail to get into the cracks and crevices that exist in individual instruments. The instruments should be opened and placed in the cleaning solution. Each instrument must be scrubbed, with attention to the grooves in the jaws, the box locks, and the joints. Then they should be rinsed in water and dried thoroughly, again with attention to the box locks and joints. The moving parts, such as joints, box locks, and ratchets, should be lubricated, using a lubricant that is specially designed for surgical instruments and is steam penetrable.

An ultrasonic cleaner provides rapid and thorough cleaning of an instrument. It works by producing bubbles that implode against the instrument, "blasting" the debris from the surface. This action cleans the instrument in places where brushes cannot reach. Before using this type of cleaner, all the instruments should be divided into two groups: sharp and non-sharp. Then they should be separated according to type of material, such as brass, stainless steel, and so forth. All ratchets should be opened, and any instrument designed to be taken apart should be separated. The instruments are placed in the rack provided, without overfilling it. The cleaner is then filled with water and the cleansing agent added. The cleansing agent should be specifically designed for an ultrasonic cleaner. The timer is set for 10 to 15 minutes. The tray should be removed promptly once the timer has gone off, and the instruments should be rinsed thoroughly with water, then carefully

dried and lubricated. Many elements contribute to the breakdown of instruments. The top three are tap water, surgical wraps, and moisture.

By learning about them, users can prevent high-quality instruments from becoming stained, pitted, or rusted. An improper water source for an autoclave can be an instrument killer. Tap water contains minerals that, when vaporized, become concentrated and form layers on an instrument. As the instrument dries, the minerals cause pitting and corrosion. An autoclave should always be filled with distilled water to prevent the buildup of minerals. If an autoclave is supplied by a direct line, it is important to check the owner's manual for instructions on cleaning the steam-line filter. Surgical wraps also cause instrument breakdown. Most detergents are alkaline based, and most washing machines do not rinse well enough to remove the metallic ions that remain in materials. The instruments are wrapped in these fabrics and placed in an autoclave that produces steam, which vaporizes these metallic ions and deposits them onto the surgical instruments. For this reason, an autoclave should be cleaned on a weekly basis to prevent the buildup of minerals and metallic ions. Surgical wraps should be sent through two rinse cycles. It is also advisable to avoid overloading the washing machine when cleaning surgical wraps.

Moisture also damages instruments. Moisture damage can occur if the autoclave is not allowed to go through the drying cycle and if the instruments are not allowed to dry on a rack before being put away. These practices cause the wrapped packages to develop condensation, which not only contaminates the pack but also causes the instruments to rust or corrode. Soaking instruments in cold-sterilization solutions for extended periods causes rust unless a rust-prohibitor solution is being used.

APPENDIX A

Veterinary Equipment and Instruments

Advanced Monitors Corporation

7098 Miratech Dr. Ste. 130

San Diego, CA 92121

Phone: 877-838-8367

Website: www.pet-temp.com

Diagnostic Imaging Systems

2325 E. Saint Charles Street

Rapid City, SD 57703

Phone: 605-341-2433

Fax: 605-341-0053

Website: www.vetxray.com

Diamond Farrier Company

361 Haven Hill Road

PO Box 1346

Shelbyville, KY 40066

Phone: 866-844-9622

Fax: 502-633-4168 or 502-633-5863

Website: www.diamondfarrierusa.com

Goldway US, Inc.

732 Smithtown Bypass, Suite 102B

Smithtown, NY 11787

Phone: 631-584-6688

Fax: 631-584-6699

Website: www.goldwayvet.com

Jorgensen Laboratories, Inc.

1450 Van Buren Ave.

Loveland, CO 80538-3683

Phone: 970-669-2500 or 800-525-5614

Fax: 970-663-5042

E-mail: info@jorvet.com

Website: www.jorvet.com

MacKinnon Products, LLC

1721 Lovall Valley Road

Sonoma, CA 95476

Phone: 707-343-1518

Websites: www.Icehorse.net, www.Hoofwraps.com,
www.Sterihoof.com, www.Tackwrap.com

Miltex, Inc.

589 Davies Drive

York, PA 17402

Phone: 717-840-9335 or 800-645-8000

Fax: 717-840-9347 or 866-854-8400

Website: www.miltex.com

Nasco

901 Janesville Ave.

PO Box 901

Fort Atkinson, WI 53538-0901

Phone: 920-563-2446 or 800-558-9595

Fax: 800-372-1236

E-mail: custserv@eNasco.com

Website: www.enasco.com

Securos Veterinary Orthopedics

443 Main Street

PO Box 950

Fiskdale, MA 01518

Phone: 877-266-3349

Fax: 508-248-7979

Website: www.securos.com

Sydell, Inc.

46935 SD Highway 50

Burbank, SD 57010

Phone: 800-842-1369

Fax: 606-624-3233

Website: <https://sydell.com>

Photo Credits

Photos of the following instruments were provided by Jorgensen Laboratories, Inc., Loveland, Colorado

Ambu Bag

Anesthesia and Oxygen Masks

Balfour Retractor

Bone Marrow Biopsy Needle

Cornell Detorsion Rod

Cornell Teat Curette

Culture Swab

Dental Cavitron with Polisher

Dental Chisel

Dental Rasp

Dental Tooth Punch

Doppler

Drinkwater Mouth Gags for Cattle

Ear Bulb Syringe

Ecraseur

Electrosurgical Generator

Endoscopes

Endotracheal Tube

Enteral Feeding Tubes

Equine Dental Halter

Equine Molar Cutter

Equine Mouth Speculum

Equine Tooth Extractors
Fecal Loop
Fecalyzers
Feeding and Dosing Needles
Fetatome
Fetotomy Knife
Finochietto
Freemartin Probe
Gas Anesthesia Machine
Groove Director
Hauptner Mouse-Ear ID Tags and Applicator
Hemocytometer
Hernia Clamp
Hoof Abscess Knife
Hoof Angle Gauge
Hoof Groover
Hoof Searcher
Infusion Pump
Inhalation Chamber
Intravenous Drip Sets (Venous Sets)
Intravenous Stand
Jones Towel Forceps
Killian Vaginal Speculum
Krey Obstetrical Hook
Lead Aprons, Gloves, and Thyroid Collars
Lichty Teat Knife or Bistoury
Magnets

Mare Uterine-Flushing Catheter
Mason Meta Splints with Extensions
Metal Film-Developing Hangers
Michel Wound Clips
Nail Scissors
Needle-Sterilizing Rack
Obstetrical Wire Guide
Orthopedic Cast Saw
Pet Piller
Pill-Counting Tray
Polansky Vaginal Speculum
Radiographic Cassette Holder
Radiographic Hoof Positioner
Rectal Prolapse Rings
Reimer Emasculator
Roaring Burr
Serra Emasculator
Simplex Intravenous Bell Sets
Spring-Mouth Speculum or Gag
Stallion Urinary Catheter
Stomach Tube
Tenotome Knife
Thomas-Schroeder Splint
Three-Way Stopcock
Tourniquet
Tracheostomy Tubes—Small Animal and Equine
Transfer Needle

Trephine (Horsley's)
Uterine Cytology Brush
Vetamatic Dose Syringe
Vulva Suture Pin
White Nail Trimmer
Whites Emasculator
Wire Twister
Wolftooth Elevator

Photos of the following instruments were provided by Miltex, Inc., York, Pennsylvania

Adson Tissue Forceps

Adson-Brown Tissue Forceps

Alligator Forceps

Allis Tissue Forceps

Babcock Intestinal Forceps

Backhaus Towel Forceps

Beaver Surgical Knife Handles

Castroviejo Needle Holders with Catch

Columbia Curette

Crile Forceps

Dental Elevators

Dressing Forceps

Eye-Dressing Forceps

Ferguson Angiotribe Forceps

Foerster Sponge-Holding Forceps

Gigli Wire Saw and Handles

Half-Curved Tissue Forceps

Halsted Mosquito Forceps

Hartman Mosquito Forceps

Incisor and Root Extracting Forceps

Incisor, Canine, and Premolar Extracting Forceps

Iris Hooks

Iris Scissors
Kelly Forceps
Knowles Bandage Scissors
Lister Bandage Scissors
Mayo Scissors
Metzenbaum Scissors
Molar Extracting Forceps
Operating Scissors
Rochester-Carmalt Forceps
Rochester-Ochsner Forceps
Rochester-Péan Forceps
Scalpel Handles
Senn Rake Retractor
Strabismus Scissors
Straight Littauer Stitch Scissors
Tonopen
Weitlaner Retractor
Wire Scissors

Photos of the following instruments were provided by Nasco, Fort Atkinson, Wisconsin

All-In-One Lamb Castrator, Docker, and Ear Marker

Animal Clippers

Antikick Bar

Artificial Vagina

Automatic Dose Syringe

Balling Gun

Barnes Dehorner

Bayer Mouth Speculums

Blow Dart

Burdizzo Emasculator

Calf, Foal, Piglet, Lamb Resuscitators

Calf Snare

Calf Weaners

California Mastitis Test Kit

Cattle Prod

Chain Shank

Clinch Cutter

Cow Boot

Cow Sling

Cribbing Strap/Cradles

Dehorning Saw

Dental Float

Dog Snare or Capture Pole
Dose Syringe
Dose Syringe Nozzle Ends
Drench Pump
Drench-Matic Dose Syringe
Ear Notcher
Elastrator
Electric Branding Irons
Electric Dehorner
Equine Mouth Speculum
Ewe Prolapse Retainer
Fabric Show Halter—Cattle
Fabric Show Halter—Sheep
Fetal Extractor (Calf Puller)
Freeze Branding Irons
Frick Speculum
Halter with Lead Rope
Heat-Mount Detector
Hip Lift
Hobbles
Hog Snare
Hoof Blocks
Hoof Knives
Hoof Parer-Pincer
Hoof Pick
Hoof Rasp
Hoof Tester

Hoof Trimmer—Sheep and Goats
Hoof-Trimming Table and Chute
Horn Gouge
Hot-Iron Branding Irons
Identification Tag Applicator
Insemination Pipettes
Keystone Dehorner (Guillotine)
Lambing Instrument
Lariat with Quick-Release Honda
Lead Rope
Long-Handled Hoof Nippers (Squire Hoof Trimmers)
Mare Uterine-Flushing Catheters
Marking Sticks
Milking Tubes
Newberry Castrating Knife
Obstetrical Chains and Handles
Obstetrical Gloves
Oral Calf Drencher
Pig Obstetrical Forceps
Pig Tooth Nipper
Pole Syringe
Restraint Gloves
Rope Halter
Sheep Crook
Sheep-Trimming Shears
Squeeze Chute
Swiss Hoof Knife

Tattoo Ink
Tattoo Letters and Digits
Tattoo Outfit—Electric
Tattoo Outfit—Manual—Small Animal and Large Animal
Teat Dilator
Teat Slitter
Teat Tumor Extractor
Thermometer—Digital
Thermometer—Manual—Small Animal and Large Animal
Trocac and Cannula
Twitch-Chain
Udder-Infusion Cannula
Udder Support
Umbilical Clamp
Umbilical Tape
Whips
White Emasculator
Wire Saw and Handles

**Photo of the following instrument was
provided by Advanced Monitors
Corporation, San Diego, California**

Aural Thermometer (Vet Temp)

Photos of the following instruments were provided by Securos Veterinary Orthopedics, Fiskdale, Massachusetts

Bone Rasp

External Fixation Kits

Intramedullary Pin Chuck

Intramedullary Pin Cutter

Intramedullary Pin Setter

Intramedullary Pins

Kern Bone-Holding Forceps with Ratchet

Lambert-Lowman Bone Clamp

Liston Bone-Cutting Forceps

Michel Laminectomy Trephine

Orthopedic Wire

Periosteal Elevator

Ruskin Rongeur

Close-up photos of the following instruments are from Nemitz: Surgical Instrumentation: An Interactive Approach, St. Louis, 2009, WB Saunders.

Adson Tissue Forceps

Adson-Brown Tissue Forceps

Alligator (Wullstein) Forceps

Castroviejo Needle Holder

Groove Director

Halsted Mosquito Forceps

Iris Scissors

Lister Bandage Scissors

Mayo Scissors

Rochester-Péan Forceps

Weitlaner Retractor

Wire Scissors (Angled)

Photo of the following instrument was provided by Washabau, RJ; Day, MJ: Canine and Feline Gastroenterology, St Louis, 2013, Saunders

Endoscope

**Photo of the following instrument was
provided by Sellon, DC; Long, MT:
Equine Infectious Diseases, St Louis,
2007, Saunders**

Uterine Cytology Brush

Photo of the following instrument was provided by Brown, M; Brown, LC: Lavin's Radiography for Veterinary Technicians, ed 5, St Louis, 2014, Saunders

Hoof-Angle Gauge

**Photos of the following instruments
were provided by Diamond Farrier Co.
Shelbyville, Kentucky**

Combination Shoe Puller and Spreader

Crease Nail Puller

**Photos of the following instruments
were provided by MacKinnon
Products, LLC, Sonoma, California**

- Hoof Ice Boot—Horse Therapy Boot

Photo of the following piece of equipment was provided by Sydell Inc. (www.sydell.com)

- Sheep/Goat Chute—Deluxe Spin Doctor

Photos of the following pieces of equipment were provided by Diagnostic Imaging Systems, Rapid City, South Dakota

- Ultra 12030HF Portable Radiography Unit
- Versa View Table
- Ultrasound—Wireless and Portable

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