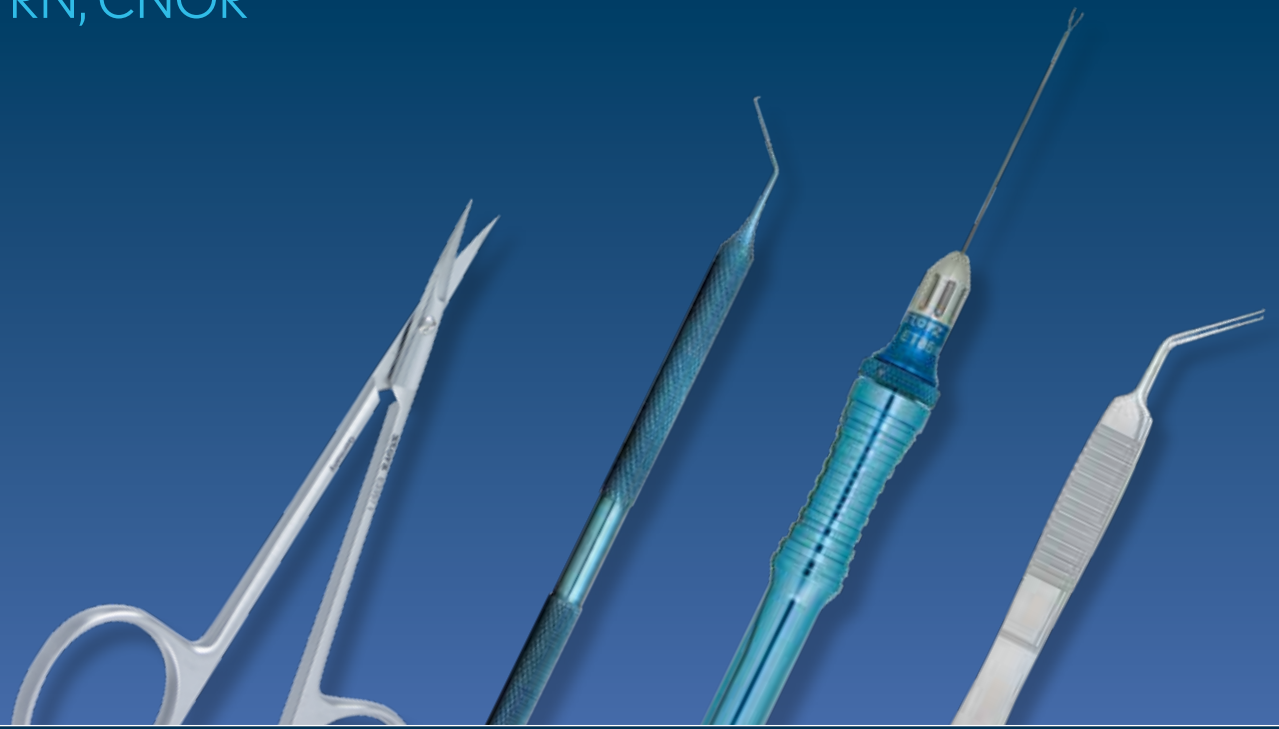
Utilization of Ophthalmic Surgical Instruments

Terri Goodman, PhD, RN, CNOR



Developed with an unrestricted educational grant from

storz®
Ophthalmic Instruments

Utilization of Ophthalmic Surgical Instruments

Disclosures

Requirements for Successful Completion

- View the activity in its entirety
- Complete the Evaluation Form
- Achieve at least the minimum score on the Post-Test

Conflict of Interest

The authors have no conflict of interest to declare. The activity has been reviewed to ensure that content meets the requirement for continuing nursing education. One author is the owner of Terri Goodman & Associates, the approved provider of continuing nursing education.

Commercial Support

This presentation was developed with an unrestricted educational grant from Bausch + Lomb Storz® Ophthalmic Instruments.

Disclosures

- This Continuing Education program has been granted 2.0 contact hours for nurses with a minimum score of 80 on the post test. Contact hours expire on December 31, 2026.
  Terri Goodman & Associates, Provider Number CEP16550, is a CE provider approved by the California Board of Registered Nursing.
- This Continuing Education program has been granted Continuing Education credits from the Certification Board for Sterile Processing & Distribution, Inc. (CBSPD) for 2.0 contact hours with a minimum score of 70 on the Post-Test.
- This Continuing Education program has been granted Continuing Education credits from the Healthcare Sterile Processing Association for 1.0 contact hours with a minimum score of 70 on the Post-Test.

Objectives

1. Describe at least four approaches to naming surgical instruments
2. Identify four categories of ophthalmic instruments
3. Discuss characteristics that differentiate instruments of the same type
4. Explain the characteristics of different materials for surgical instruments

Nomenclature

1. Surgical instruments are often named for the surgeon who designed the instrument, or the hospital where it was designed

2. The instrument name may identify the purpose of the instrument or the specific area of the eye where it is used

Instrument Categories

Eye instruments are organized into groups that describe the purpose for which they are used

- Retracting
- Grasping
- Cutting
- Miscellaneous

Retractors

Specula | Retractors | Hooks

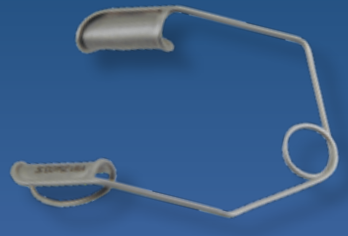
- Retractors are designed to retract or hold open various tissues or incisions during eye surgery
- Retractors vary in design and size
- Retractors are selected according to the object or tissue on which they will be used

Specula

- An eye speculum is used to spread the eyelids and holds them open during various eye procedures
- There are many designs available
- Specula come in various arm styles including adjustable, locking, and wire

Nichamin Locking Lid Speculum

Murdoch Eye Speculum



Paly 1/2 n 1/2 Eye Speculum

Specula

Solid Blades

- Solid blades keep lids covered and prevent lashes from entering the operative field
- May obstruct instruments during the procedure

Lieberman Speculum Angled

Wire Blades

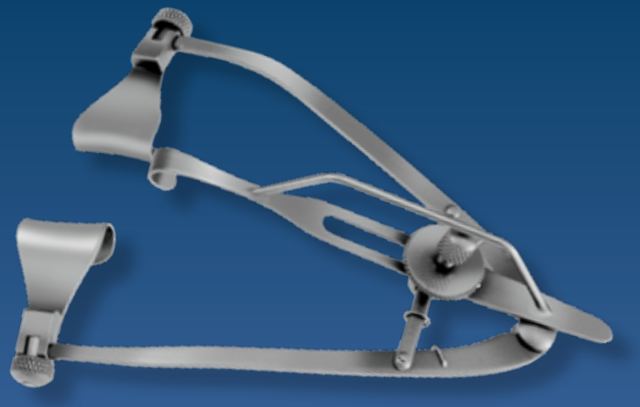
- Reduce bulk around lids
- Are lighter in weight and offer increased exposure

Lehner Temporal Speculum

Specula

Fenestrated Blades

- Provide rigid retraction while reducing bulk around the cornea



Maumenee-Park Speculum

Retractors

Iris Retractors

- Iris retractors are used to retract the iris during cataract extraction
- Some offer the advantage of irrigating and retracting simultaneously

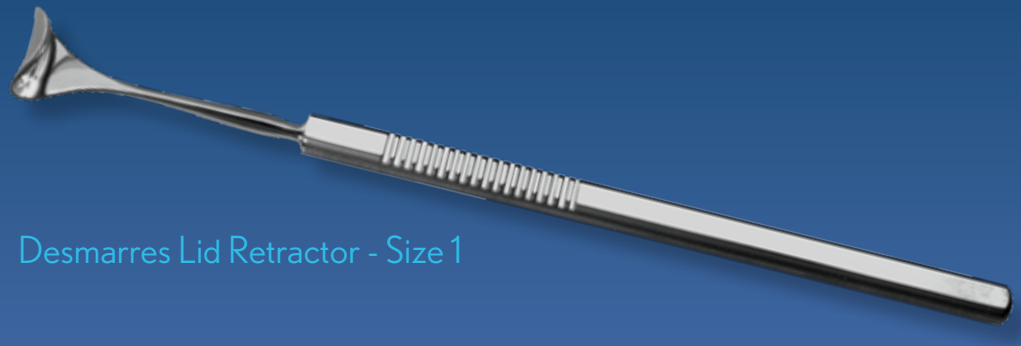
MADLAB Iris Retractor

Graether Collar Button - on Handle

Retractors

Lid Retractors

- Lid retractors are used to hold the eyelid open during surgeries, exams, suturing procedures, etc.



Desmarres Lid Retractor - Size 1

Jaffe Lid Retractor

Retractors

Lachrymal Sac Retractors

- This retractor is used to retract the incision during lachrymal surgery
- While similar to a speculum, it retracts a wound rather than the eyelids

Stevenson Lacrimal Sac Retractor

Retractors

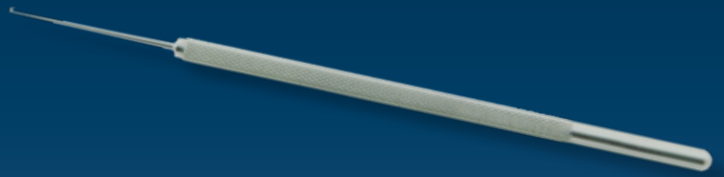
Orbital Retractors

- Orbital retractors are used to retract the globe during orbital surgery
- The slot provides control of the globe and can be used to span the optic nerve

Schepens Orbital Retractor

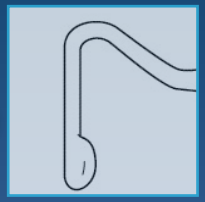
Hooks

- Hooks are used to push and pull and/or manipulate various structures (iris, capsule, muscle, etc.)
- Hooks are placed on cannula hubs or handles
- Some hooks have both irrigating and aspirating capabilities, in addition to the "hooking" function

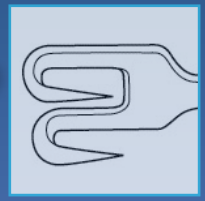


Weir Push/Pull Manipulator

Jameson Muscle Hook



Double Fixation Hook



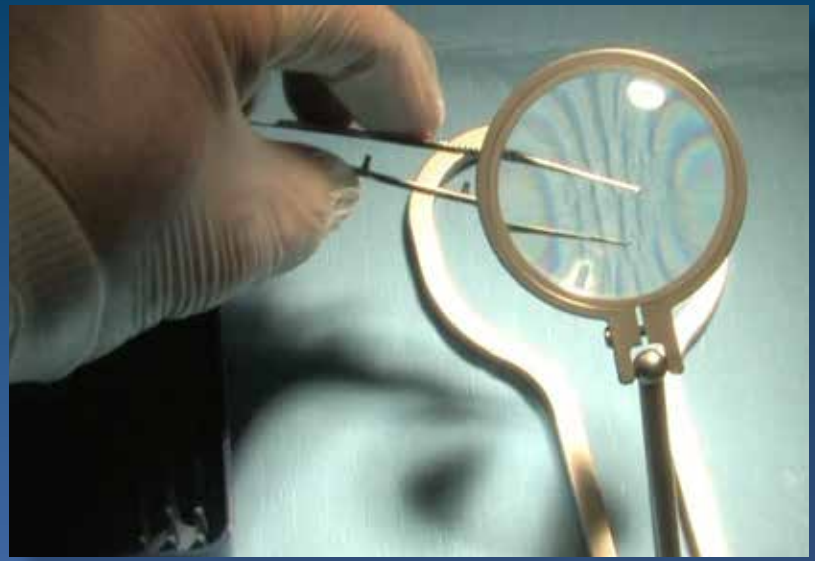
Grasping Instruments

Forceps | Needle Holders

- Grasping instruments hold tissue or equipment such as suture needles
- Instrument design is dependent upon the type of tissue or object held

Forceps

- The function of forceps is to grasp an object or tissue
- Forceps are selected according to the object or tissue on which they will be used
- Many types of forceps have been designed for use in and around the eye
- The forcep is considered an extension of the surgeon's finger tips



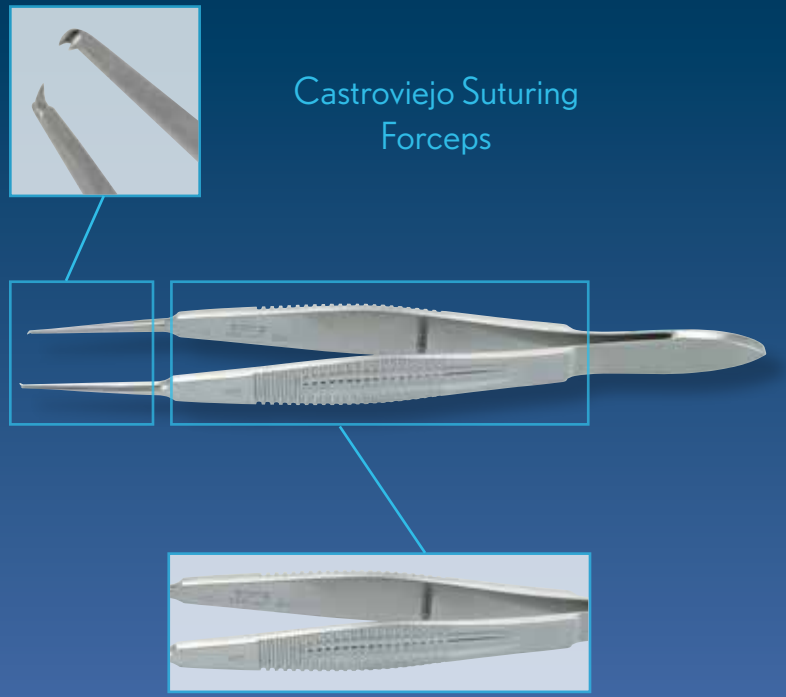
Forceps

Working End

- Distinction between forceps can best be made by inspecting the working end (tips) of the forceps

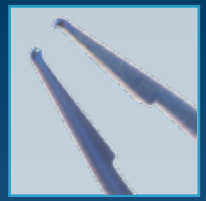
Handle

- Forceps handles vary in design and size



Forceps Tips

Toothed Tip



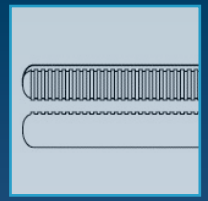
Castroviejo Suturing Forceps

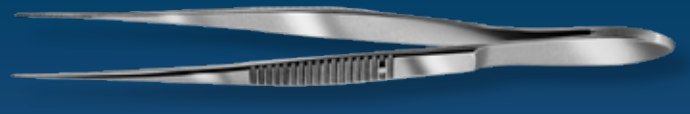
Tying/Platform Tip

Bechert-McPherson Angled Tying Forceps

Forceps Tips

Serrated Tip





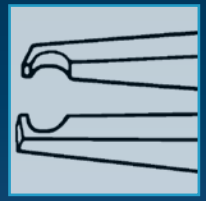
Straight Dressing Forceps with Serrations

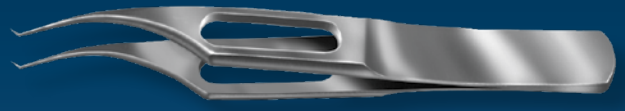
Capsulorhexis Tip

Utrata Capsulorhexis Forceps Sharp Tips

Forceps Tips

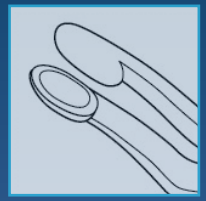
Beaked Tip

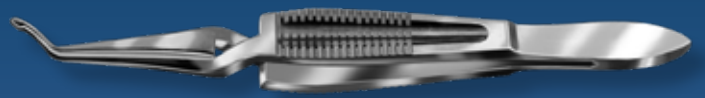




Pierse Colibri Forceps Micro

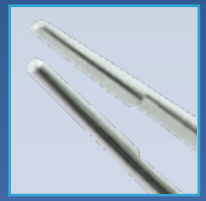
Cupped Tip





Castroviejo Curved Capsule Forceps

Smooth Tip



Osher Capsule-Foreign Body Forceps

Forceps Tips

Toothed

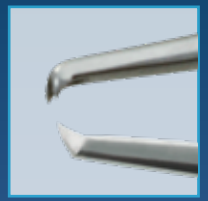
- Forceps with teeth are used to pick up or fixate tissue
- These forceps may be designed with a single tooth on either shaft or numerous teeth which meet or intermesh, set at various angles
- The teeth will vary in size according to the tissue they will be fixating
- These forceps are usually identified by size in millimeters, 0.12 mm, 0.3 mm, 0.5 mm, or the number of teeth and intermesh such as 1x2, 2x3, etc.

Forceps Tips

Toothed

- Size in millimeters

Castroviejo Suturing Forceps 0.12 mm



Castroviejo Suturing Forceps 0.3 mm

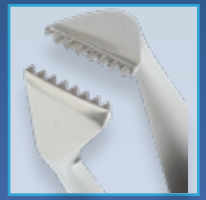
Castroviejo Suturing Forceps 0.5 mm

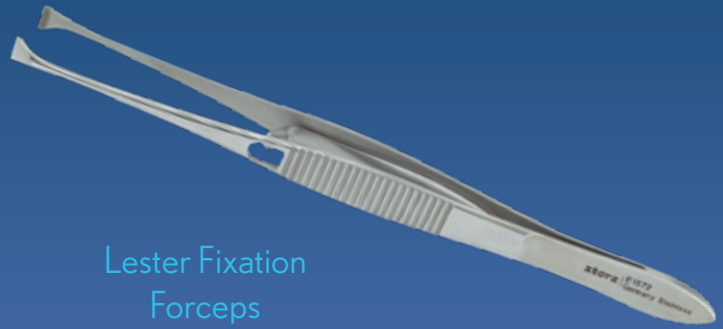
Forceps Tips

Toothed

- Number of intermeshing teeth
- Comes in various sizes

Castroviejo Suturing Forceps 0.12 mm



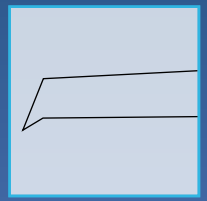


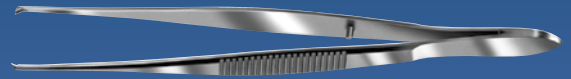
Lester Fixation Forceps

Forceps Tips

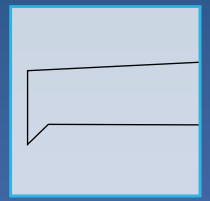
Toothed - Angles

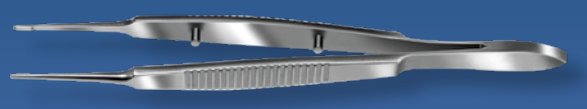
- The types of teeth used and the angles at which they are set may also vary according to their intended use. For example, a fixation forceps may feature intermeshing teeth set at 30-40° angles
- Other forceps have intermeshing teeth set at a right angle to the shaft





Elschnig Fixation Forceps





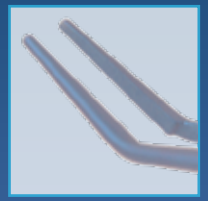
Thorpe Conjunctiva Fixation Forceps
(Set @ 90° Angle)

Forceps Tips

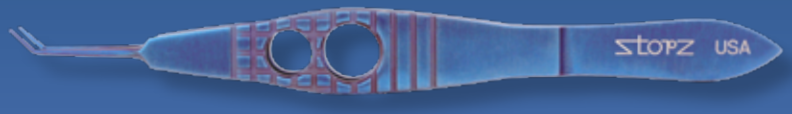
Tying/Platform

- Features platforms used for tying, usually with very fine tips and shanks
- The platform is designed to grip very fine sutures and allow the physician to maneuver easily
- For best functionality the platforms should be light-tight

Bechert-McPherson Tying Forceps Angled



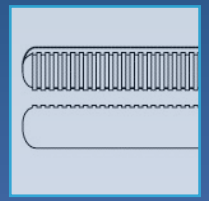
McPherson Tying Forceps Angled

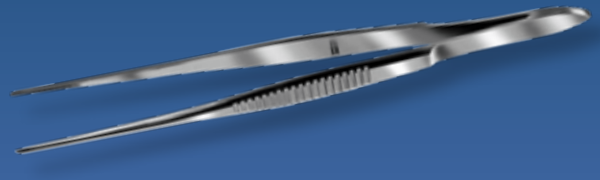


Forceps Tips

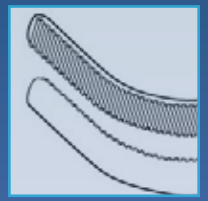
Serrated

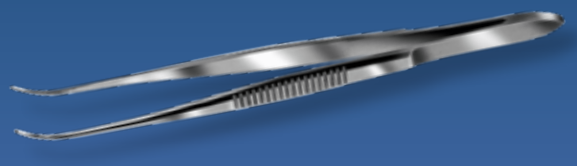
- Serrated tips are most common on dressing forceps but may also be found on iris, cilia, utility or tying forceps
- The serrations provide a good grip on sutures, cilia, iris or other objects





Straight Dressing Forceps with Serrations



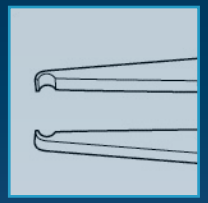


Curved Dressing Forceps with Serrations

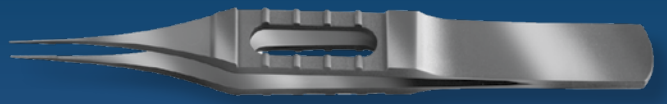
Forceps Tips

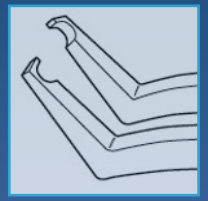
Beaked (Open Cup) Forceps

- Found on Pierse type forceps and designed to fixate structural but moldable tissues such as the cornea and sclera
- The tissue is held by being molded into the cup between opposing tip surfaces, much as hands might grasp a soft balloon
- This design produces less tissue trauma than toothed forceps

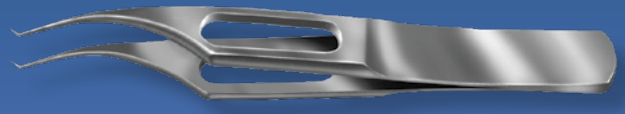


Pierse Forceps
Straight





Pierse Colibri Forceps
Micro



Forceps Tips

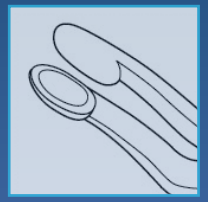
Cupped

- Cupped tips may be found on fixation and iris forceps, but are most common on capsule forceps
- They provide atraumatic but secure tissue handling when used on fixation forceps
- They provide a firm grip on the iris from any direction, without tearing the delicate tissue

Forceps Tips

Cupped

- The cupped tips of a capsule forceps are designed to provide a firm grip on the lens capsule

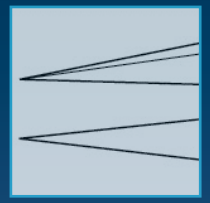


Castroviejo Curved Capsule Forceps

Forceps Tips

Smooth

- Smooth tip forceps are most common on tying, utility, cilia and jewelers forceps
- Jaws must meet accurately to provide a good grip on sutures, cilia or tissue



Jeweler Type Forceps

Cilia Forceps - Narrow

Forceps Handles

Forceps Handles

- Forceps handles vary in design and size
- It is not uncommon to find identical tips on three or four different handle styles, each designed for the same purpose
- Most forceps have a spring action handle to ensure that all working ends return to the open position when not in use

Forceps Handles

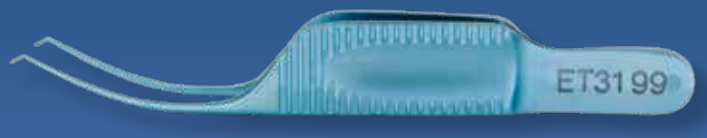
Castroviejo

- Wide with a heavy, grooved serration

Castroviejo Suturing Forceps
0.12 mm

Colibri

- Has a deep swale to provide greater visualization at the tip
- Characterized by its small, delicate size and shape



Colibri Forceps 0.12 mm

Forceps Handles

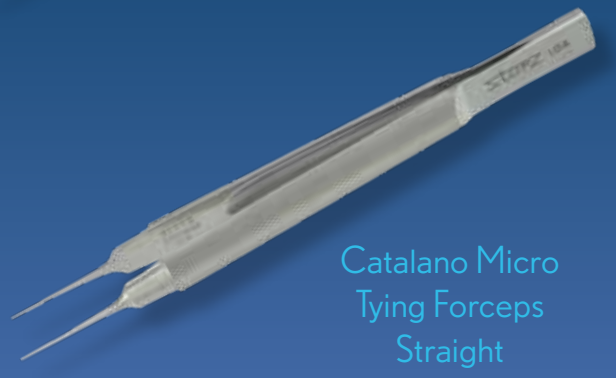
Cross-Action

- Crosses itself and works with a scissors-like action

Round Handle

- Can be rolled in the fingertips when closed, to improve control of the forceps tips

Akahoshi Prechop Forceps Straight



Catalano Micro Tying Forceps Straight

Forceps Handles

Squeeze Handle

- Incorporates a squeeze action, to control the grasping function at the tip
- The squeeze handle is utilized in instrumentation such as Intraocular or Posterior Segment forceps

25 Gauge StableGrip®
ILM Forceps

Forceps Handles

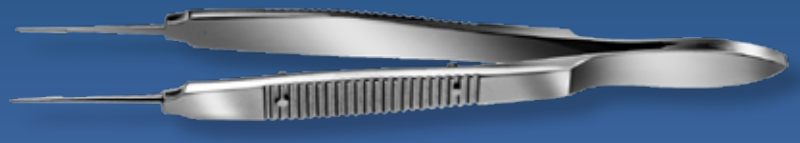
McPherson

- Narrow, flat handles with serrations
- Characterized by its short length – usually about 3" (85mm) overall

Kelman-McPherson Tying Forceps Angled

Harms-Tubingen

- Moderate-width, flat handles with serrations
- Length approximately the same as the Castroviejo handle

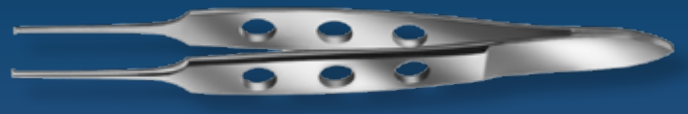


Harms-Tubingen Straight Tying Forceps

Forceps Handles

Smooth w/Holes

- Usually found on Bishop-Harmon forceps
- Has a smooth finish, with holes to provide fingertip control



Bishop-Harmon Straight Tissue Forceps

Forceps

Forceps are often categorized according to their intended use

- Capsulorhexis
- Chalazion Forceps
- Cilia Forceps
- Corneal Forceps
- Dressing and Tissue Forceps
- Fixation Forceps
- Intraocular Lens (IOL) Forceps
- Iris Forceps
- Jewelers Forceps
- Muscle Forceps
- Suturing Forceps
- Tying Forceps
- Utility Forceps
- Vitreoretinal Forceps

Forceps

Capsulorhexis Forceps

- The tips are sharp to puncture the capsule during capsulorhexis
- The inner surfaces or "hexis" of the forceps tips are textured to facilitate grasping of the delicate capsule tissue

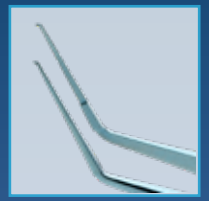
Utrata MICS
Capsulorhexis Forceps

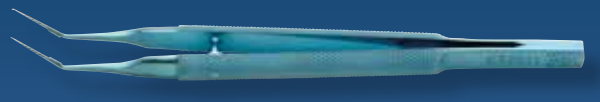
Devgan Micro
Capsulorhexis Forceps

Forceps

Capsulorhexis Forceps

- A capsulorhexis is the making of a continuous circular tear in the anterior capsule during cataract surgery in order to allow expression of the nucleus of the lens





Grayson Lehner
Capsulorhexis Forceps

Forceps

Chalazion Forceps

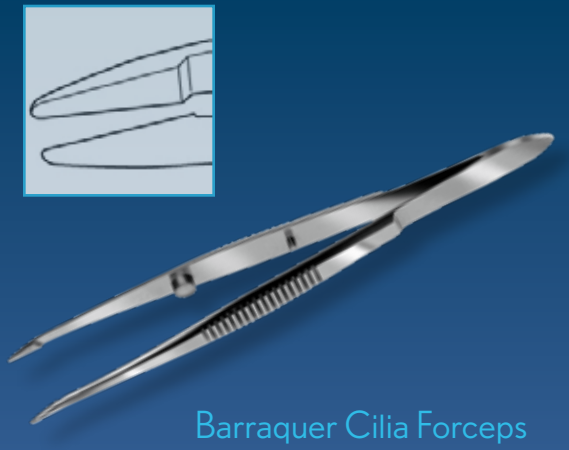
- This forceps (or "clamp") is designed to grasp and evert the eyelid while a chalazion is curetted
- This forceps is available in many sizes and shapes according to the size of the chalazion and its location on the eyelid

Demarres Chalazion Forceps - 24mm

Forceps

Cilia Forceps

- Cilia forceps are used to grasp and remove ingrown cilia (eyelashes)
- It is imperative that the jaws of this instrument meet accurately and grasp the lash tightly
- Some ophthalmologists use a very fine needle holder or jewelers forceps for this purpose



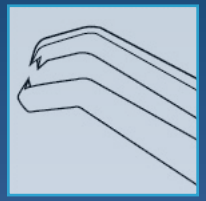
Barraquer Cilia Forceps

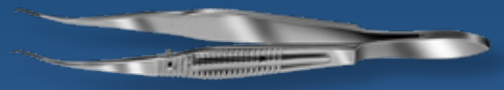
Forceps

Corneal Forceps

- Designed to grasp cornea
- Corneal forceps normally have very small teeth (no larger than .12mm)

Colibri Forceps



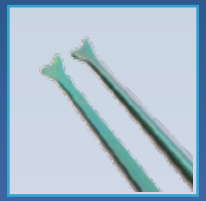


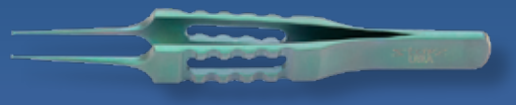
Corneal Forceps Colibri Style

Forceps

Corneal Forceps

- Some corneal forceps are specially designed for corneal transplant procedures, including:
  Descemets Stripping Endothelial Keratoplasty (DSEK),
  Descemet's Membrane Endothelial Keratoplasty (DMEK),
  Deep Anterior Lamellar
  Keratoplasty (DALK)
  and Penetrating Keratoplasty



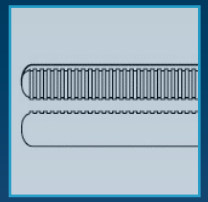


John DMEK Lifting Forceps

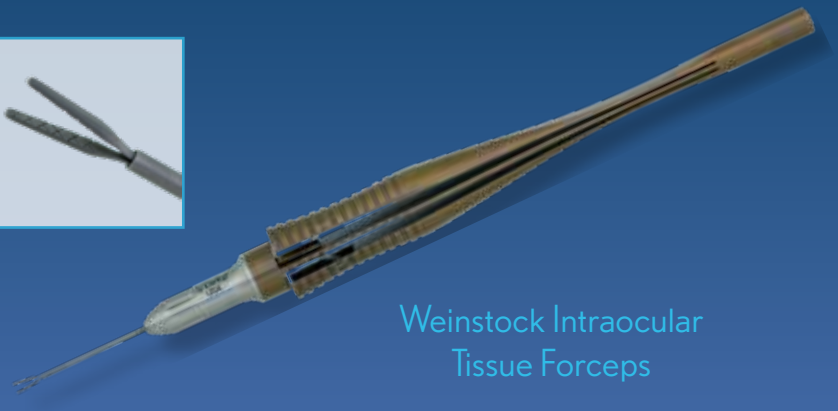
Forceps

Dressing and Tissue Forceps

- Dressing forceps are designed to pick up eye dressings, sponges, etc.
- Dressing forceps usually have serrations
- A tissue forceps usually has teeth



Straight Dressing Forceps
With Serrations



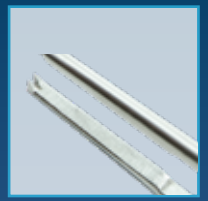
Weinstock Intraocular
Tissue Forceps

Forceps

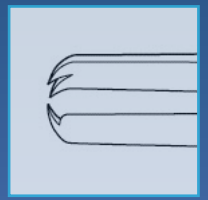
Fixation Forceps

- Fixation forceps are used to fixate, hold or pick up various tissues in the eye
- Most have teeth or serrations
- The design of the tips will vary according to the tissue on which it will be used

Osher Conjunctiva Fixation Forceps



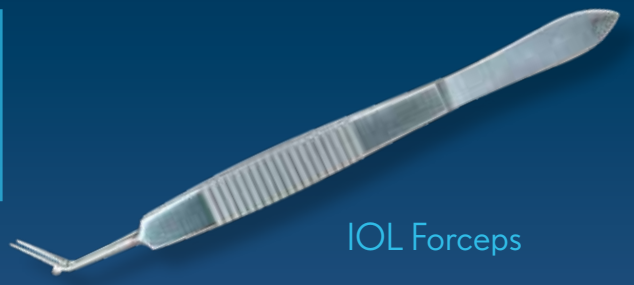
Castroviejo Fixation Forceps



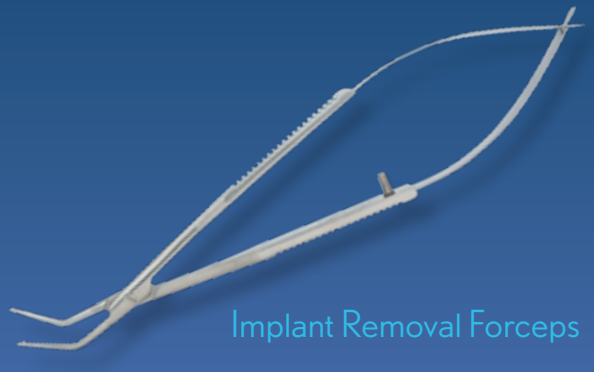
Forceps

Intraocular Lens (IOL) Forceps

- Designed to grasp, insert or remove the intraocular lens from the eye
- Tips vary in design to match lens styles



IOL Forceps

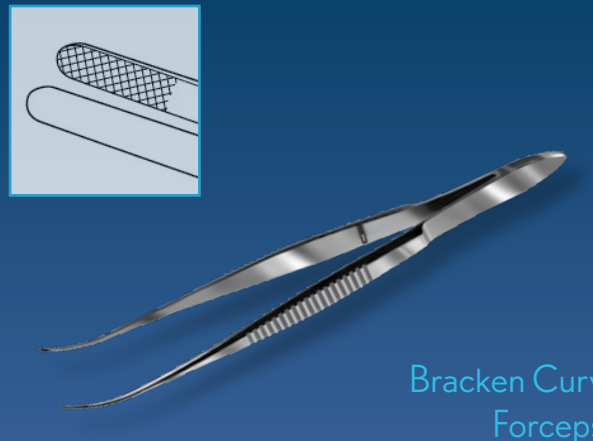


Implant Removal Forceps

Forceps

Iris Forceps

- Iris forceps are designed to pick up and hold the iris while performing an iridectomy
- Some have fine serrations for grasping without causing tissue trauma

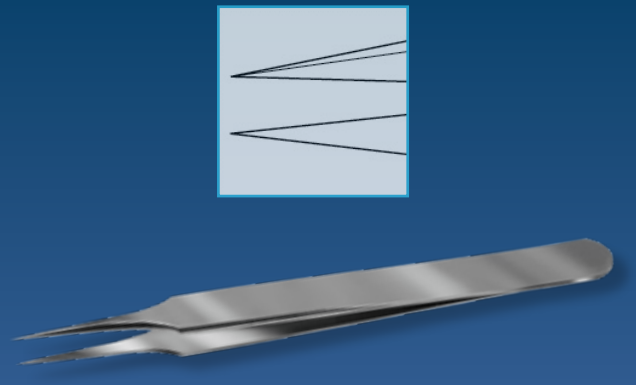


Bracken Curved Iris Forceps

Forceps

Jewelers Forceps

- Originally designed for use by jewelers for watch and jewelry repair, they also provide the ophthalmologist an excellent instrument for suture removal, cilia removal, or as tying forceps
- These forceps have very fine pointed tips which enables them to grasp extremely small objects



Jeweler Type Forceps
Extra Fine

Forceps

Muscle Forceps

- Muscle forceps are used to hold the muscle during strabismus surgery
- Most have teeth for a firm grip
- Muscle forceps must have a lock to free the surgeon's hands

Putterman Mullers Muscle
Conjunctiva Resection
Ptosis Clamp

Forceps

Suturing Forceps

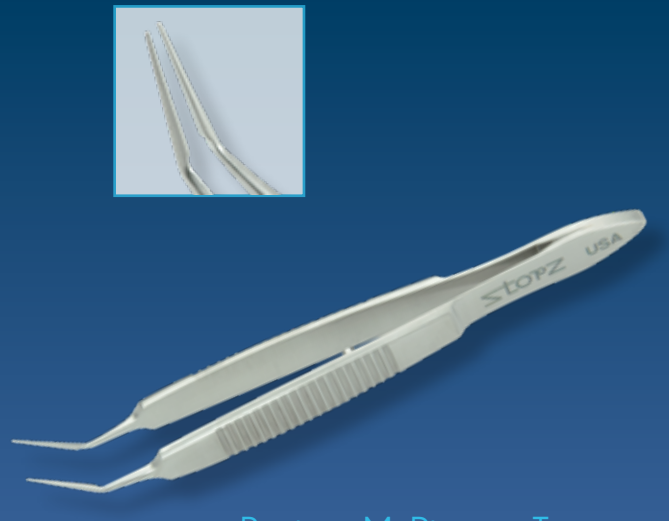
- Suturing forceps are used for both holding tissue in place (fixating) and tying
- They have a tying platform with teeth in a 1x2 pattern at the very end of the platform
  - The teeth hold tissue while placing sutures
  - The platform may be used to pick up or tie sutures

Castroviejo
Suturing Forceps

Forceps

Tying Forceps

- These forceps are similar to suturing forceps
- They have the same tying platforms but do not have teeth
- Their only purpose is to tie sutures



Bechert-McPherson Tying Forceps Angled

Forceps

Utility Forceps

- Most utility forceps have serrated or smooth tips and have many uses

Nugent Utility Forceps - Smooth

Forceps

Vitreoretinal Forceps

- Used in posterior surgery to grasp and peel tissue
- Several types of forceps are available with a squeeze-action mechanism to close the tips

25 Gauge StableGrip® ILM Forceps

Needle Holders

- Needle holders are designed to hold the needle firmly and allow ease of manipulation without blunting the tip or edge of the needle
- There are various designs of needle holders selected according to the surgeon's preference

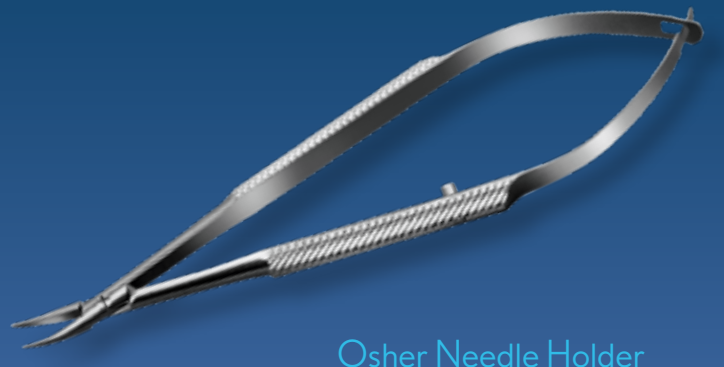
Needle Holders

Handles

The handle design is selected according to the surgeon's preference

Round Handles

- The rounded pattern allows the user to roll the needle holder when placing sutures



Osher Needle Holder
Curved without lock

Needle Holders

Flat Handles

- The flat handle does not provide as much freedom of movement but allows a firmer grip

Castroviejo Needle Holder - Curved with Lock

Needle Holders

Ring Handles

Derf Needle Holder

Needle Holders

Locks

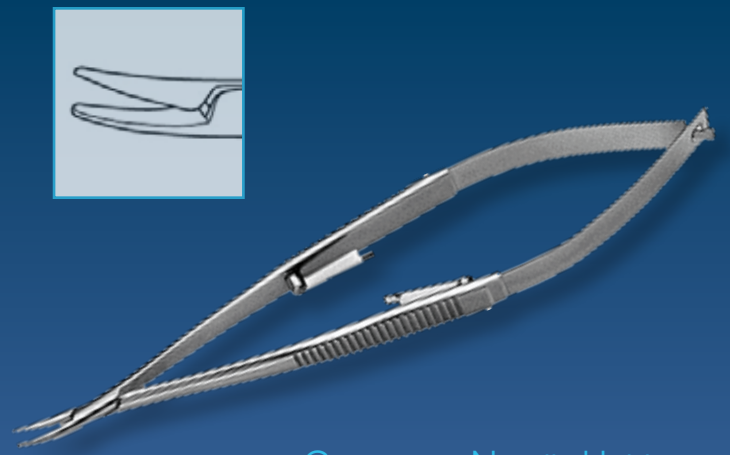
- Needle holders that do not lock require constant digital pressure to hold the needle in place
- A locking needle holder allows the surgeon to relax his grip while passing the needle through tissue
- A slight pressure is used to close or release the lock mechanism smoothly

Castroviejo Needle Holder - Straight Locking

Needle Holders

Jaws

- Curved or straight jaws are chosen by surgeons depending on personal preference

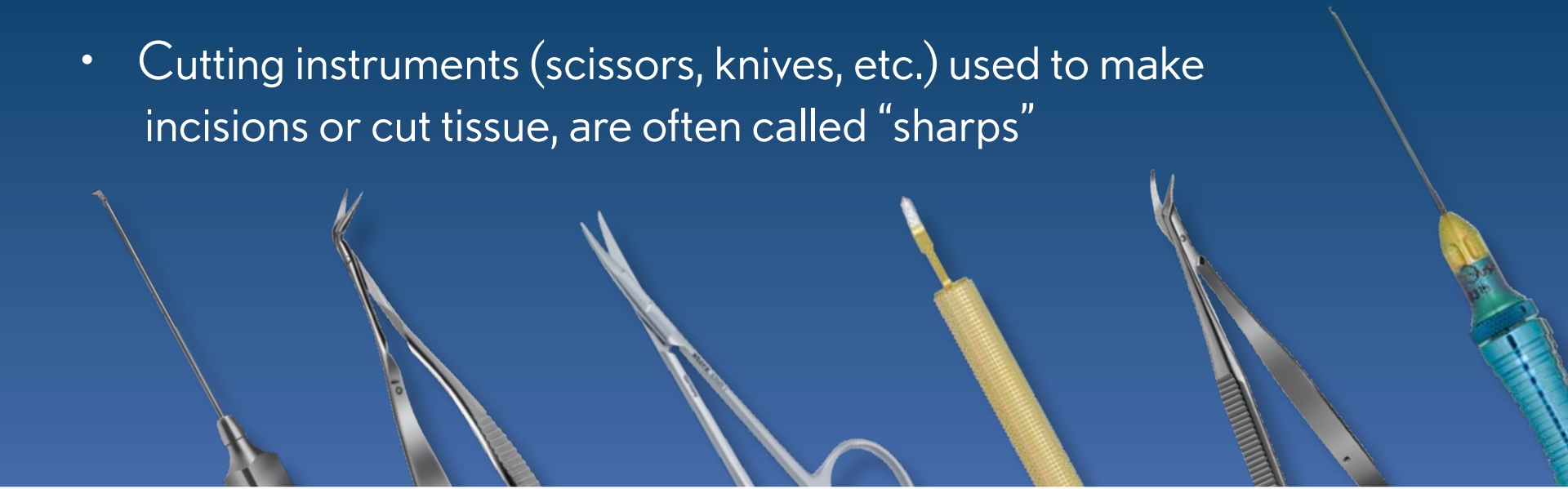


Castroviejo Needle Holder
Curved Locking

Cutting Instruments / Sharps

Scissors | Keratomes | Cystotomes | Dissectors
Blades | Diamond Knives

- Cutting instruments (scissors, knives, etc.) used to make incisions or cut tissue, are often called “sharps”



Scissors

- The blade is the most important part of the scissors
- The tissue or object to be cut with the scissors determines the type/design of the blade
- There are numerous sizes, shapes, and curvatures of blades
- The handles of the scissors vary according to procedures and preferences

Scissor Handles

There are four basic handle designs used on eye scissors

- Spring Handle
- Ring Handle
- Tab Handle
- Squeeze Handle

Scissor Handles

Spring Handle

Vannas Capsulotomy Scissors - Curved Blunt tips

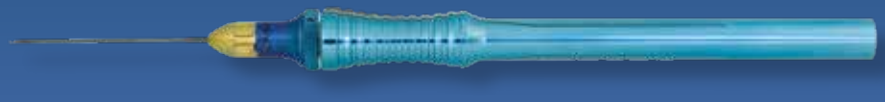
Tab Handle

Barraquer Iris Scissors

Ring Handle

Iris Scissors Pointed Curved

Squeeze Handle



25 Gauge StableGrip® Vertical Scissors

Scissors

Function

- Scissors selection is based on the object or tissue for which they will be used
- As is true with all instruments, some physicians will find that scissors designed for one purpose work equally well in another area

  Example: A doctor may use a Wescott Tenotomy Scissors as a suture scissors and will most likely call them "suture scissors" when asking for them

Scissors

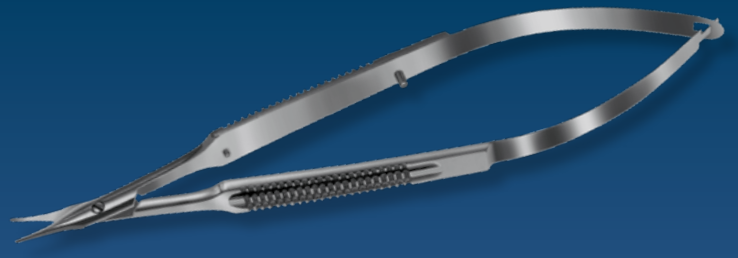
There are many scissor types:

- Conjunctiva
- Corneal (Keratoplasy)
- Corneal Section
- Enucleation
- Iris
- Stitch
- Strabismus
- Suture
- Tenotomy
- Utility
- Vannas (Capsulotomy)
- Vitreoretinal

Scissors

Conjunctiva Scissors

- Used to cut the conjunctiva prior to making an incision in the eye



Westcott Conjunctiva Scissors

Scissors

Corneal Scissors (Keratoplasty)

- Used for completing trephine cuts during corneal transplant
- Many models of corneal scissors are available
- Most are available in left or right curved scissors. This enables the doctor to cut 180° in both directions from the 12 o'clock position
- The blades may have sharp or blunt tips, or one sharp and one blunt tip
    - The advantage of at least one blunt tip (lower blade) is to avoid trauma to the endothelium, iris, or lens capsule

Scissors

Corneal Scissors (Keratoplasty)

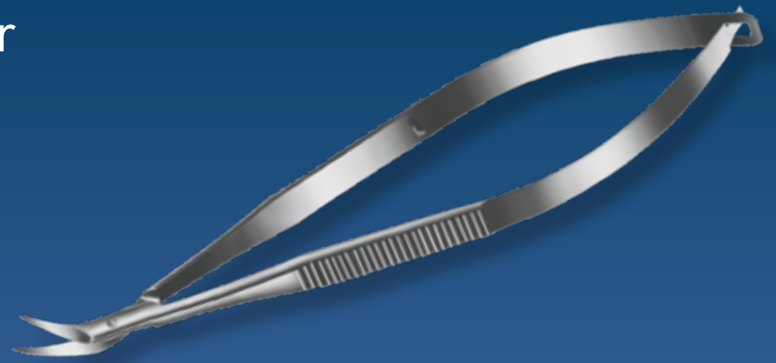
- Many corneal scissors will feature a larger lower blade often rounded in the fashion of a spatula
- The longer blade will not remove itself from the incision at the completion of each closure thereby eliminating the necessity of re-introducing the blade

Castroviejo Curved
Corneal Scissors Right

Scissors

Corneal Section Scissors

- Similar to corneal scissors with wider curvature to cut along the limbus
- This scissors is used to open the anterior chamber for various surgeries



Castroviejo Corneal Section Scissors

Scissors

Enucleation Scissors

- Used to sever the optic nerve when removing or enucleating the globe
- Strong curve to reach behind the globe

Curved Enucleation Scissors

Scissors

Iris Scissors

- Used to cut the iris when performing an iridectomy or iridotomy
- Iris scissors are also designed with both ring and spring handles

Curved Iris Scissors

Curved Iris Scissors

Scissors

Stitch Scissors

- Used both during the suturing procedures as a suture scissors or when removing sutures
- The popular spring handle or conventional ring handle scissors may be used
- Stitch scissors have very sharp points to slip under sutures during cutting and removal

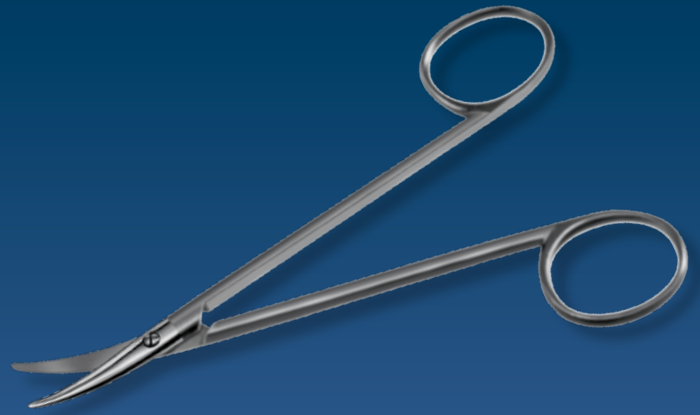
Westcott Type Stitch Scissors

Original Stitch Scissors

Scissors

Strabismus Scissors

- Used to cut muscle in a muscle recession or resection



Knapp Curved Strabismus Scissors

Scissors

Suture Scissors

- Used to cut the ends of sutures after closing and tying the wound
- Designed with an outward curve to conform to the globe of the eye

Stitch Scissors Curved

Scissors

Tenotomy Scissors

- Used in muscle surgery to make the initial incision through the conjunctiva and to cut a hole in the Tenons capsule to allow access to the muscle
- The tenotomy scissors may also be used to cut the muscle

Stevens Curved
Tenotomy Scissors

Scissors

Utility Scissors

- Used for many functions, and may have blunt or sharp tips

Curved Utility Scissors

Scissors

Vannas (Capsulotomy) Scissors

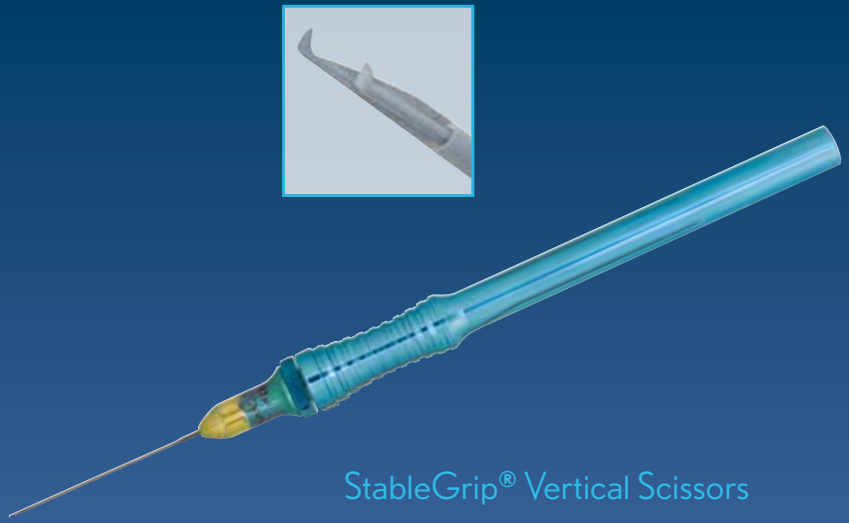
- Designed to incise the lens capsule during an extracapsular extraction
- Also used for iridectomy
- Very fine blades reach through a corneal incision to function in the anterior chamber

Gills-Welsh Angled Vannas Micro Scissors

Scissors

Vitreoretinal Scissors

- Used to cut firm intra vitreal sheets and membranes and to divide bridges of epiretinal tissue that cannot be safely cut with the vitrectomy instrument



StableGrip® Vertical Scissors

Keratomes

- The keratome is also used to enter the anterior chamber in cataract surgery

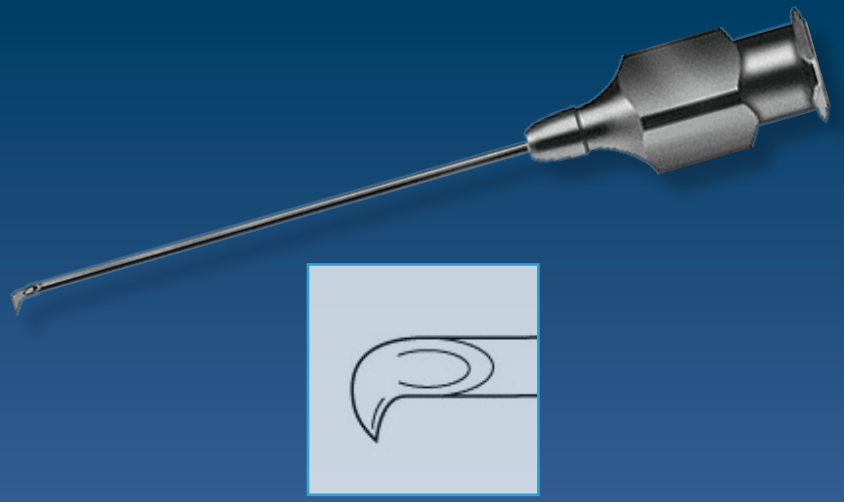
LASEREDGE® Knife

Keratomes

- The keratome is inserted into anterior chamber at the limbus
- A very narrow bladed keratome may be used to make a very small opening into the anterior chamber for obtaining cultures, performing paracentesis, repairing synechiae, etc.
- A 3.0 mm keratome or smaller is often used to enter the anterior chamber for a phacoemulsification lens extraction

Cystotomes

- Cystotomes are used to tear the anterior lens capsule when performing an extra-capsular extraction
- These very tiny sharps feature a hooked tip which both cuts and tears the lens capsule

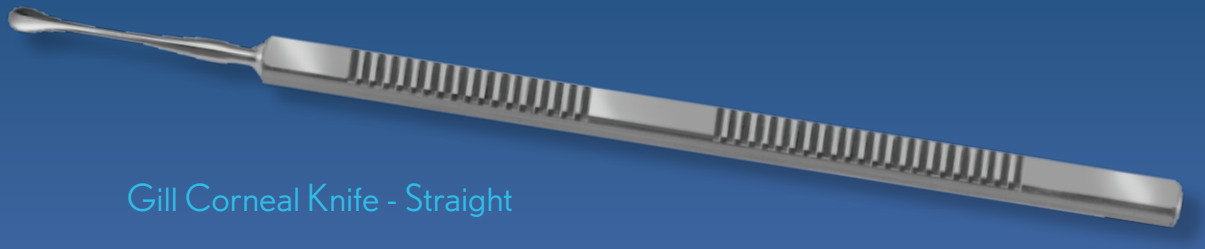


Kelman Cystotome Knife - Sharp

Dissectors

Corneal Dissectors

- Used in lamellar keratoplasty to dissect the diseased or opaque layers of the cornea from the recipient eye so it can be replaced by a transparent donor graft

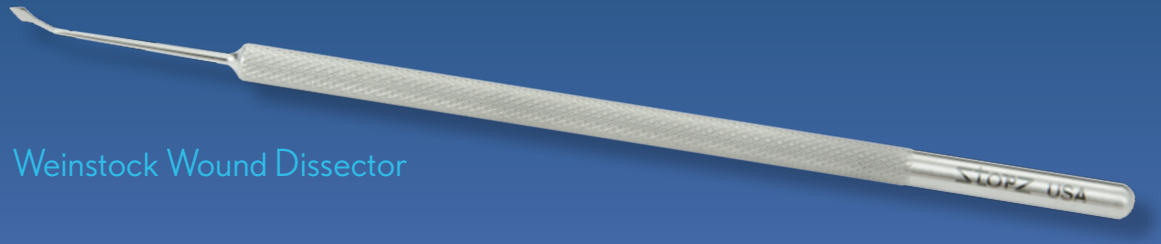


Gill Corneal Knife - Straight

Dissectors

Wound Dissectors

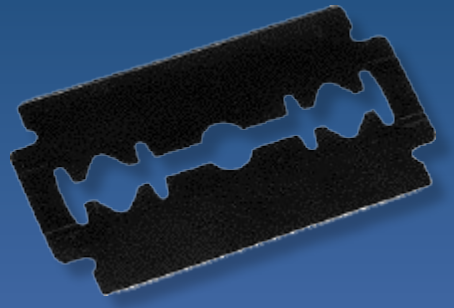
- Used in femtosecond cataract procedures to open up incisions made with the laser
- Edges are specifically designed to open up laser incisions without cutting to change the wound architecture



Weinstock Wound Dissector

Blades

- Small, pre-broken stainless or carbide blade fragments are available for use in a blade holder
- Although broken blade fragments represent best practice, many physicians prefer to use a blade breakerholder (see Blade Breaker) to break a double-edged blade into small pieces

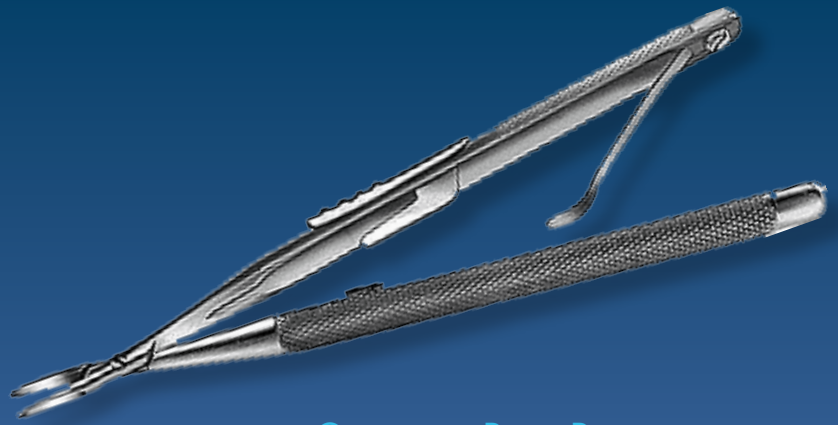


Stainless Steel
Breakable Blades

Blades

Blade Holders/Blade Breakers

- This instrument is used to break and hold razor blade fragments for various eye procedures
- A small triangular piece of a razor blade is broken from a double edged blade and used in place of a knife



Castroviejo Blade Breaker and Holder

Diamond Knives

- The diamond knife is designed to make precision atraumatic cuts
- The diamond knife has the sharpest cutting edge possible
- Expertly honed diamonds virtually eliminate problems with stainless steel blades; no resistance to cutting and no "downward dimple" from excessive pressure. The result – more precise wound approximation and lower postoperative astigmatism

Diamond Knives

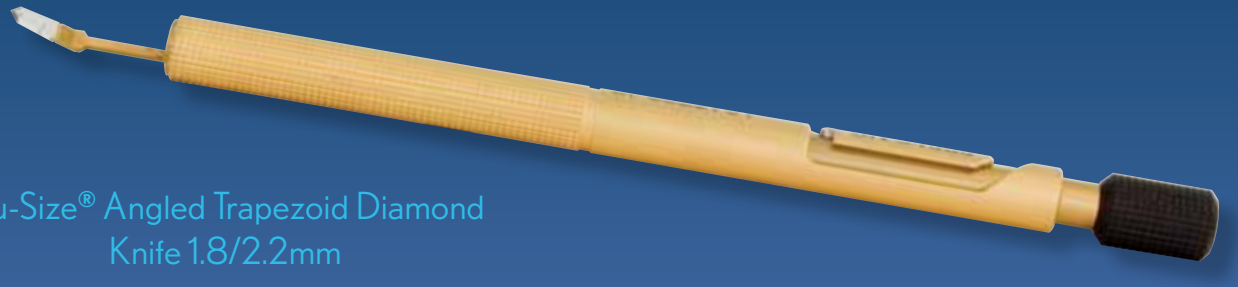
45° Angle – Single Edge Blade

- Used in cataract surgery to make the limbal incision, corneal transplants to complete the corneal graft, trabeculectomy to cut flap, for dissecting scar tissue, for making stab incisions at pterygiums
- Used in corneal refractive surgery for incisions from the optical zone to limbus

Diamond Knives

Asymmetric Blade

- Ensures a straight tunnel through the cornea



Tru-Size® Angled Trapezoid Diamond Knife 1.8/2.2mm

Miscellaneous

Instruments for Specialty Procedures (Femtosecond, Limbal Relaxing Incisions, DMEK)

Trephines | **Trephine Blocks & Punches** | **Choppers & Manipulators**

Irrigating/Aspirating Handpieces | **Markers** | **Cannulas**

Cannula Needles | **Curettes** | **Dilators** | **Enucleation Snares**

Enucleation Spoons | **Probes** | **Evisceration Spoons**

Flieringa Rings | **Foreign Body Spuds** | **Lens Loops**

Corneal Rust Ring Removers | **Scrapers/Polishers** | **Spatulas**

Iris Spatulas | **Cyclodialysis Spatulas** | **Calipers**

Depressors | **Tonometers**

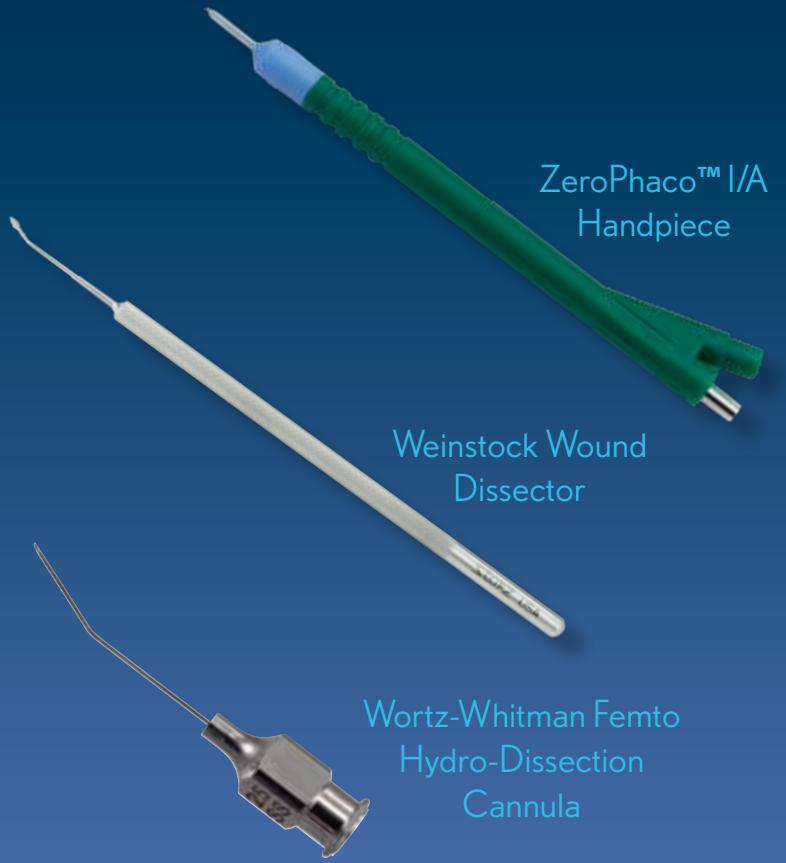
There is an instrument designed for every unique step in a surgical procedure

Instruments for Specialty Procedures

- As specialized procedures evolve, instrumentation is developed to meet the needs of the surgeon
- Specialty procedures include femtosecond cataract surgery, limbal relaxing incisions (LRI) and Descemet's Membrane Endothelial Keratoplasty (DMEK) procedures

Femtosecond Instruments

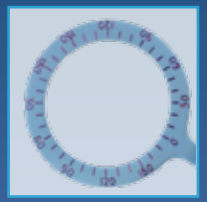
- Wound dissectors were developed for opening up the femtosecond incision
- Special cannula designs are used to separate the lens from the capsule
- ZeroPhaco™ Irrigating/ Aspirating (I/A) handpieces are specially designed to remove femto dissected nuclei



Limbal Relaxing Incisions (LRI) Instruments

- Diamond knife blades are designed with a depth-limiting guard to help the surgeon control how much corneal thickness is cut
- Gauges with degree markings assist surgeons with the placement of the incision

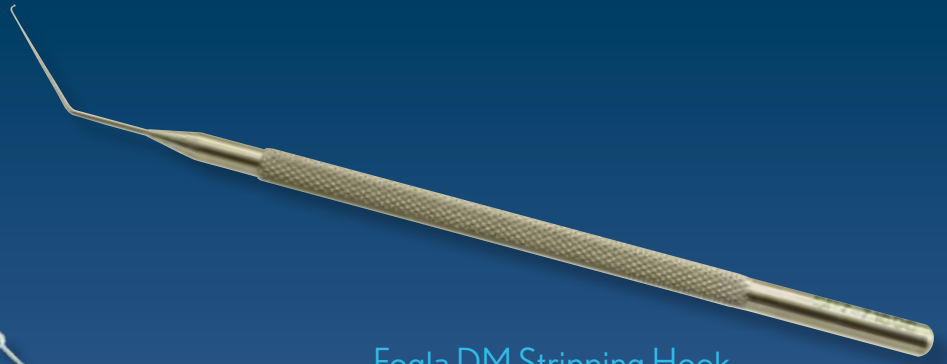
Nichamin LRI
Diamond Knife



Wallace Mendez
Degree Gauge

DMEK, Corneal Tranpslant Instruments

- Hooks are designed to score and remove the unhealthy tissue
- Manipulators are designed to maneuver donor tissue into place

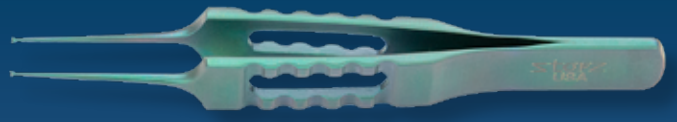


Fogla DM Stripping Hook

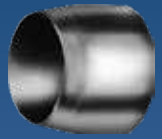
John DMEK Smoother

DMEK, Corneal Tranpslant Instruments

- Forceps are designed to handle donor tissue while minimizing damage
- Trephines are designed to prepare the donor tissue



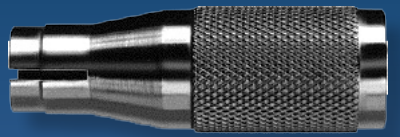
John DMEK Lifting Forceps



Trephine Blade

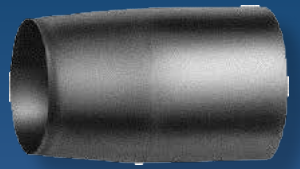
Trephines

Corneal transplant trephines and cutting blocks are used in corneal transplant procedures



Universal Handle for Blades

Tanne Univ Disposable Trephine Blade - 8.00mm



Disposable Trephine Blades - Long - 8.00mm

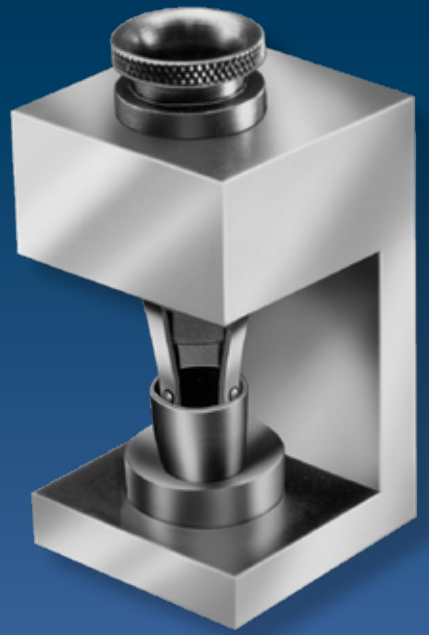
Trephines

To remove the corneal button from the donor eye:

- The trephine placed vertically and centered on the cornea is steadied in position with the index finger and rotated between the thumb and second finger by its handle
- The trephine is withdrawn
- Curved corneal scissors are inserted through the penetrated section and the incision is completed

Trephine Blocks & Punches

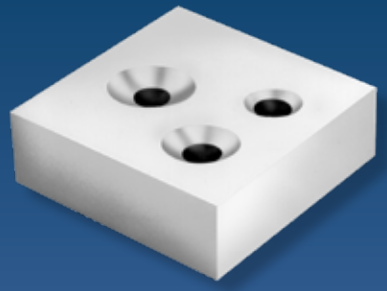
- Cornea is placed in the concavity of a Teflon block
- The block is used with disposable trephine blades
- The trephine is pressed firmly with the thumb to penetrate through the cornea to the backing block



Universal Trephine Handle with Cottingham Punch

Trephine Blocks & Punches

- Some blocks have centering target for increased precision of cut



Brightbill Corneal
Cutting Block

John DMEK
Cutting Block

Choppers & Manipulators

- Most commonly used in cataract surgery to manipulate the natural lens during extraction and IOL after insertion
- A chopper assists with cutting the natural lens while pushing it towards the phaco handpiece during extraction

Slade Coaxial Chopper/Manipulator

Palydowycz Finger Manipulator

Choppers & Manipulators

- Designs are specific to procedure techniques such as Stop and Chop, Vertical Chopping, Microincision, Divide and Conquer, and Femtosecond procedures

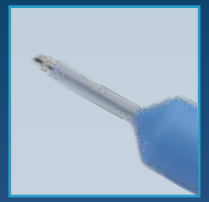
Akahoshi Prechop Forceps
Straight

Tran Femto
Ergo Chopper

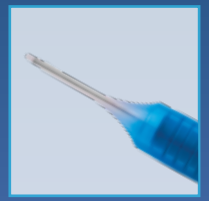
Irrigating/Aspirating Handpieces

- Designed to irrigate the anterior chamber while removing lens particles and cortex during cataract surgery
- Some handpieces are also designed for capsule polishing once the natural lens is removed

ZeroPhaco™ I/A Handpiece



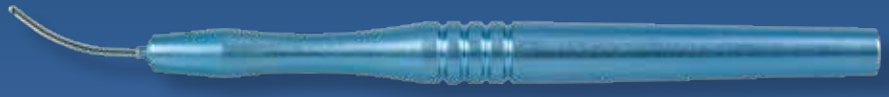
CapsuleGuard® I/A Handpiece



Irrigating/Aspirating Handpieces

- Used to remove viscoelastic once IOL has been placed
- Special designs are available for soft nuclei, femtosecond procedures
- Designs with flexible tips protect the capsule

Irrigating/Aspirating Handle
Stellaris ® System



Bimanual Handpiece Irrigating

Irrigating/Aspirating Handpieces

Reusable

- One-time purchase of handpiece
- Must follow sterile processing guidelines closely to ensure handpiece is sterile for each procedure

Irrigating/Aspirating Handle Stellaris® System

Single Use

- Packaged sterile for each procedure
- No reprocessing necessary

CapsuleGuard® I/A Handpiece

Markers

- Designed to mark the cornea in procedures where precise measurements are necessary
- Specific to procedures such as LRI, Premium and Toric IOL placement, LASIK and Corneal Transplant

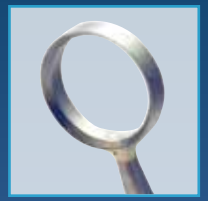
MacRae Mini LASEK/PRK
Well 6.5 mm

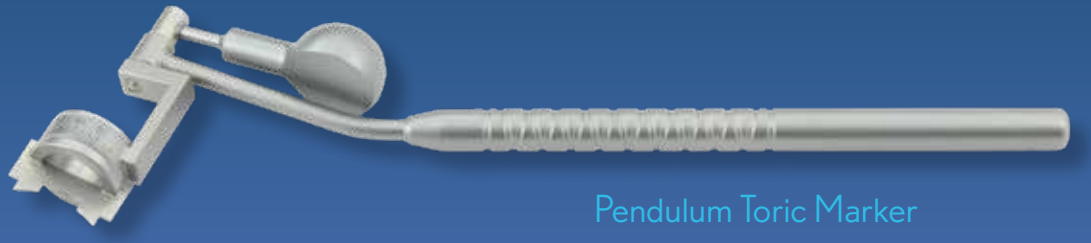
Whitman Double-Ended
LRI Marker

Markers

- Some markers also include gauges to measure degrees and capsulorhexis size for precise placement

Wallace Capsulorhexis Gauge





Pendulum Toric Marker

Cannulas

Air Injection Cannulas

- For maintaining or forming the anterior chamber with air during surgery

Fogla Air Injection Cannula

Anterior Chamber Maintainers

- For maintaining or forming the anterior chamber with air or fluid during surgery
- Disposable is recommended due to viscoelastic clogging

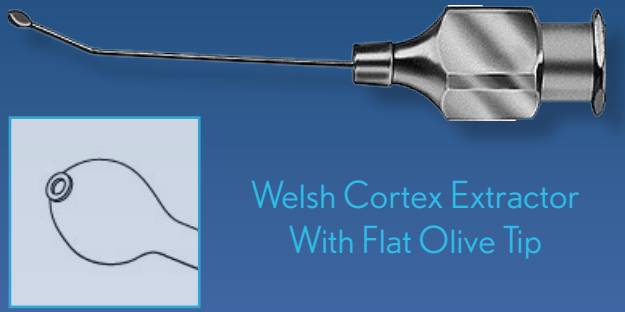
Lewicky Anterior Chamber Maintainer

Cannulas

Cortex Extractors

- Used to aspirate the cortex when the chamber is maintained with either a chamber maintainer or viscous material by attaching the cannula to a syringe
- Useful for aspirating the cortex from behind the superior iris between the 10:00 and 2:00 position

Simcoe Cortex Extractor - 21mm



Welsh Cortex Extractor With Flat Olive Tip

Cannulas

Viscoelastic Injection Cannulas

- Used to inject viscoelastic into the anterior chamber

Viscoelastic Injection Cannula

Cannulas

Hydrodissection Cannulas

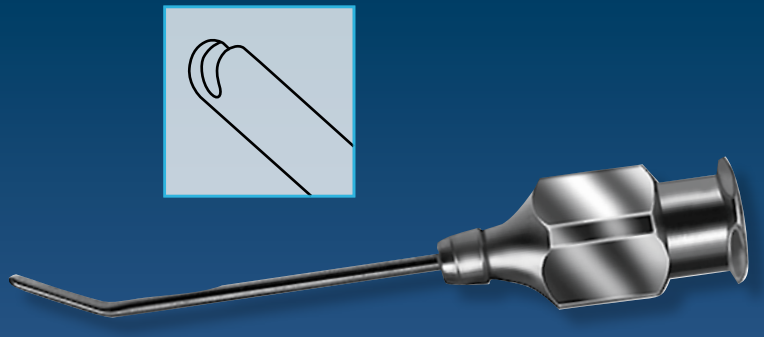
- Used to separate the lens cortical material from the capsule before phacoemulsification in cataract cases
- These cannulas are designed to direct a focused BSS fluid stream at the edge of the capsulorhexis. This creates a fluid wave that frees the lens and reduces stress on the capsule and zonules during lens extraction

Hu Femto Hydrodissection Cannula

Cannulas

Irrigating Cannulas

- For maintaining or forming the anterior chamber with air or fluid and for keeping the cornea moist during surgery



Bishop-Harmon Irrigating Cannula

Cannulas

Irrigating/Aspirating (Cannulas for Planned Extracapsular Cataract Extraction (ECCE))

- Irrigation and anterior chamber maintenance is provided through the irrigating bottle, connected to the irrigation hub of the irrigating/aspirating cannula

Simcoe Double-Barreled Irrigating-Aspirating Unit

Cannulas

Irrigating/Aspirating (Cannulas for Planned ECCE)

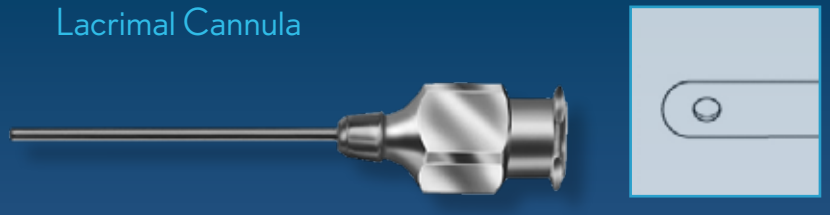
- Aspiration through the tubing connected to a syringe
- The aspiration hub is connected to a syringe or I/A machine
- May be used for aspirating cortical debris, and vacuuming and aspirating viscous material

Cannulas

Lacrimal Cannulas

- For irrigating and/or probing lacrimal ducts

Lacrimal Cannula



Weil Lacrimal Cannula

Cannulas/Needles

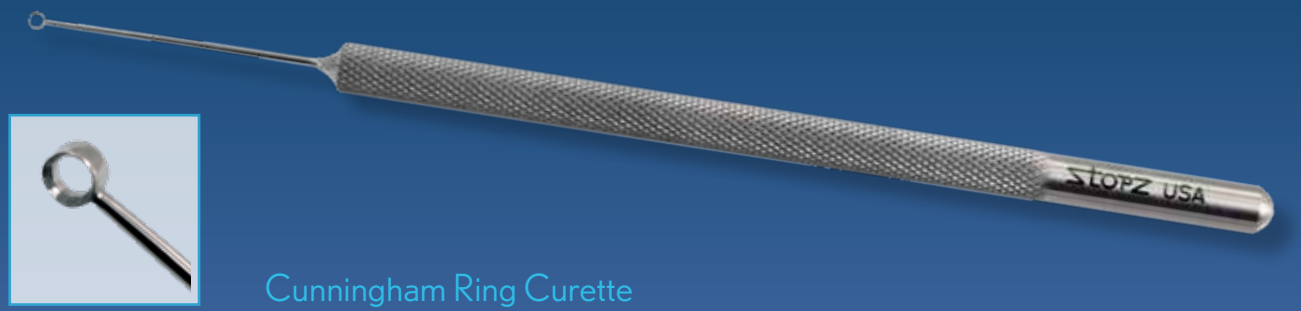
Retrobulbar Needles

- Designed for retrobulbar injection
- Disposables are mainly used due to the need for sharpness
- Reusables can lose sharpness and end up with burs on tips

Retrobulbar Needle

Curettes

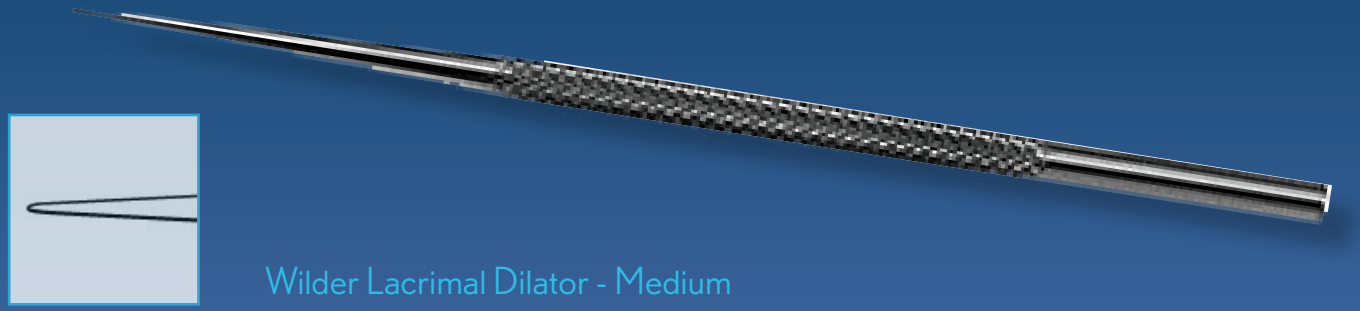
- Curettes are used to excise a chalazion from the eyelid
- Also used for foreign body removal and smoothing of the corneal epithelium



Cunningham Ring Curette

Dilators

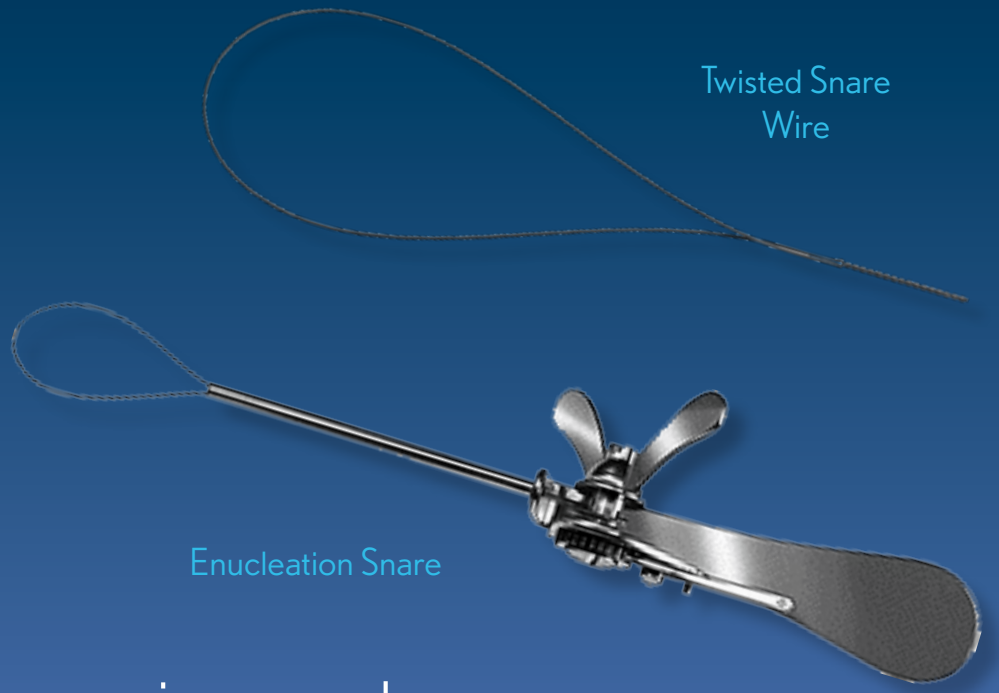
- Enlarges the orifice of the punctum to permit entry into the lachrymal canaliculus of the lachrymal needle



Wilder Lacrimal Dilator - Medium

Enucleation Snares

- This device is used to sever the optic nerve when performing an enucleation
- The rectus muscles are severed and drawn away from the eyeball
- The snare is placed over and behind the eye
- It is then made smaller until the nerve is severed



Enucleation Spoons

- The enucleation spoon is used to retract the globe from its socket during the enucleation procedure
- The spoon is designed to straddle the optic nerve and pull the globe forward until the nerve can be severed

Wilder Lacrimal Dilator - Medium

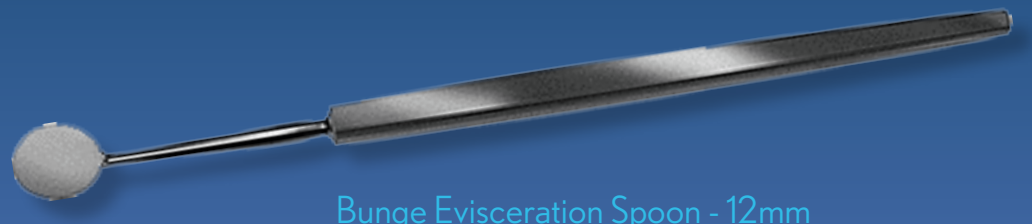
Probes

- Assist in the probing of tear ducts

Wells Enucleation Spoon

Evisceration Spoons

- An evisceration spoon is used to remove the contents of a diseased eye
- The sclera is left intact and an implant is enclosed inside the globe
- The artificial (prosthetic) eye has greater mobility than when the entire globe is removed



Bunge Evisceration Spoon - 12mm

Flieringa Rings

- Maintains rigidity of the sclera during difficult eye surgeries
- Most commonly used in penetrating keratoplasties for young patients and cases with low scleral rigidity

Flieringa Rings - 12mm-22mm

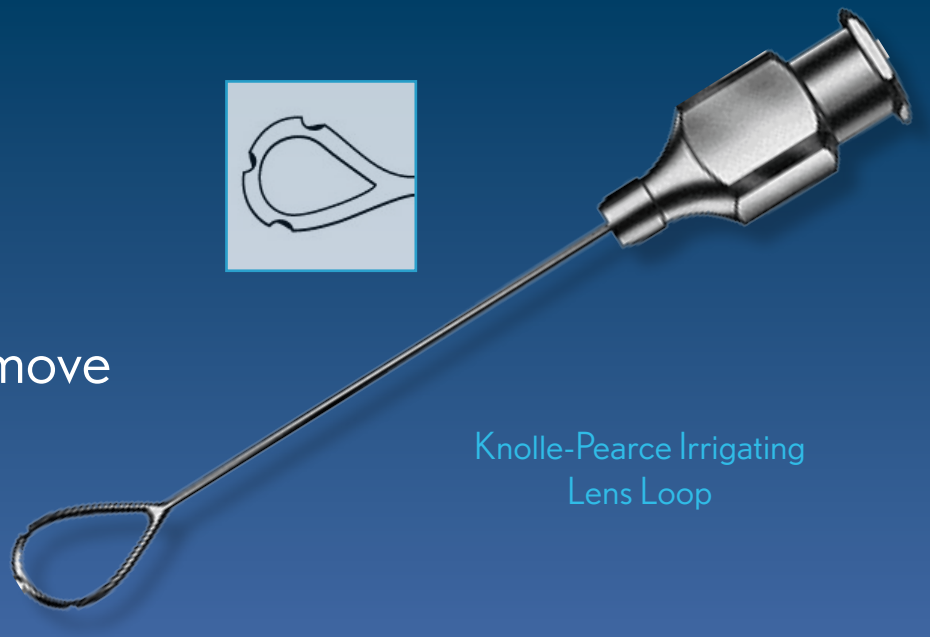
Foreign Body Spuds

- Spuds are used to remove foreign bodies from the cornea/eye with a dissection or scraping technique

Ellis Foreign Body Spud

Lens Loops (Vectus)

- The lens loop is used to assist in removing the lens out of the capsule during an extracapsular cataract extraction
- It is often used to engage and remove a dislocated lens



Knolle-Pearce Irrigating Lens Loop

Corneal Rust Ring Removers

- Motorized burr used to remove rust ring after foreign body has been removed

Algerbrush Rust Ring Remover 1.0mm

Scrapers/Polishers

- Used to polish the capsule for removal of lens epithelial cells
- Has either a roughed surface to scrub or a sharp edge to scrape lens cells off capsular surface

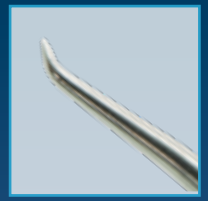
Scrapers/Polishers

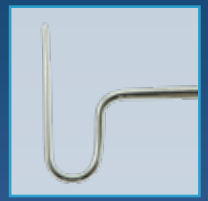
- Capsule polishing is especially needed in specialty cataract procedures such as premium IOL placement
- Single-use options are available with a flexible tip for capsule protection

CapsuleGuard® I/A Handpiece

Spatulas

- Spatulas are semi-sharp or dull instruments and are used selectively to pull away, mash or pick up various tissues (vitreous, iris, sclera, cornea, etc.)
- Spatulas are designed with a wide variety of tip and handle designs

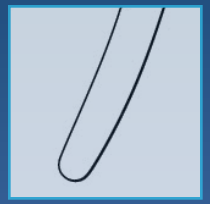


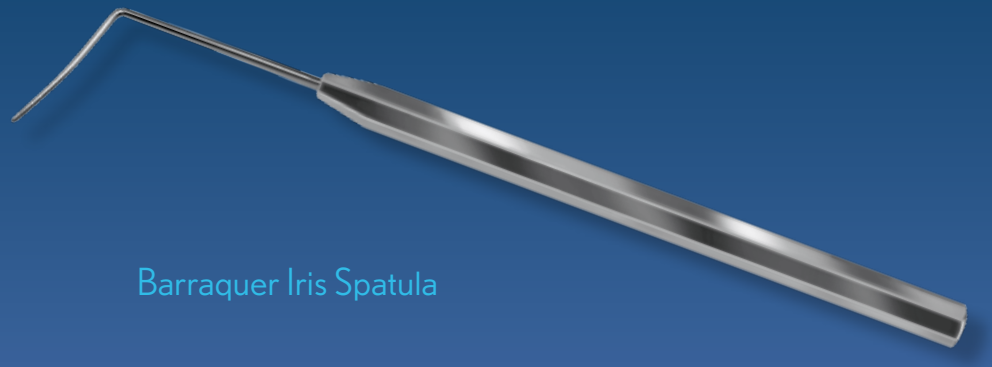


MacRae LASIK Flap Spatula

Iris Spatulas

- Used to reposition and arrange the iris following surgery and prior to closing the wound

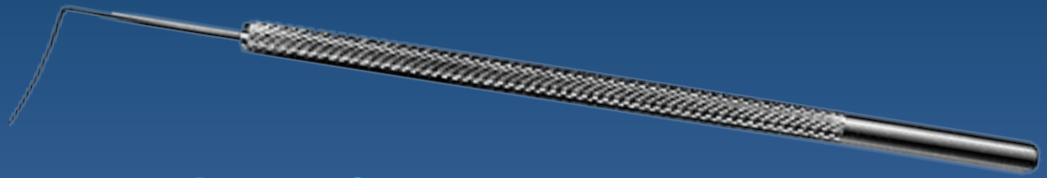




Barraquer Iris Spatula

Cyclodialysis Spatulas

- This spatula is used to separate the ciliary body from the scleral spur to produce a drainage channel between the anterior chamber and the suprachorodial space



Barraquer Cyclodialysis Spatula

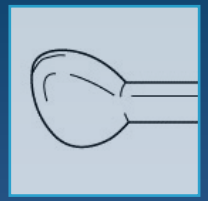
Calipers

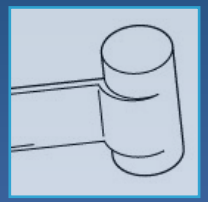
- Instrument for measuring thickness and internal or external diameters inaccessible to a scale, consisting of a pair of pivoted legs, adjustable
- Usually have a sliding or adjustable arm

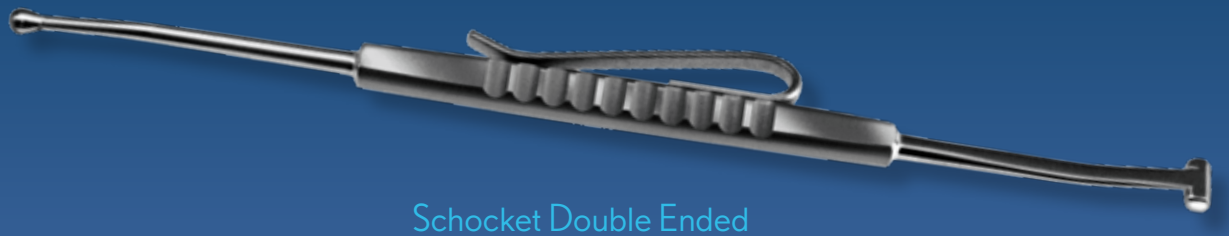
Castroviejo Caliper

Depressors

- Instrument used to depress and rotate globe during examination







Schocket Double Ended
Scleral Depressor

Tonometers

- Designed to measure the intraocular pressure of the eye by indention of the cornea by a plunger
- Accurate measurement of intraocular pressure is the most important single test in the detection of glaucoma

Allen-Schioetz Tonometer

Materials

- Most commonly used materials for surgical instruments:
  - Stainless Steel
  - Titanium
- Metals are properly processed and heat treated to ensure durability of the instruments

Materials

- Instruments finishes include:
  - Bright, smooth polished finish
  - Sandblasted, satin finish that eliminates glare from surgical lights
  - Colored for easy identification

Straiko Twin Ring Forceps

Nichamin Degree Gauge

StableGrip® ILM Forceps

Materials

Stainless Steel vs. Titanium

Stainless

- holds edges
- polishes better
- more affordable

Titanium

- more elastic/flexible
- lighter weight
- color is adaptable

Post-Test

Thank you for completing the educational material for Utilization of Ophthalmic Surgical Instruments.

Click the link below to take the post-test and receive your continuing education certificate (login required).

www.StorzOphthalmicCE.com