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Basic Suturing

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Objectives

- At the end of this workshop, the participant will be able to verbalize an understanding of:
  1. Assessment of a wound
  2. Cleansing of a wound
  3. Determining the best closure method
  4. Selection of the appropriate anesthesia
  5. Placement of simple interrupted sutures
  6. Punch biopsy procedure
  7. Eliptical biopsy procedure

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BASIC SUTURING MOVIE

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Wound Assessment

- Look for ANTs
  - **A**rterial bleeding

Anyone ever forget to turn the stopcock on your Art Line???? Then you know what an arterial bleed looks like. Sometimes direct pressure or a B/P cuff will work enough to allow you to clean up your wound enough to seen where the bleeder is, then you can tie it off if you need to

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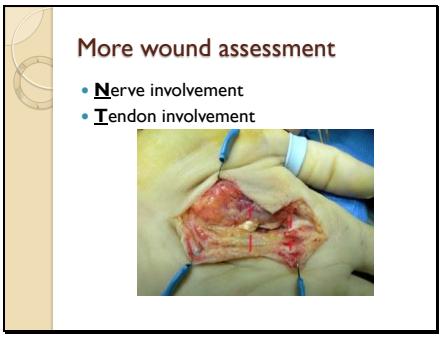

Nerves are small white fibers. Many people don't try to identify them during the assessment process.

Tendons are much easier to see, Here you can see the ends of the nerve marked by the red lines. Tendons are thick, silvery-white bundles (think of chicken parts). Look for nicks or breaks on them. If the skin to hold things together while the pt is transported to the hand surgeon or the surgeon comes in to see the pt. Test for the tendons even if you don't see them.

While you are assessing the wound, take time to start considering the best way to close the wound.

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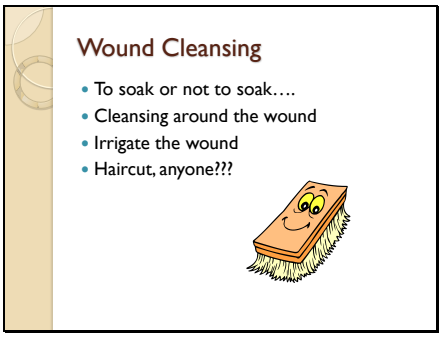

I learned from a plastic surgeon not to soak. Think about sitting in the tub too long, or washing a lot of dishes by hand. Your skin wrinkles up this can also happen if you soak a wound, causing the loss of integrity of the wound edges, and allowing the suture to pull through the edge.

Most offices and urgent cares are still using Betadine to cleanse wounds. Whatever you are using, it is just like starting an IV: start at the center and work your way out. Always follow with sterile saline. You can pour the saline, or use a sterile 4x4 and hold it in a clamp to use. The hospitals are now using _____ which is easier to use and probably more effective. This can be scrubbed in any direction, as long as there is solution on the swab.

If the wound is dirty or deep, use a large syringe and a large bore needle to irrigate the would with saline. Irrigate, irrigate, irrigate. Make sure the wound is cleaned out. This will enable you to see what your are working with, as well as help avoid an infection.

Don't cut the hair around the laceration if you can help it. Do not shave it, either. That makes micro openings that can allow more infection sources. Paste the hair out of the way with KY! Works really well. You can also braid the hair into very small braids over a small laceration for closure.

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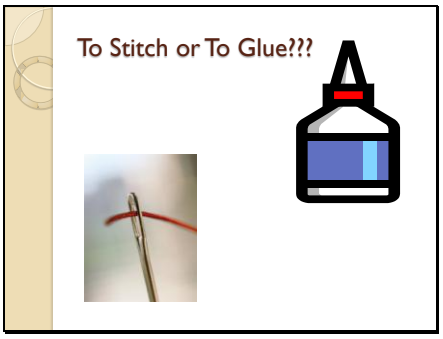

No matter what the staff in our urgent care says, the decision is not made based on how long you have until the clinic closes!!
While the skin closes in a week or so, the underlying tissues take much longer, perhaps even a year, to fully recover.

Simple interrupted sutures are the easiest to do, if appropriate for the wound. That is what you will practice today.

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Another option is staples. Staples work very well on scalps and extremities, and are great on knees. Do not use them anywhere you want a good cosmetic outcome. Staples are fast, and are made of a non-reactive material.

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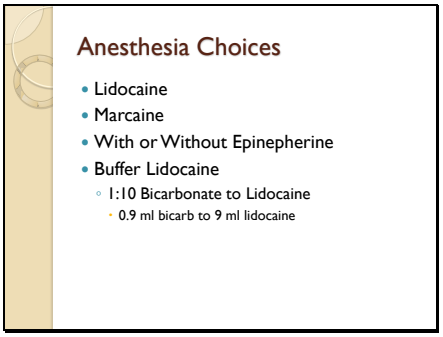

You have a good handout on anesthesia choices. Most places have Lidocaine, 1 and 2%, with and without epi. Make sure you do not use epinephrine on digits, ear lobes or penis, as it will significantly reduct the circulatin and can cause tissue necrosis.
Try buffering the Lidocaine and it won't hurt as much. Use 1:10 Sodium bicarb to Lidocaine. That is 0.9 ml bicarb to 9 ml lidocaine. It is stable for 24 hours.
For opening abscesses, cold spray works very well.

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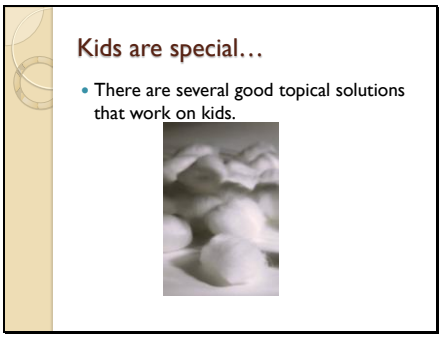

For minor things like immunizations, you can use EMLA cream, but it takes about 30 minutes to work.
For lacerations on kids' heads and faces, saturate the cotton ball with TLE or LET or CAT solution, gently open the wound edges, place the cotton inside. Place a piece of tape over the cotton ball and have the parents tap it gently every few minutes. This also takes about 30 minutes, but it will blanch the area just like an injection.

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Injecting the Wound

- You already have an opening, why make another?????
- Draw up with a large needle (for speed).
- Inject with a small needle (for comfort and more PSI).

Inject through the open wound into the wound margins. You have already cleansed it well, and the needle is sterile, so go ahead! \I like to use a 32 gauge 1 ½" needle to inject. Watch for the margins to turn white, then you know you have good anesthesia.

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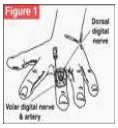
Digital Nerve Block

- When working on a small distal area, anesthetize the whole area.
- Toenails
- Suturing fingers



Let's look at the digital nerve handout. There are 2 common ways to perform this. I use the straight down on both sides, then across the top method. Others prefer the X method. No matter which you use, make sure you give a good 15-20 minutes for the block to work. You will use this a lot, hands, feet, toenail injuries.

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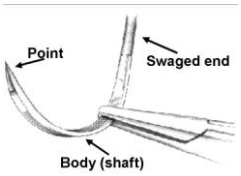
Needle Anatomy



Most sutures come as a single piece, with the suture material swaged onto the base of the needle. The needle should be grasped in the tip of the needle holder about 2/3 of the way back from the point. Grasping further back at the swaged end tends to weaken the needle and its attachment to the suture, and you are likely to bend the needle. I have included some pages from the Ethilon Wound closure Manual so you can see some different types of closures, knots and needles.

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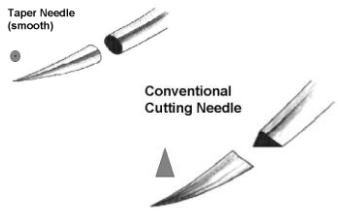
Types of needles



There are many different needle types, but the chief distinction to be made here is the difference between taper or "smooth" needles in contrast to cutting needles. **Taper needles** do just what their name implies: they gradually taper to the point, and a cross-section anywhere along the shaft would reveal a round shaft, as shown in the inset. Taper needles are used for tissue that is easy to penetrate, such as bowel or blood vessels. In contrast, the tip of **cutting needles** is triangular in shape, and the apex forms a cutting surface, which facilitates penetration of tough tissue, such as skin. Cutting needles make it much easier to penetrate tough tissue. Penetrating skin with a taper needle is very difficult and causes excess trauma to the skin because of difficulty in penetration and the need to grasp the skin edge very tightly with forceps. Consequently, you should never use taper needles to suture skin.

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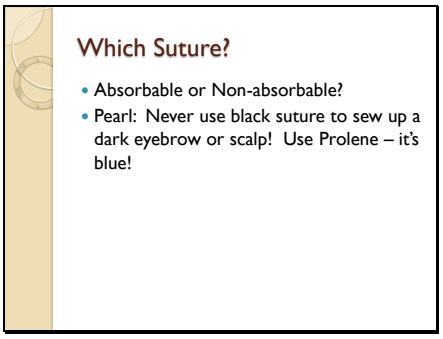

Non-absorbable sutures are made of materials that are not readily broken down by the body's enzymes or by hydrolysis. There are naturally occurring non-absorbable materials e.g., silk, cotton, and steel) and synthetic non-absorbable materials (e.g., nylon and Prolene, Mersilene). In some cases they are left in place indefinitely (e.g., when used to close the abdominal fascia), and in other cases they are removed after adequate healing has occurred (e.g., nylon sutures to close a superficial laceration).
Absorbable suture materials are those that are broken down. The original absorbable suture materials were **plain and chromic "cat gut,"** which actually consisted of processed collagen derived from the submucosa of animal intestines. Plain gut is broken down enzymatically after about 7 days. Chromic gut is collagen treated with chromium salts to delay break down. Chromic gut typically loses its strength after 2-3 weeks is completely digested after about 3 months. Now there are many **synthetic absorbable materials made from polymers (e.g., Vicryl and Monocryl)**. These materials are broken down non-enzymatically by hydrolysis; water penetrates the suture filaments and causes breakdown of the polymer chain. As a result, synthetic absorbables tend to evoke less tissue reaction than plain or chromic gut.

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Many offices and ERs are using one time suture sets like the ones you have today. They are inexpensive, but sometimes the instruments leave a little to be desired.
For skin closure use a fine-toothed forceps, such as an Adson forceps. The forceps should be held so one arm is an extension of thumb and the other is an extension of your index finger. The base of the forceps should rest on the dorsal surface of the web space between the thumb and index finger. Use only forceps with teeth. Use the arm with a single tooth to gently elevate the skin edge. Avoid crushing the skin edges with the forceps. This further traumatizes the wound edge and impedes healing.

The forceps allow you to create counter traction and control the position of the skin edge to facilitate passage of the needle perpendicularly through the skin. The forceps should also be used to grasp the needle when repositioning it in the needle holder. You should never touch the needle with your fingers.

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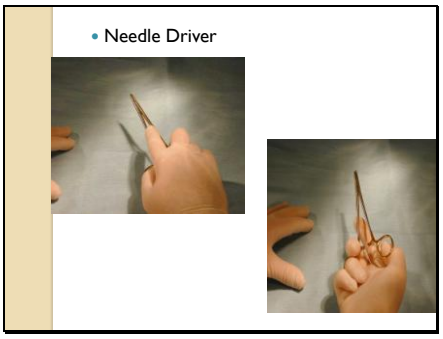

There are several techniques for holding the needle holder. The most common method is to place the thumb and ring finger slightly into the instrument's rings. This allows you to pronate and supinate and to open and close the jaws of the needle holder. Avoid inserting your fingers far into the rings of the instrument, since this will tie up your fingers and impede your mobility. Some surgeons do not put their fingers into the rings at all and simply grasp the rings and body of the needle holder in the palm of their hand.
What is a throw? It is a pass of the suture around the needle driver to start the formation of a knot.
Since monofilament materials are more likely to slip, one generally ties knots with 5 or 6 "throws" when using monofilament materials (in contrast to 3 throws with silk or Mersilene). Despite the greater number of knots required, monofilament materials such as nylon are generally preferred for skin closure because they stimulate less tissue reaction, are less traumatic, may have less likelihood of infection, and provide a better cosmetic result.
I rarely use 6 throws, no matter what suture I am using. I use 4 on the first pass, then 3 or 4 after that.

Look at your handout on dermabond, and you will see a chart for indications for dermabond.

If you decide to stitch, use the smallest appropriate suture. As a rule of thumb, I use 4-0 on extremities, and 5-0 or 6-0 on the face. I usually like a little needle, too, unless the patient has thick skin or is very suntanned. You will get comfortable with the different sizes of needles and suture.

The set should also have 2 pair of scissors, one regular for the suture material, and on pair of small iris scissors which are supposed to be used for cleaning tissue borders. You should also have a pair of curved hemostats, and usually a scalpel or scalpel holder.

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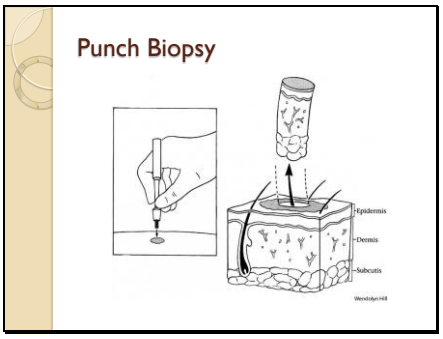

This is a very simple procedure. You should have a good handout on this. Make sure you select a punch that is larger in diameter than your lesion. Anesthesia is necessary, after all, you would not let someone grind a hole in your arm…
Gently stretch the skin, place the punch on the skin, then push and twist up to the hub. Remove the punch, take a clamp and gently pull up the specimen. Cut it with a scalpel or scissor. Sample goes in a formalin cup, labeled of course. When you let go of the skin, it may pop back together, or it may need one suture.

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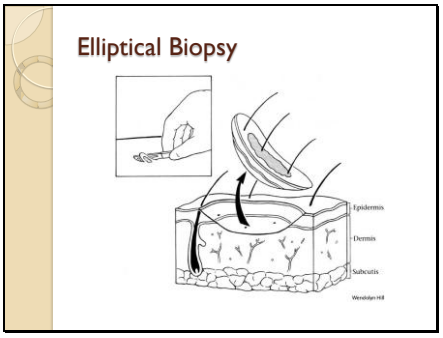

Remember to make every attempt to make your elliptical incision in the same direction as the planes of the skin. The width of the excised tissue should be 3-4 times the height.

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