

# Basic Suturing and Wound Techniques

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# Objectives

- Identify the various types and sizes of suture material.
- Choose the proper instruments for suturing.
- Identify anesthetic agents
- Determine whether a wound requires suturing.
- Under supervision, anesthetize, clean, and close a wound with sutures.
- Recommend appropriate laceration care and follow-up.

# Introduction

- Suture means to 'sew' or 'seam'.
- In surgery suture is the act of sewing or bringing tissue together and holding them in apposition until healing has taken place.
- A suture is a strand of material used to ligate blood vessels and to approximate tissues together.

# Goals of Suturing

- Suturing is performed to
  - Provide adequate tension
  - Maintain hemostasis
  - Permit primary intention healing
  - Provide support for tissue margins
  - Reduce post-operative pain
  - Prevent bone exposure
  - Permit proper flap position
  - Hold severed tissues in close approximation until the healing process provides the wound with sufficient strength to withstand stress without the need for mechanical support.
  - Since wounds do not gain strength until 4-6 days after injury, the tissues are approximated till then by sutures.

# Types of Suture

## Absorbable

### PLAIN GUT:

- Derived from the small intestine of healthy sheep.
- Loses 50% of tensile strength by 5-7 days.
- Used on mucosal surfaces.

### CHROMIC GUT:

- Treated with chromic acid to delay tissue absorption time.
- 50% tensile strength by 10-14 days.
- Used in episiotomy repairs.

### Polydioxanone (PDS®)

- Monofilament
- 50% tensile strength = 30+ days
- Sites = need for prolonged strength

### Polyglycan 910 (Vicryl®)

- Braided, synthetic polymer
- 50% tensile strength for 30 days
- Used: subcutaneous

## Non-Absorbable

### Nylon (Ethilon®):

- Monofilament nylon
- Most commonly used in surface closures.

### PROLENE:

- Stronger than nylon
- Better overall wound security

### BRAIDED:

- Include cotton, silk, braided nylon and multifilament dacron.
- Until the advent of synthetic fibers, silk was the mainstay of wound closure. It is the most workable and has excellent knot security.
- Disadvantages: high reactivity and infection due to the absorption of body fluids by the braided fibers.

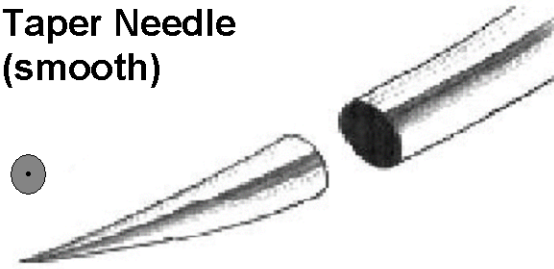
# Suture Size

- 5-0 is small, and 2-0 is **big**
- The usual sizes = 3-0 or 4-0
- Examples:
  - Might use 5-0 on the face
  - 2-0 on the plantar surface of a foot

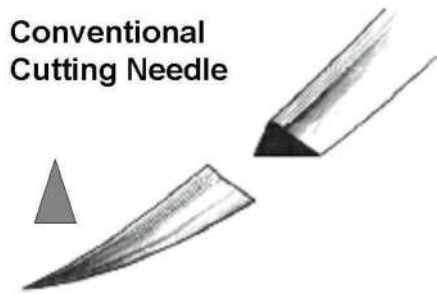
## Suture Needles

- Taper needles
  - Easy to penetrate tissue (bowel or blood vessels)
- Cutting needles
  - Triangular tip shape
  - Apex forms cutting surface
  - Tough tissue, such as skin
- Reverse cutting needle
  - Cutting edge faces down instead of up.
  - Decrease likelihood of sutures pulling through tissue in some cases

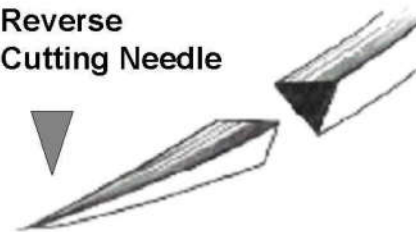
Taper Needle  
(smooth)



Conventional  
Cutting Needle

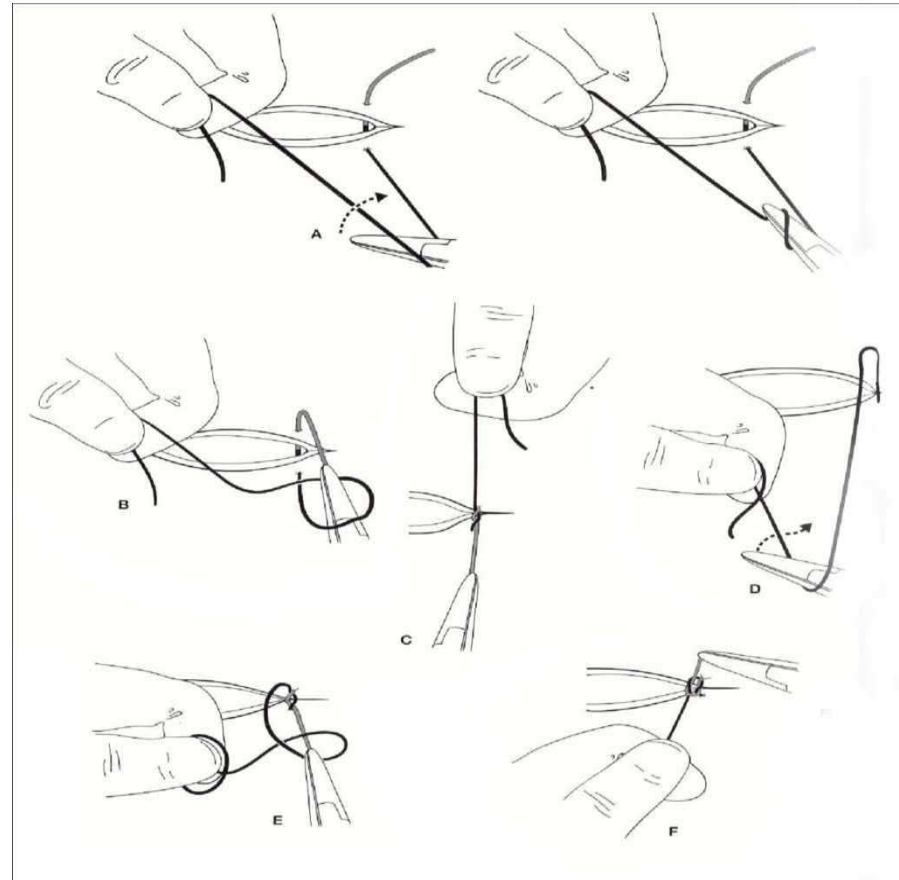


Reverse  
Cutting Needle



# Instrument Tie

- First knot is looped around the needle drivers twice to secure the knot
- Each subsequent loop only goes around the needle driver once
- Pull the ends away from each other after each loop





# Simple Interrupted Sutures

- This suture is used for simple laceration closures or closure of office procedures like biopsies or lesion removals
- It is also the basic suture used inside the wound to close deep sutures
- It is useful in that a few sutures can be removed at a time instead of all at once to allow for slower wound healing

# Continuous Sutures

- The continuous suture as its name suggests, only has a knot at the beginning and the end
- There are several methods of continuous suture – locking and non-locking
- The knots must be very secure and minimal tension on the wound or the wound will come apart if one loop or knot gives way
- The advantage is that it is very quick and the wound tension is even across the wound

# Horizontal Mattress

- Used with wounds with poor circulation
- Helps eliminate tension on wound edges
- Requires fewer sutures to close a wound
- Can be placed quite quickly
- Can be done as a continuous suture

# Vertical Mattress Sutures

- Deep and shallow approximation of the tissue
- Can be used for wounds under tension
- Can be useful with lax tissue e.g. elbow and knee
- Should not be used on volar surface of hands or feet or on the face because of blind placement of the deep part of the suture
- “Far-Far-Near-Near”

# Sub-Cuticular Closure

- Used for cosmetic closures
- Use an absorbable suture if you plan to leave the sutures in and bury the knots
- Use either nylon or prolene (best) and keep the suture sliding while you are closing. The suture then can be easily removed with no exterior marks. The ends can be taped or a knot on the skin
- At each entry point, enter across from the last exit with slight overlap

Let's Practice