

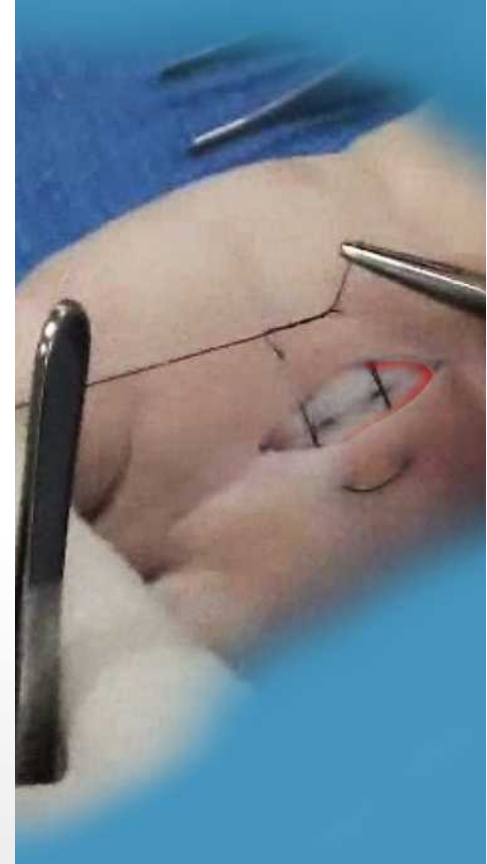
# BASIC AND ADVANCED SUTURING SKILLS WORKSHOP

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BY

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# DISCUSSION POINTS

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aseptic vs sterile technique

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surgical conscience

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common surgical instruments

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choice of anesthetic

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preparing the wound

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correct knot tying methods

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wound closure with a variety of suturing techniques

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common pitfalls

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practical tips on improving your technique

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guidelines for choosing the correct suture and needle

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# WOUND HEALING AND SCARS

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The goal of optimal wound closure is to obtain a fine line scar that maintains both the form and appearance of the tissue.



It is important to let your patient know that any time there is an incision there is going to be a scar.



Careful technique and close attention to tissue integrity this scar can be minimized. Know when it is a closure that you should not attempt e.g. lip, eyelid, across a joint, tendon involved, or the web space of a hand.

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# PREPARATION

Plan the incision or type of closure

Gather equipment – irrigation, syringes, anesthetic, instruments, suture, drapes, dressing

Time out: Check patient name and sign a consent. Check what procedure is to be done

Scrub glove and drape

Prepare the skin – betadine on the outside

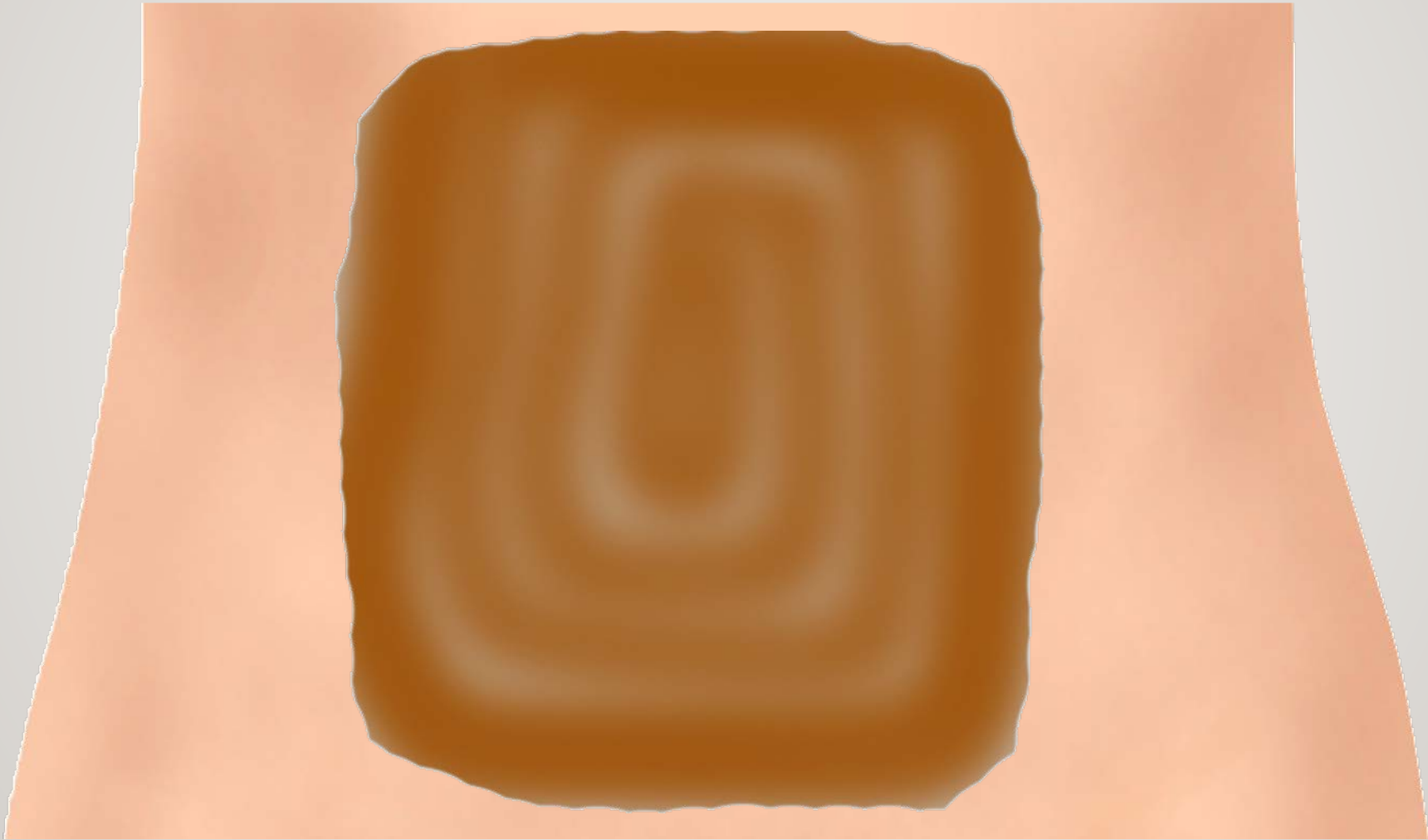
Local anesthetic – lidocaine or bupivacaine

Debridement or incision

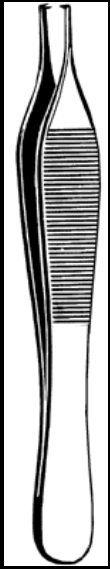
Undermining where necessary



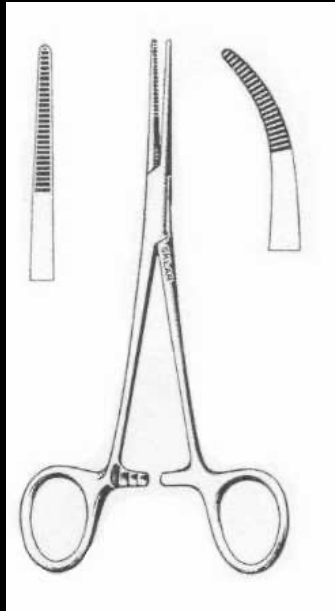
# Wound Preparation



Start in the center and swab in circles going outward



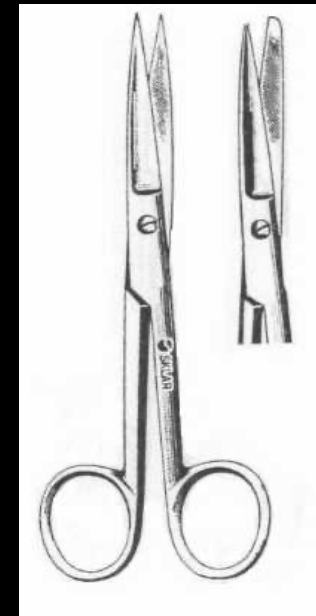
adison forcep



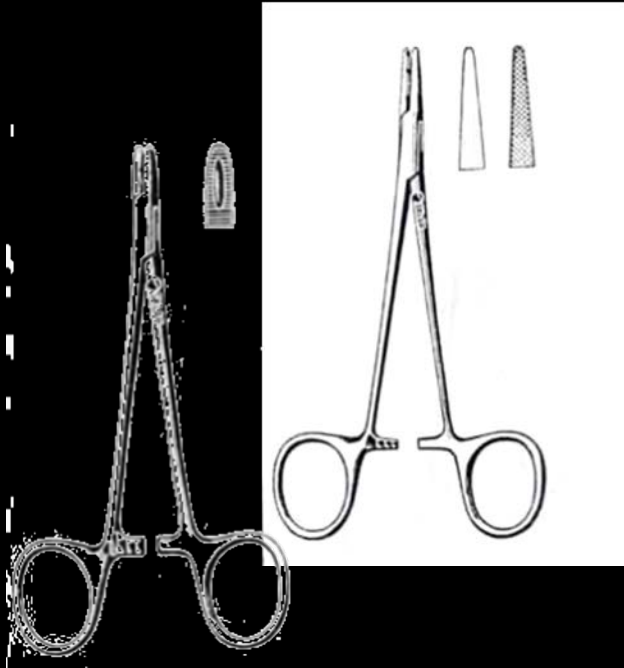
hemostat



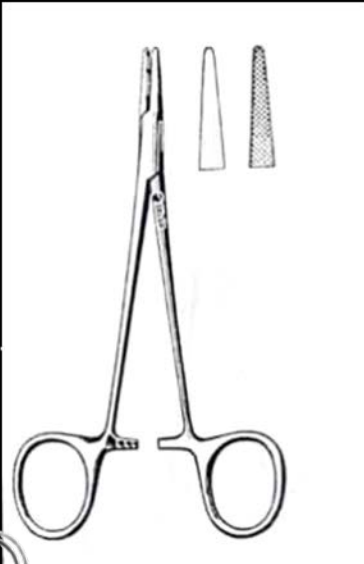
metzenbaum scissors



suture scissors



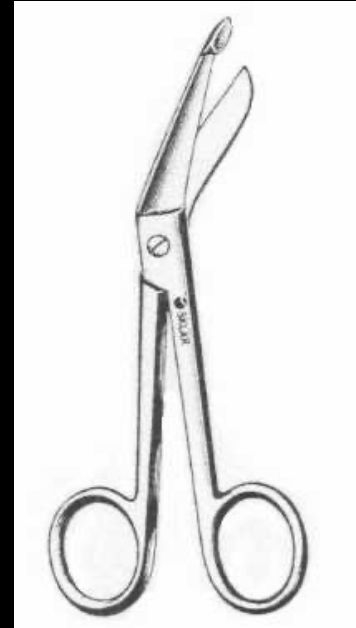
Needle holders



blade handle



suture removal scissors



bandage scissors

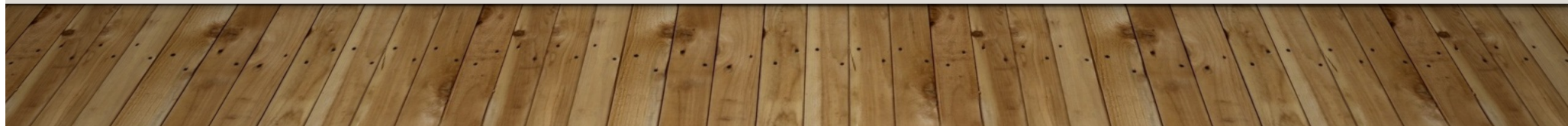
# STERILE INSTRUMENTS

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- Have the instruments been sterilized and packed in sterile packages?
- Has the indicator tape changed color?
- Is the package still sealed and double wrapped?

Sterilize with:

- Autoclave 15- 20 psi 220 to 250 degrees F
- Gas
- Liquid



# ANESTHETIC

Lidocaine 1% or 2% - inject locally or a regional block

- gives anesthesia and reduces muscle movement

Bupivacaine (Marcaine) 0.25% or 0.5%

- gives anesthesia only

lidocaine and bupivacaine can be mixed half and half

Epinephrine can be added to increase anesthetic time and decrease bleeding – don't use on nose, toes, fingers, nose (penis)

May be buffered - 9:1 with sodium bicarbonate, to reduce pain on injection (e.g. remove 2 mL of 1% lidocaine from 20 mL vial, and add 2 mL of sodium bicarbonate solution to vial)

# ANESTHETIC

## Local Lidocaine (Xylocaine) 1% or 2%

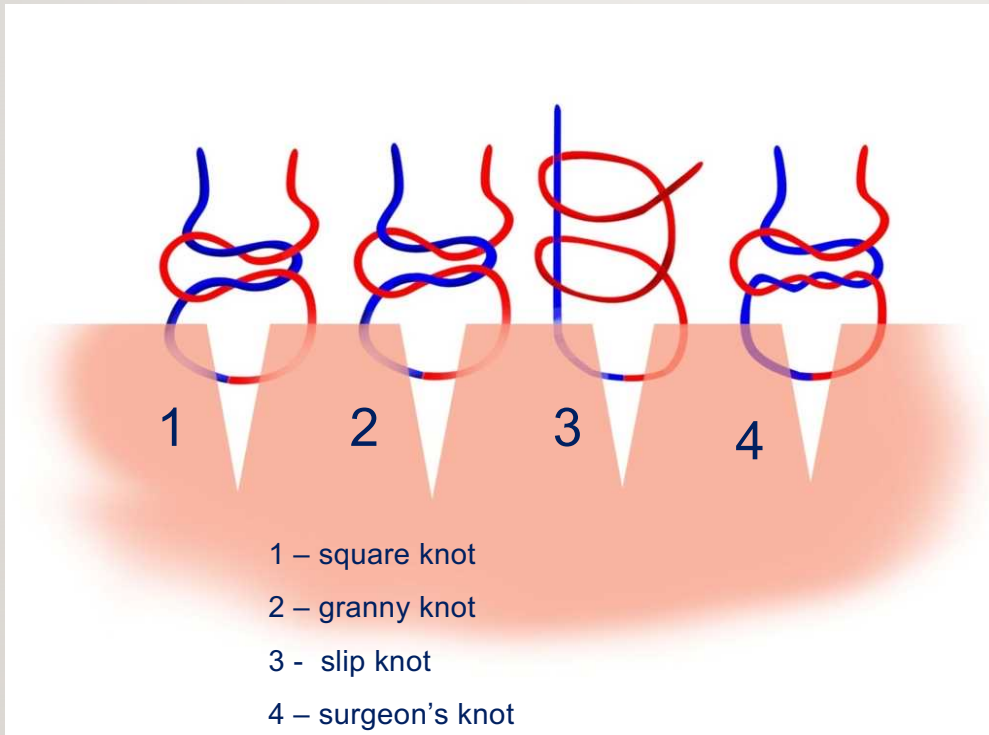
- Onset: 2 minutes
- Duration: 1.5 to 2 hours
- Action : anesthesia and reduced muscle movement
- Max dose: 4 mg/kg to 280 mg (14 ml 2%, 28 ml 1%)

## Lidocaine with Epinephrine 1:100,000 or 1:200,000

- Onset: 2 minutes
- Duration: 1 – 3 hours
- Action : anesthesia and reduced muscle movement
- Max dose: 7 mg/kg to 500 mg (25 ml 2%, 50 ml 1%)

## Bupivacaine (Marcaine) 0.25%

- Onset: 5 minutes
- Duration: 2 to 4 hours
- Action : anesthesia only
- Max dose: 2.5 mg/kg up to 175 mg (50 ml 0.25%, 25 ml 0.5%)



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# BASIC KNOT TYING

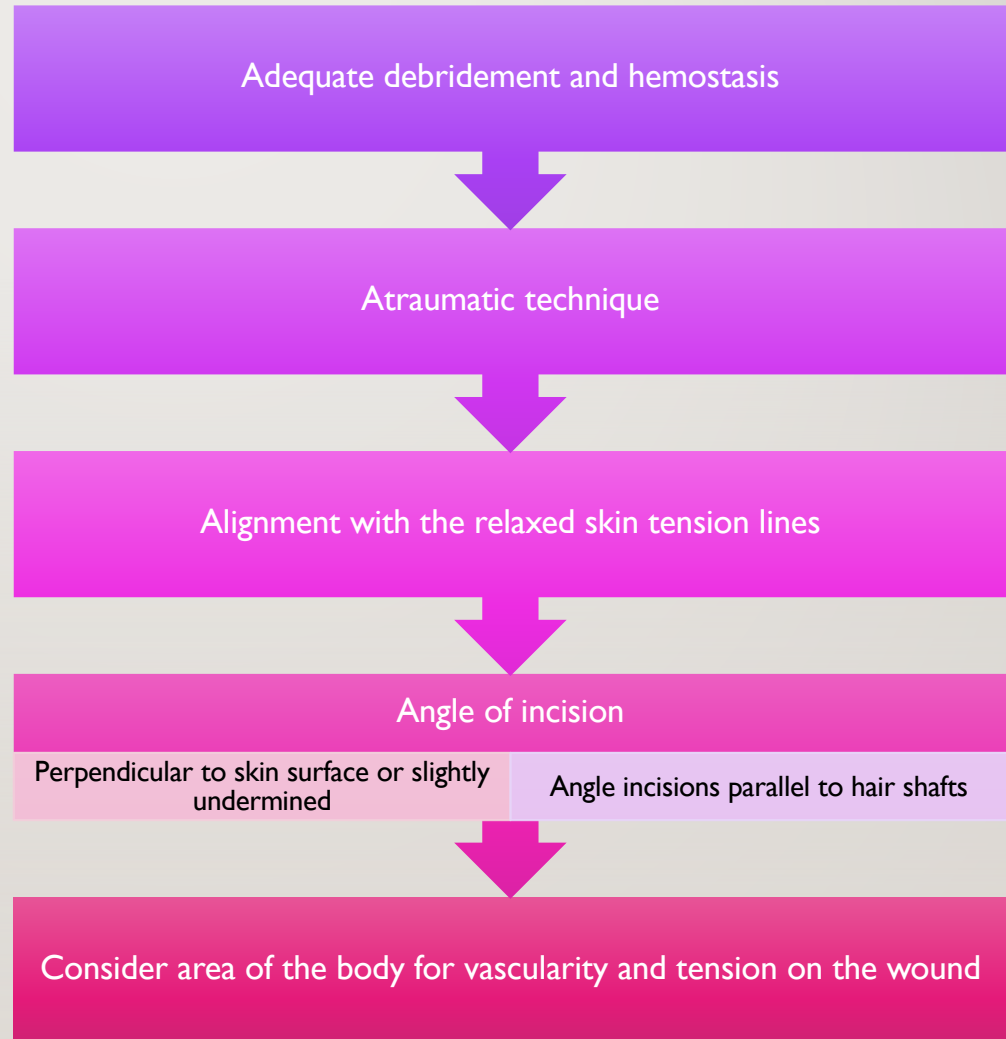
# INSTRUMENT TYING

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# SURGICAL WOUND CLOSURE GUIDELINES



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## KEY TECHNIQUES

Close dead space under the incision

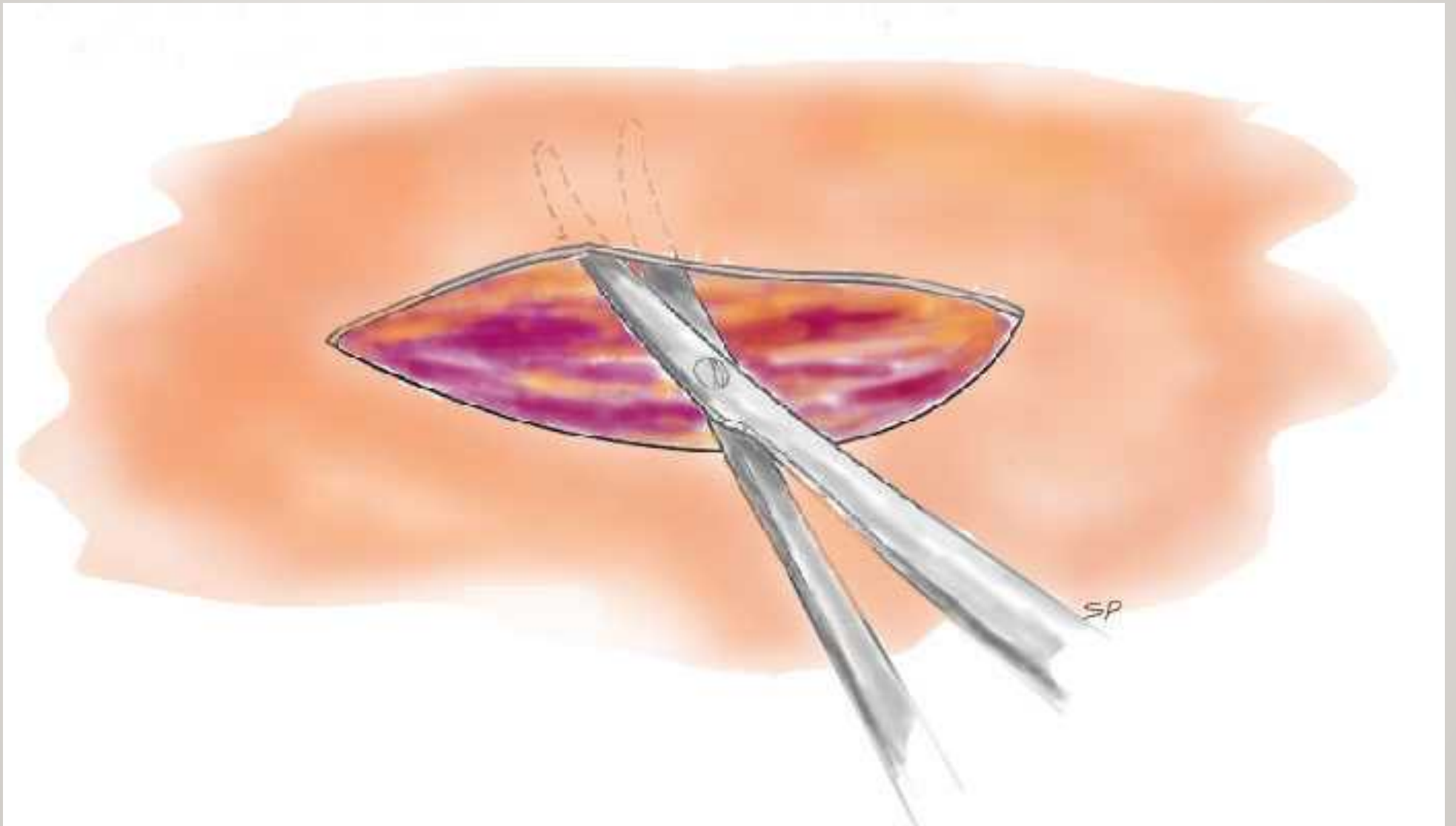
Close the tissue in layers

Carefully align the wound edges

Careful choice of the axis of incision or axis of closure of the donor skin flaps

Correct choice of deep and cutaneous sutures

# Undermining



# BLEEDING

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Control with pressure directly over the wound immediately



Locate the nearest artery and put pressure there to give yourself room to work

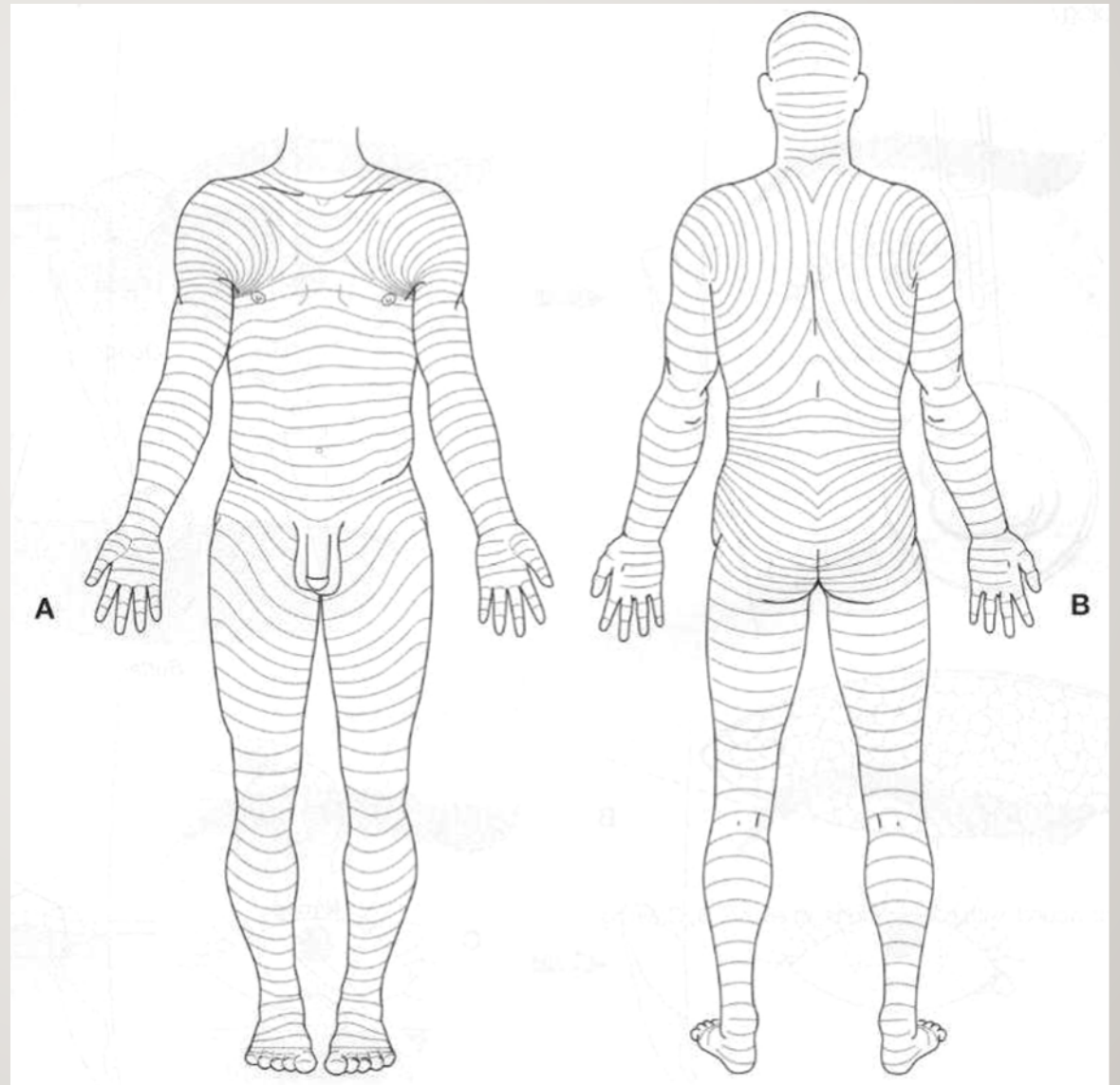
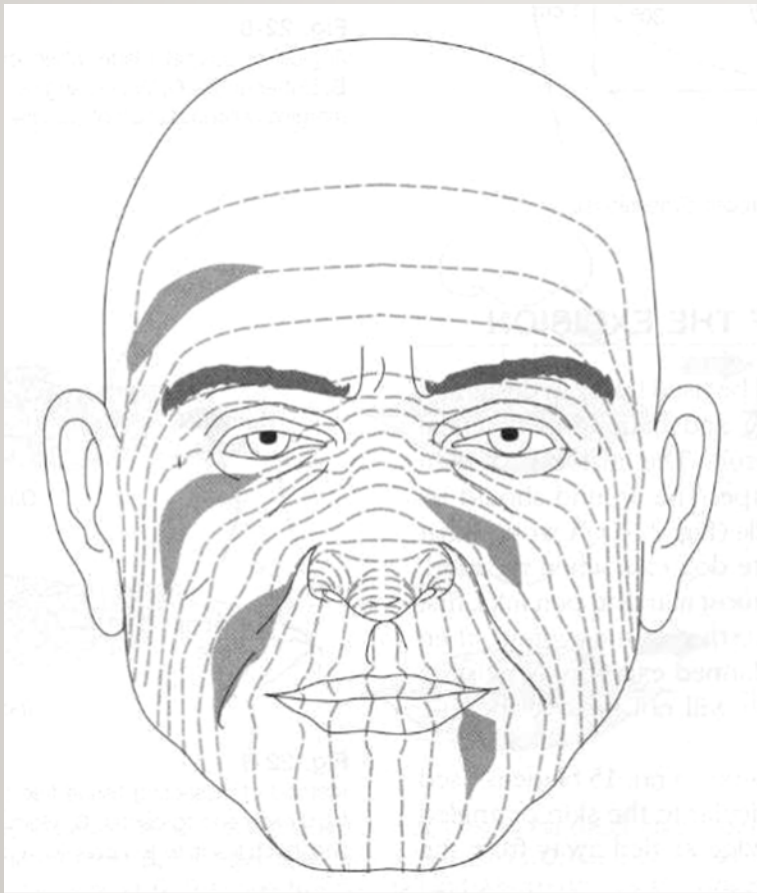


If necessary, tie off the bleeding vessel

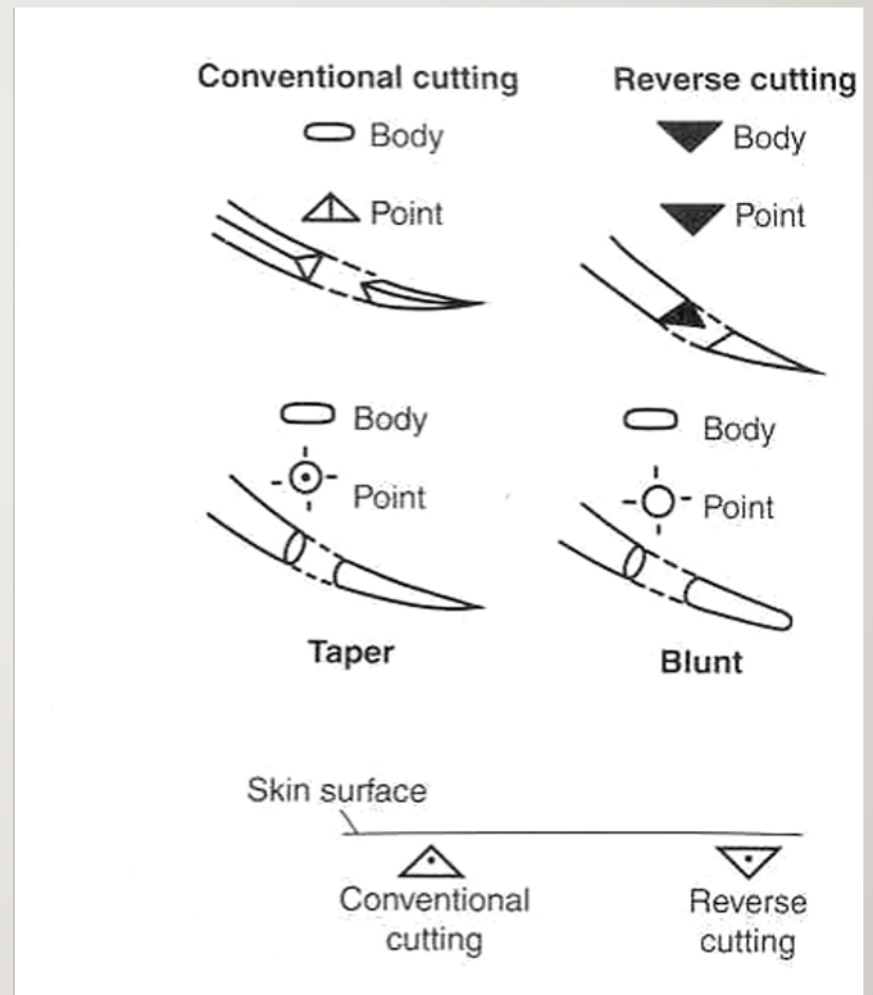
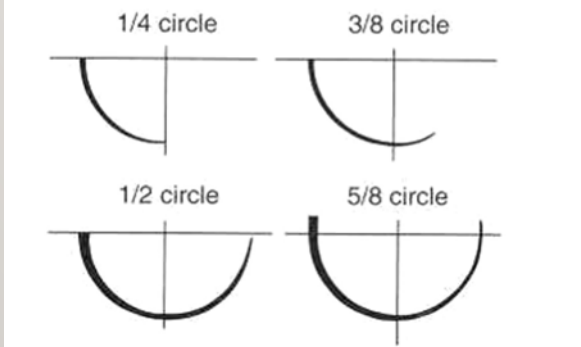
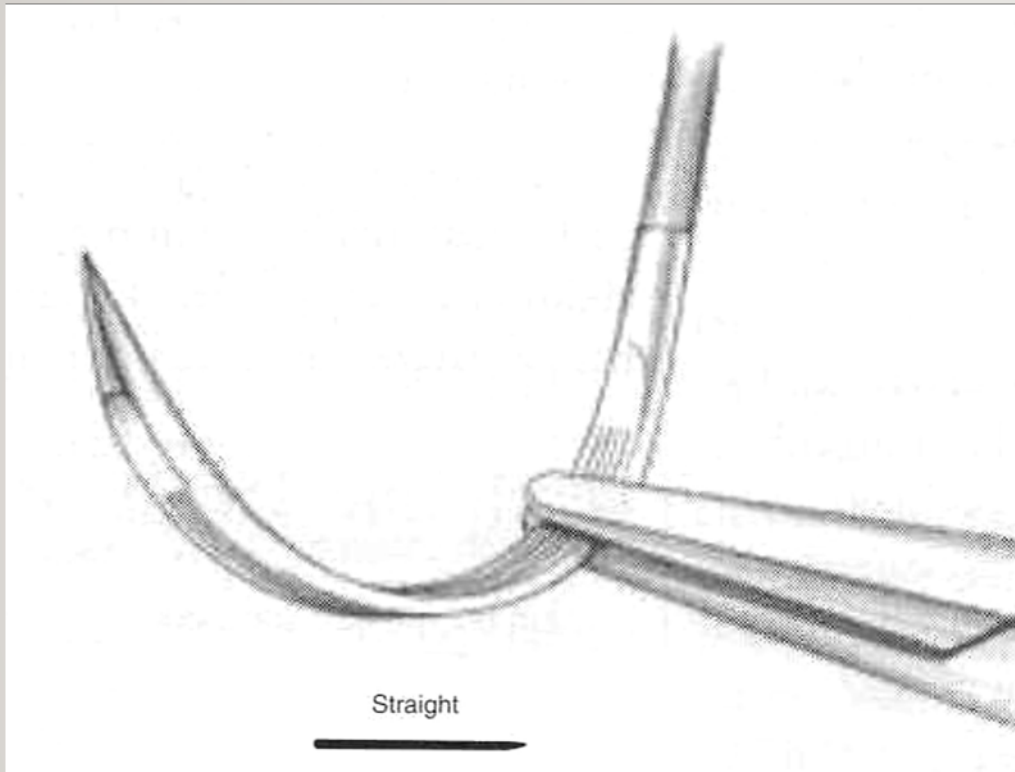


Use a pressure bandage

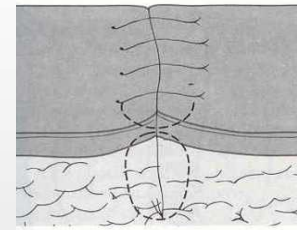
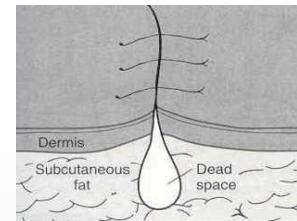
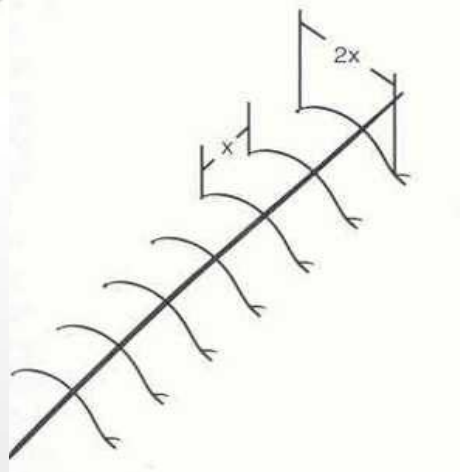
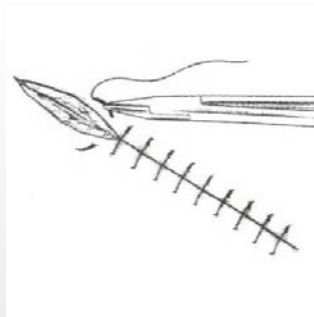
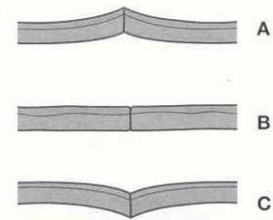
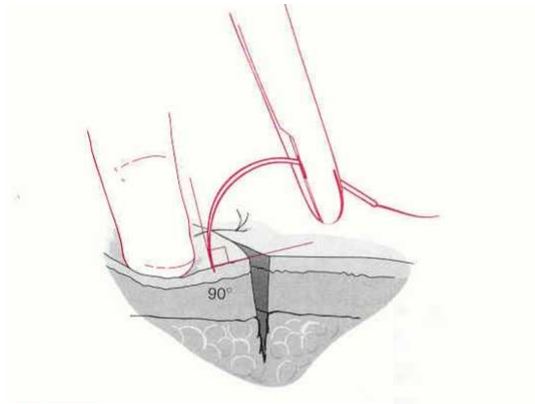
# Tension lines



# All about needles



# Suture technique



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## SIMPLE INTERRUPTED SUTURES

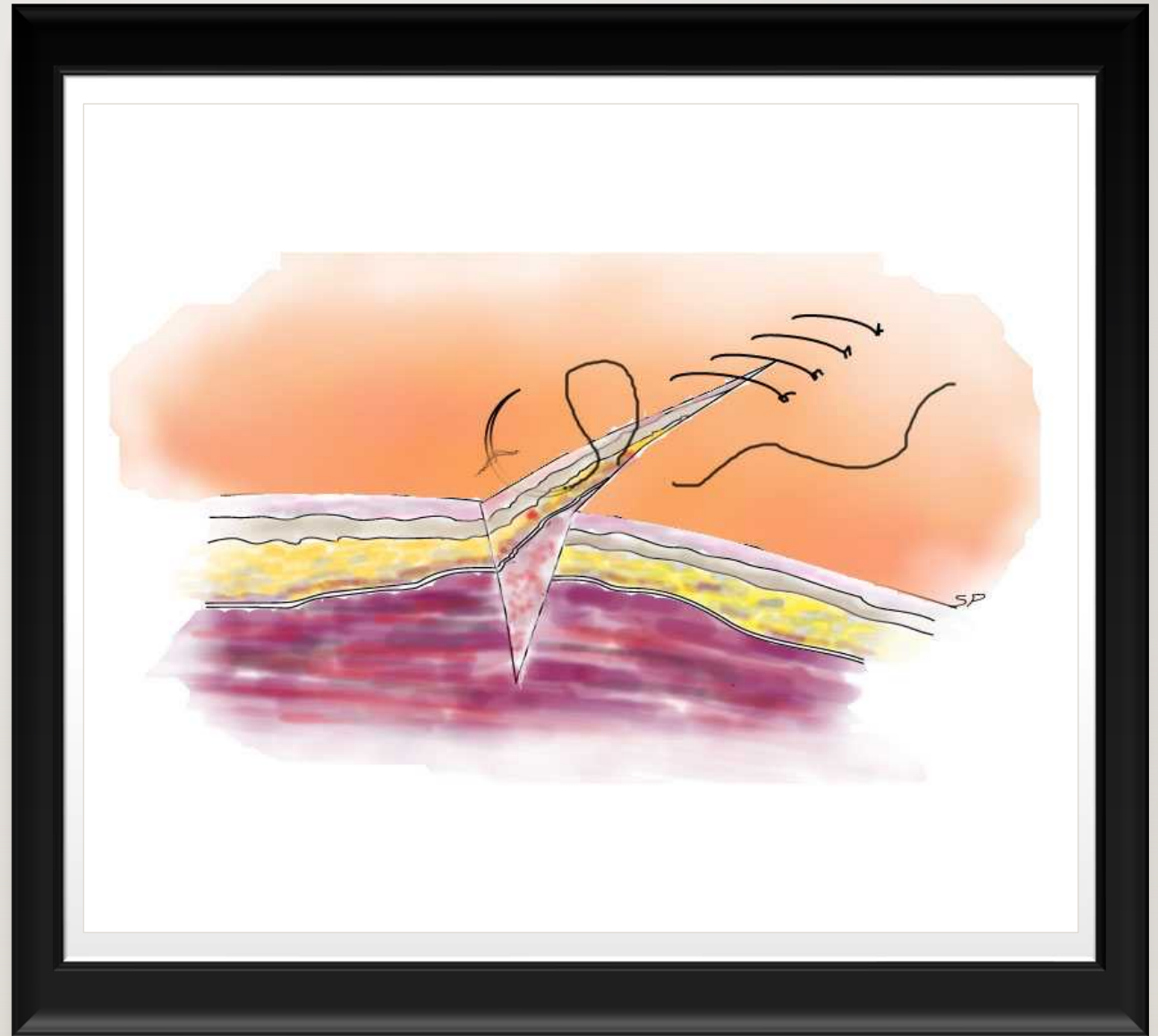
This suture is used for simple laceration closures or closure of office procedures like biopsies or lesion removals

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 sound healing

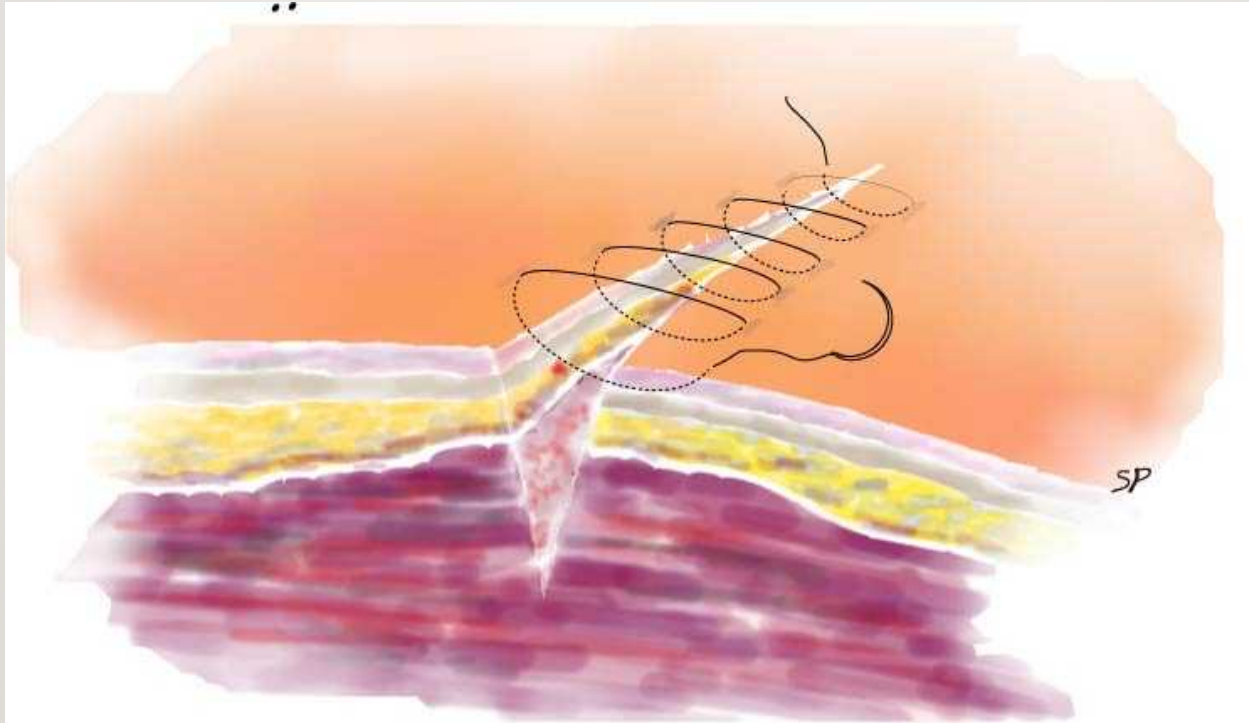
# SIMPLE INTERRUPTED SUTURES

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## 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



## CONTINUOUS SUTURE LINE

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# HORIZONTAL MATTRESS SUTURE

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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



## VERTICAL MATTRESS SUTURES

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# SUB- CUTICULAR CLOSURE

Used for cosmetic closures

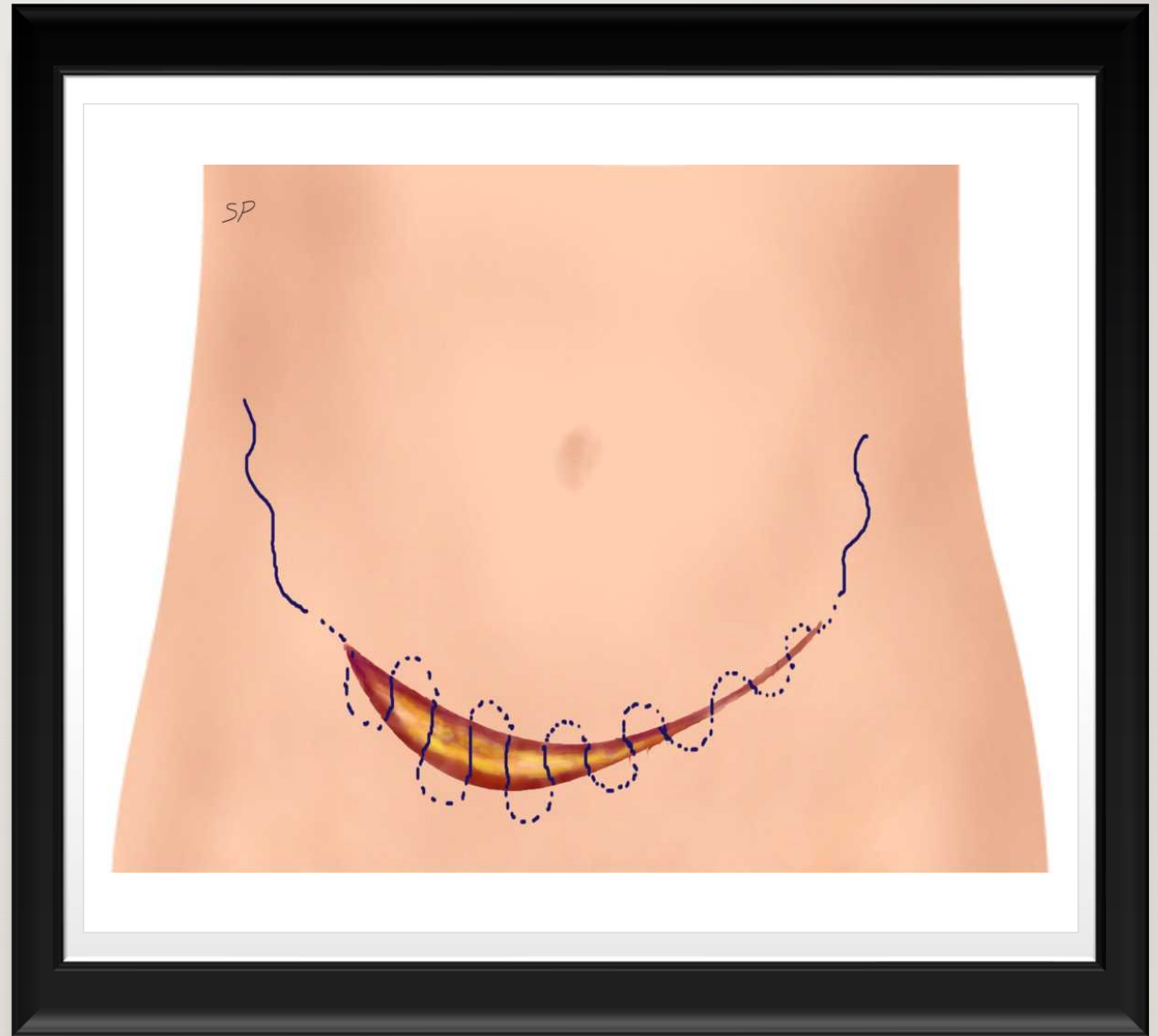
Use an absorbable suture if you plan to leave the sutures in and bury the knots

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

# SUB- CUTICULAR CLOSURE

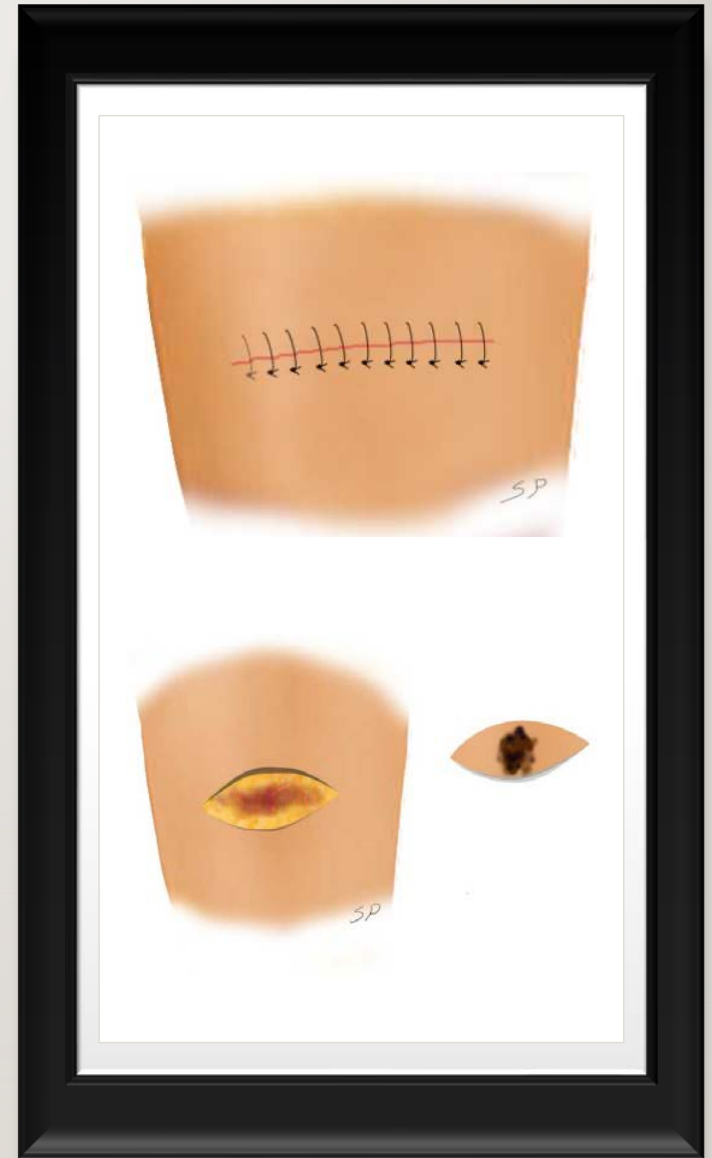
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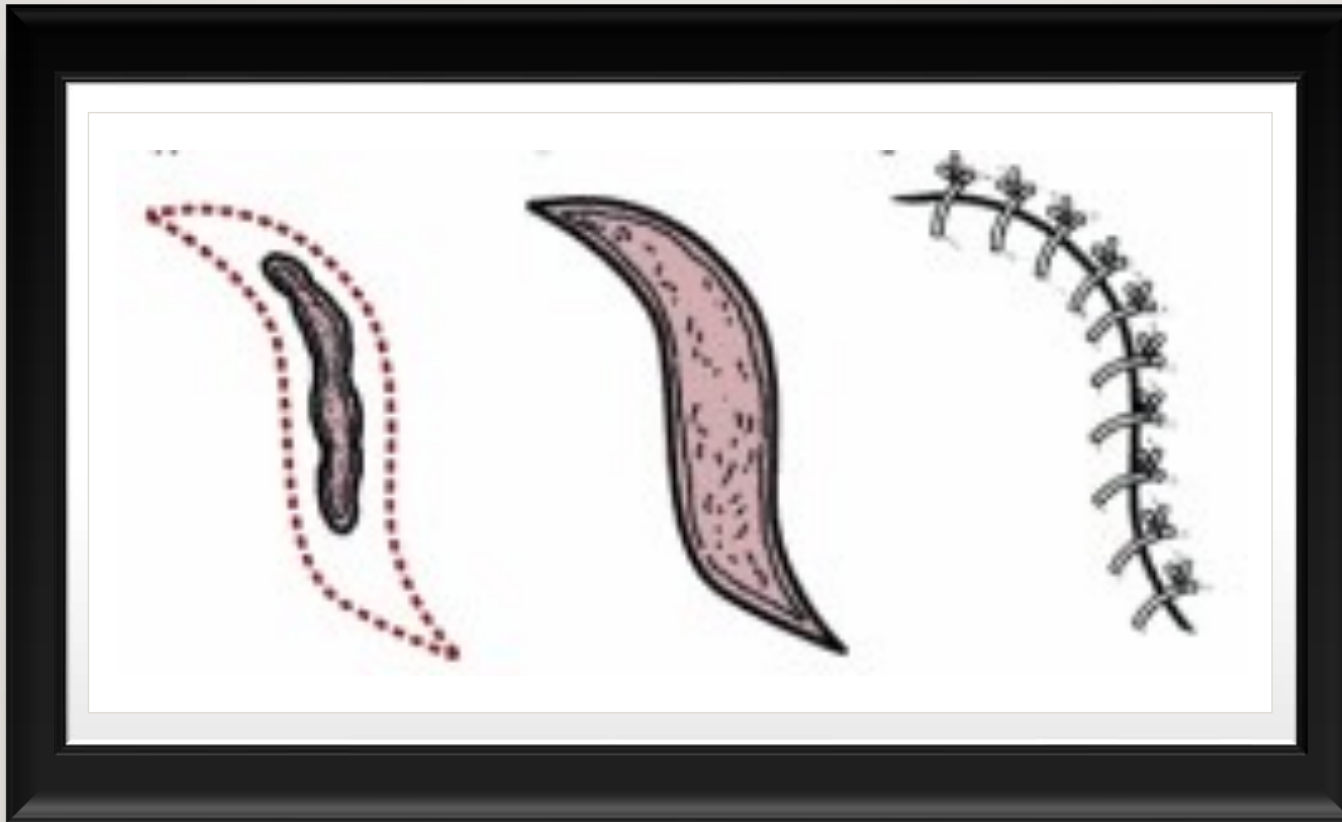


# ELLIPTICAL INCISION

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The ellipse should be three times as long as it is wide. This will make closure of the wound much easier. If the lesion you are removing is likely to be cancerous, make sure that you leave wide margins of clear skin around the lesion.





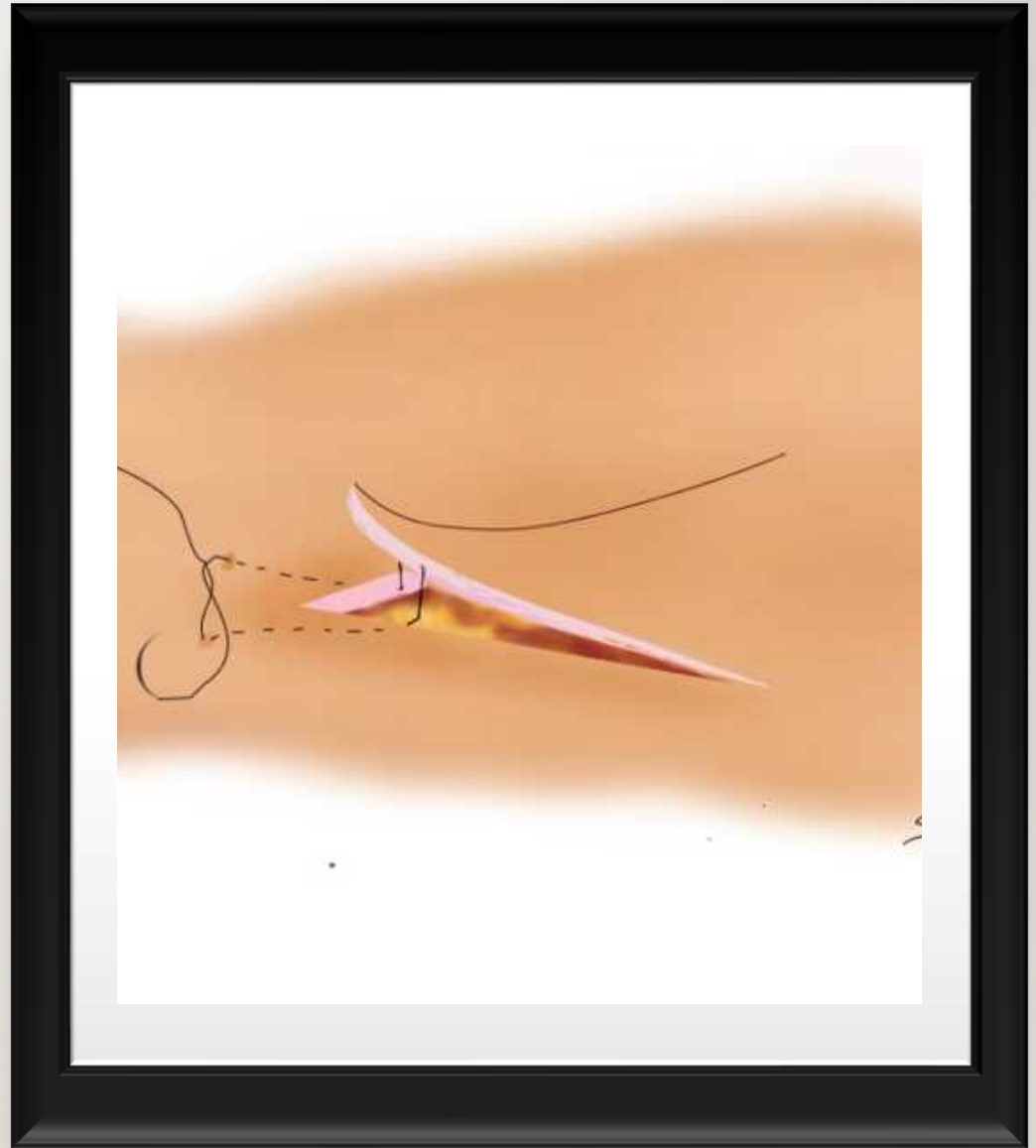
**MODIFIED ELLIPSE.**

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# 3 CORNERED SUTURE

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- Used to close a skin flap which comes to a point
- Helps close the wound, but maintain circulation to the tissue
- Places minimal tension on the wound edges



# SUTURE MATERIALS

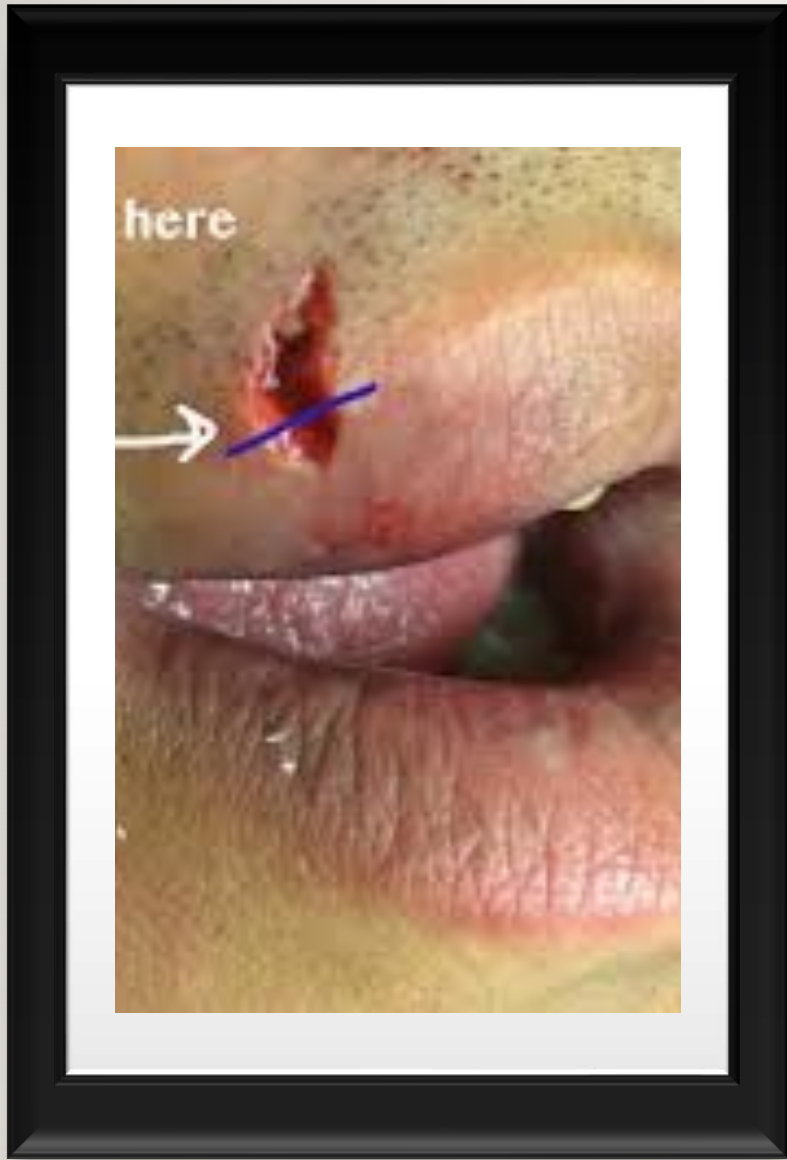
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Suture material	filament	Absorbing properties	Tissue reaction	Tensile strength	Tensile strength retention	cost	Uses
plain gut	collegen	absorbable	moderate	poor	2-4 days	low	Inside the wound where it absorbs and wound healing is quick
chromic gut	collegen	absorbable	moderate	poor	7-10 days	low	Inside the wound where it absorbs and wound healing time is average length
polygalactic acid (Vicryl)	braided	absorbable	mild	poor	2-3 weeks	moderate	Inside the wound where it absorbs and longer wound healing time is required, such as tendons.
silk	braided	Non-absorbable	high	poor	1year	low	Skin closure or fascia
nylon	monofiliment	Non-absorbable	Very low	good	Loses 20%/yr	low	Skin closure or fascia or where long term strength is needed
Polypropylene (Prolene)	monofiliment	Non-absorbable	minimal	excellent	indefinite	high	Sub-cuticular skin closure or fascia or where permanent strength is needed.
Polyester (Mersilene)	braided	Non-absorbable	minimal	good	indefinite	high	Internally where low reaction braided suture is required to allow tissue to adhere to it.
stainless steel	monofiliment	Non-absorbable	low	excellent	indefinite	moderate	Bone , tendons, strong connective tissue where permanent strength is required

# TONGUE LACERATION

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# LIP LACERATION

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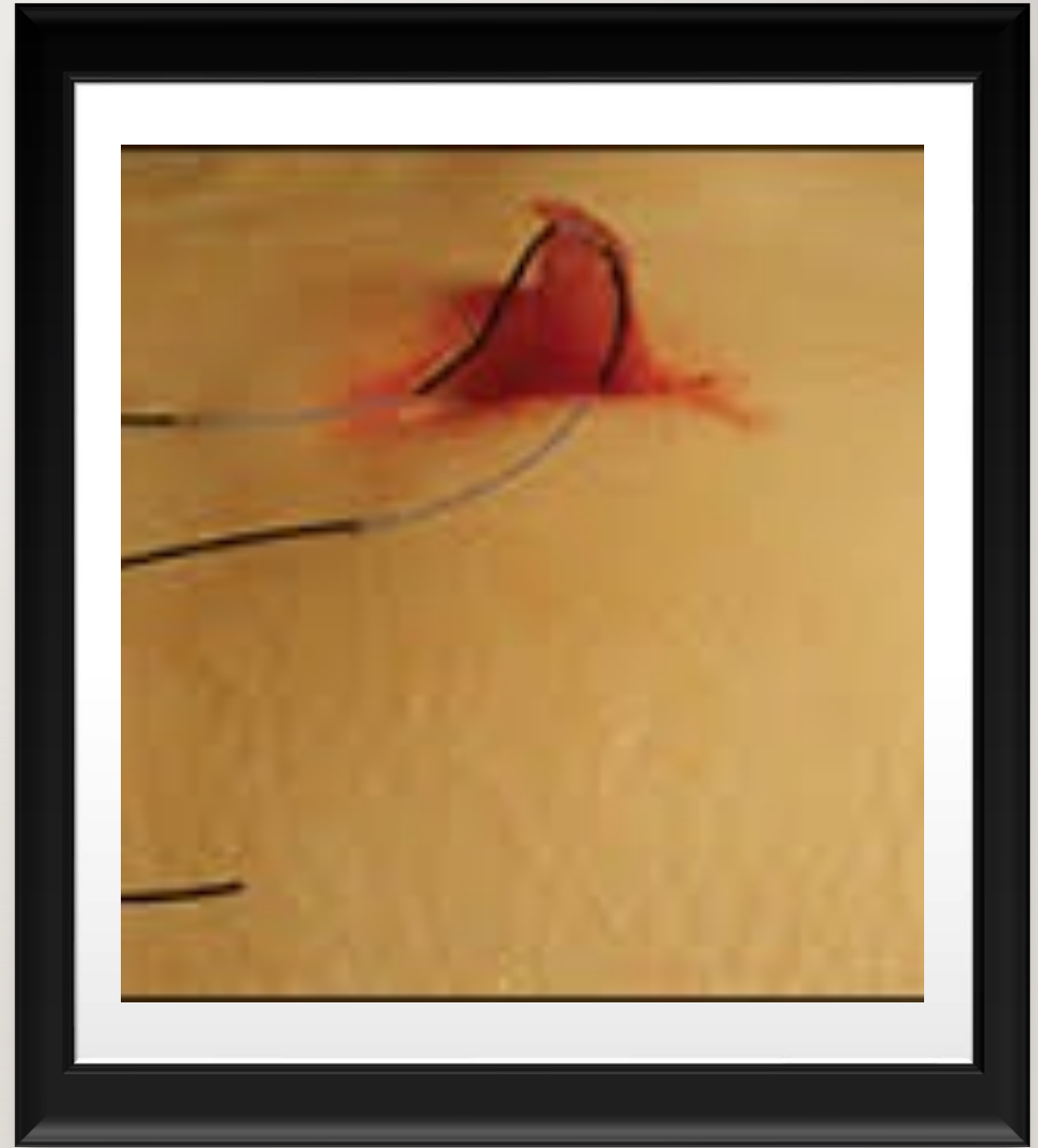
# NAIL LACERATION

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# THREE CORNER TEAR

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# INTERRUPTED SUTURES

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# MATTRESS SUTURES

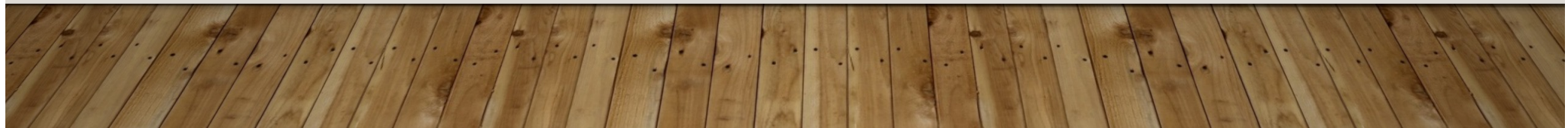
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# IRREGULAR BORDER

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## CONTINUOUS SUTURES

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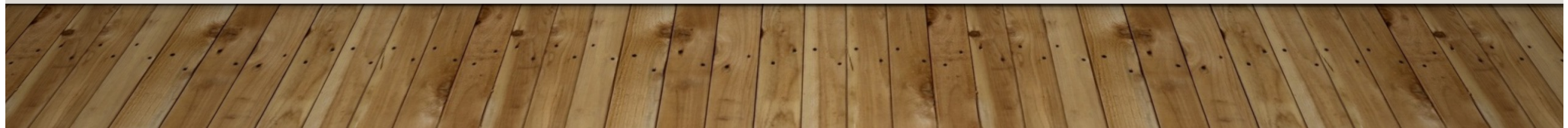
# SKIN TEAR REPAIR





## FOREIGN BODY

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# DOG BITE

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Family Healthcare & Minor Emergency Clinic, Inc

LACERATION # 1 2 3 \_\_\_\_\_

**WOUND DESCRIPTION**

Location: \_\_\_\_\_ Length: \_\_\_\_\_ cm

Depth  superficial  subcutaneous  full-thickness  
 muscle involvement  tendon

Type:  Linear  Irregular  Flap  Curved  Y Shaped

**WOUND PREPARATION**

Wound irrigated with *large volume / approx* \_\_\_\_\_ cc normal saline  
 Wound preparation with:  betadine  wound cleanser

**PROCEDURAL ANALGESIA:**

Sedation / Analgesia with:

Versed \_\_\_\_\_ mg IV / IM / PO / PR  Fentanyl \_\_\_\_\_ mcg IV  
 Ketamine \_\_\_\_\_ mg IV / IM  Morphine \_\_\_\_\_ mg IV/IM

Anesthetic: \_\_\_\_\_ cc of  Lidocaine 1%  2% plain with epinephrine  
 marcaine 0.25%  0.50% plain with epinephrine  
 infiltrated locally  digital block  metacarpal block  
 nerve block

Sterile prep & drape:

Wound explored: foreign material  absent  present → glass/dirt/wood/pebbles/mold  
 removed completely / partially

Skin repaired with: # \_\_\_\_\_ 2-0 3-0 4-0 5-0 6-0 silk/nylon/prolene simple interrupted mattress H/V running  
 # \_\_\_\_\_ staples / dermabond / steri-strips

Sub-Q repaired with: # \_\_\_\_\_ 2-0 3-0 4-0 5-0 6-0 vicryl / chromic / gut simple interrupted mattress H/V running

Muscle repaired with: # \_\_\_\_\_ 2-0 3-0 4-0 5-0 6-0 vicryl / chromic / gut simple interrupted mattress H/V running

Nail bed repaired with: # \_\_\_\_\_ 5-0 6-0 7-0 vicryl / chromic / gut

Wound edge approximation:  good  acceptable  
 Wound edge eversion:  good  acceptable  
 Wound hemostasis:  good  acceptable

Antibiotic ointment & dressing placed

Patient counseled regarding:  wound care instructions  infection risk  foreign body

Patient tolerated procedure:  well  
 adequately  
 poorly

\_\_\_\_\_  
 Practitioner Signature

# DISCHARGE INSTRUCTIONS

- Antibiotic Therapy and for how long
- Wound Care
- Return Visits
- Suture Removal
- Post Suture Removal Care