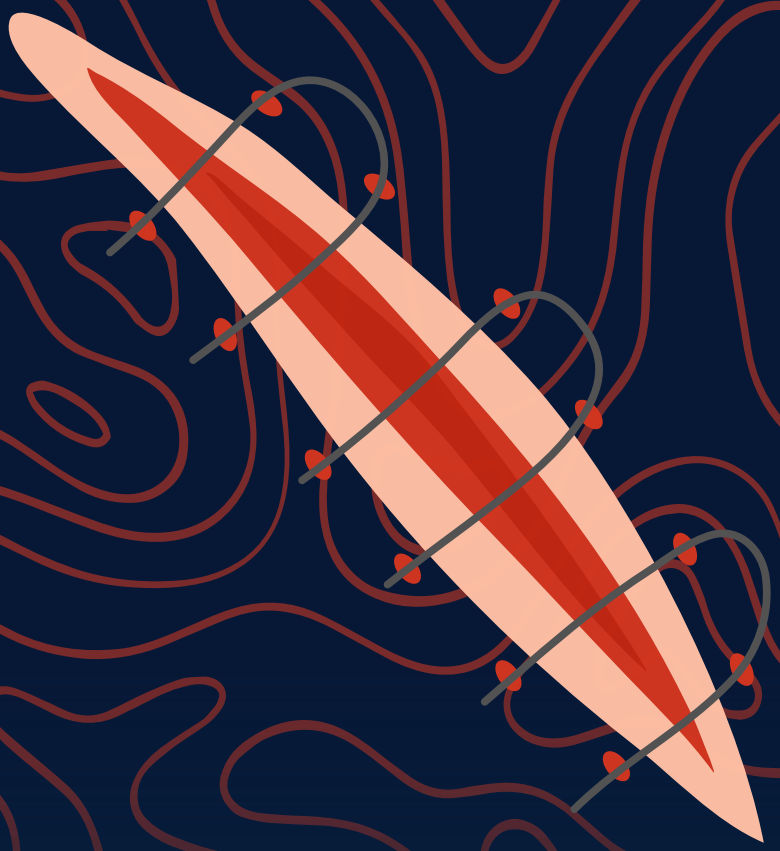
CURRENTS OF CRISIS

INTERNATIONAL TRAUMA CONFERENCE 2025

IMPERIAL COLLEGE SURGICAL SOCIETY

SUTURING HANDBOOK



Contents

Introduction

Purpose of the Guide

This booklet gives you the **essentials** of suturing. It's designed for quick reference during the Trauma Conference or for your own use in clinical rotations. You can use it to build your confidence, refresh your technique, or learn how to suture from scratch!

When to Suture

Not every wound should be closed right away. Suture clean, fresh wounds with good tissue edges. Avoid suturing if there's infection, contamination, or tissue death, as these need cleaning or delayed closure. Trauma wounds vary, so think before you stitch: sometimes less is more.

Suture Materials

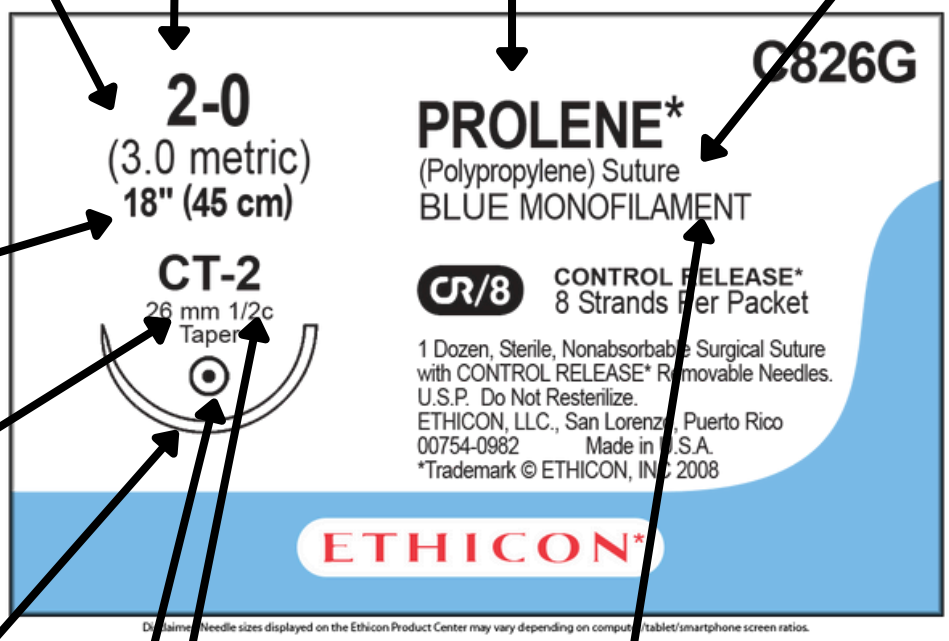
Absorbable vs Non-Absorbable

Absorbable sutures break down naturally over time and are ideal for internal tissues, while non-absorbable suturesremain in place until removed and are typically used for skin closure.

Common Suture Materials

- **Vicryl** – Absorbable
  - Uses: Deep dermal closure, mucosal surfaces, ligating vessels.
  - Notes: Absorbs over ~60–90 days; strong initial tensile strength.
- **Monocryl** – Absorbable
  - Uses: Subcuticular skin closure, low-tension internal layers.
  - Notes: Absorbs faster (~30 days); smooth handling, minimal tissue reaction.
- **Nylon** – Non-absorbable
  - Uses: Skin closure, particularly in areas needing a good cosmetic outcome.
  - Notes: Low tissue reactivity; removed after 5–14 days depending on site.
- **Prolene** – Non-absorbable
  - Uses: Skin, vascular anastomoses, or areas requiring long-term strength.
  - Notes: High tensile strength, minimal reactivity; often used in sterile, moist environments.

How to read a suture packet



US Gauge

Metric Gauge

Brand Name of the Suture

Suture Material

Suture Length

Needle Length

Image of the needle

Needle type

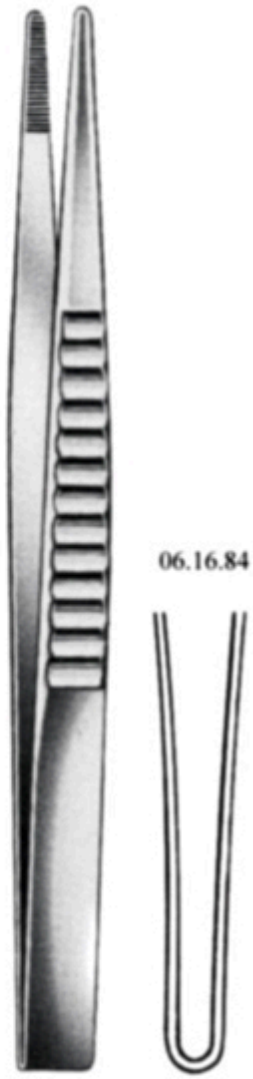
Needle Shape

Monofilament sutures are a single strand, offering smooth tissue passage and lower infection risk, but potentially weaker knot security.

Polyfilament sutures, composed of multiple intertwined strands, provide better knot security and ease of handling, but may harbour bacteria more easily

Instruments

Non-Toothed Forceps:
Used for handling delicate tissues without causing damage. They are specifically designed with atraumatic grasping surfaces, often serrated or grooved, to provide a secure hold on tissues like vessels, nerves, and bowel, reducing the risk of tearing or crushing.



Toothed Forceps:
Used for grasping, retracting, or stabilising tissue during surgical procedures. Their toothed design allows for a secure grip on various tissues, including skin, subcutaneous fat, fascia, muscle, and tendons. These forceps are particularly useful when a firm hold is needed, reducing the risk of slippage and minimising the force required from the surgeon's hand.

Instruments

Needle Holder

Used to securely hold and manipulate suturing needles during surgical procedures.

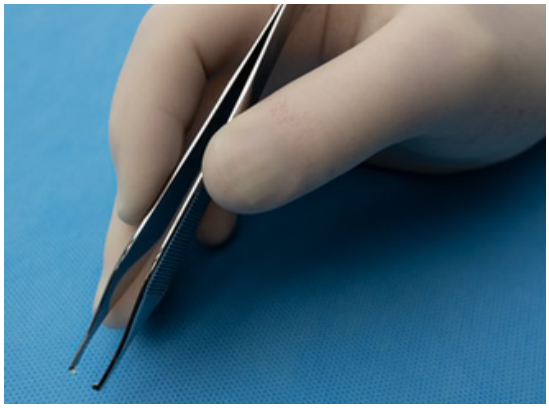
Scissors

They are specialised instruments used for **cutting tissue, sutures, and dressings** during surgical procedures. They come in various types, each designed for specific tasks, such as cutting delicate tissues, sutures, or even heavier tissues like fascia.

Scalpel

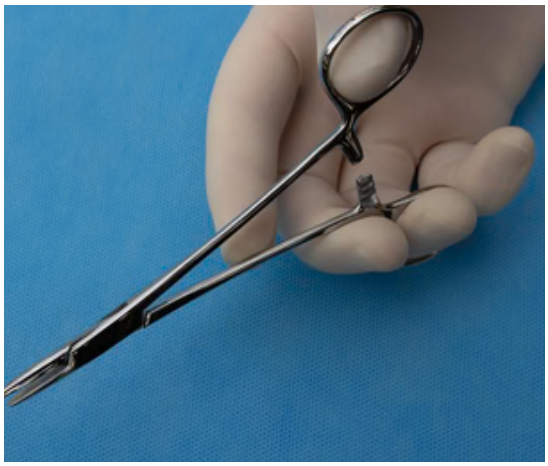
In suturing, scalpels are primarily used to create precise incisions for accessing the underlying tissue that needs to be repaired. They are crucial for making clean, controlled cuts, allowing surgeons to accurately place sutures and achieve proper wound closure.

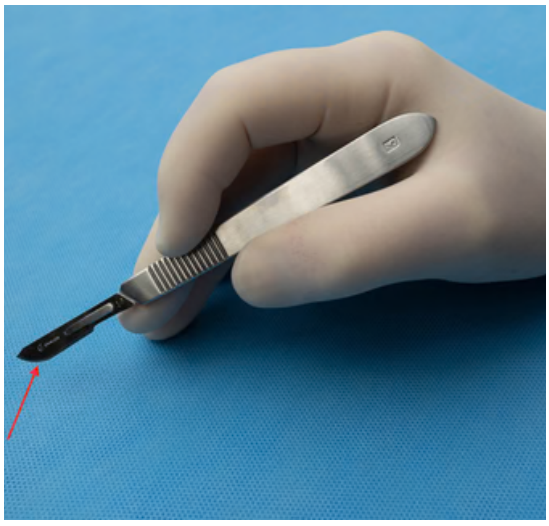
How to Hold your Instruments



Hold the forceps in your non-dominant hand like a pencil, near the tip, for precision. Use them gently to stabilise, evert the wound edges, and avoid crushing tissue. Only grip the dermis, not the epidermis, to minimise trauma and scarring.

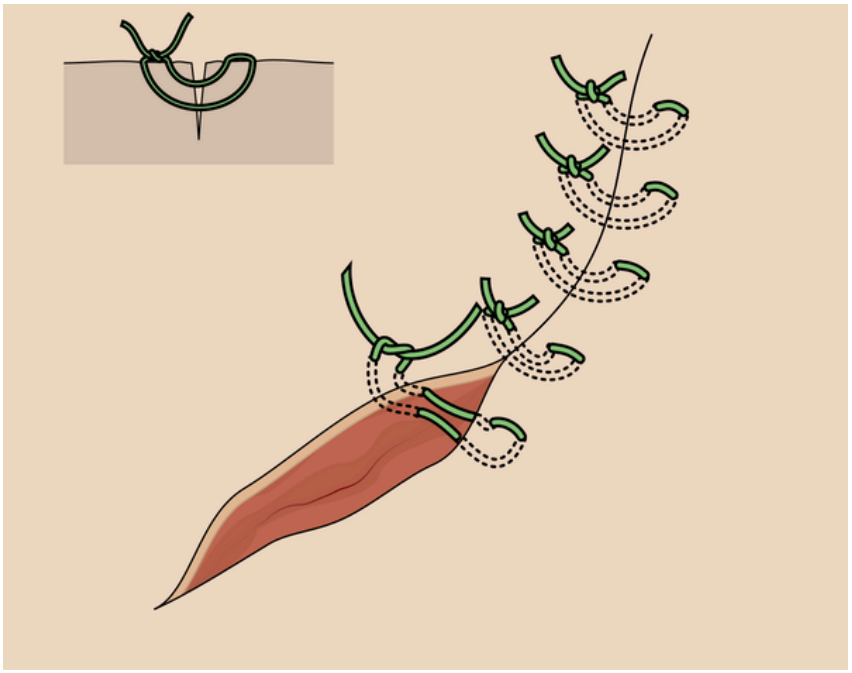
Grip the needle driver in your dominant hand using a tripod grip (thumb and ring finger in the rings, index finger resting along the shaft). This gives control for driving the needle smoothly through tissue. Lock and unlock with minimal wrist movement to stay steady and reduce hand fatigue.





When suturing, the scalpel should be held using a modified pencil grip, offering control and precision. The scalpel is held between the thumb and index finger, similar to how one would hold a pencil, with the blade resting against the tissue. The index finger can be placed along the side of the blade for added stability and control.

Simple Interrupted

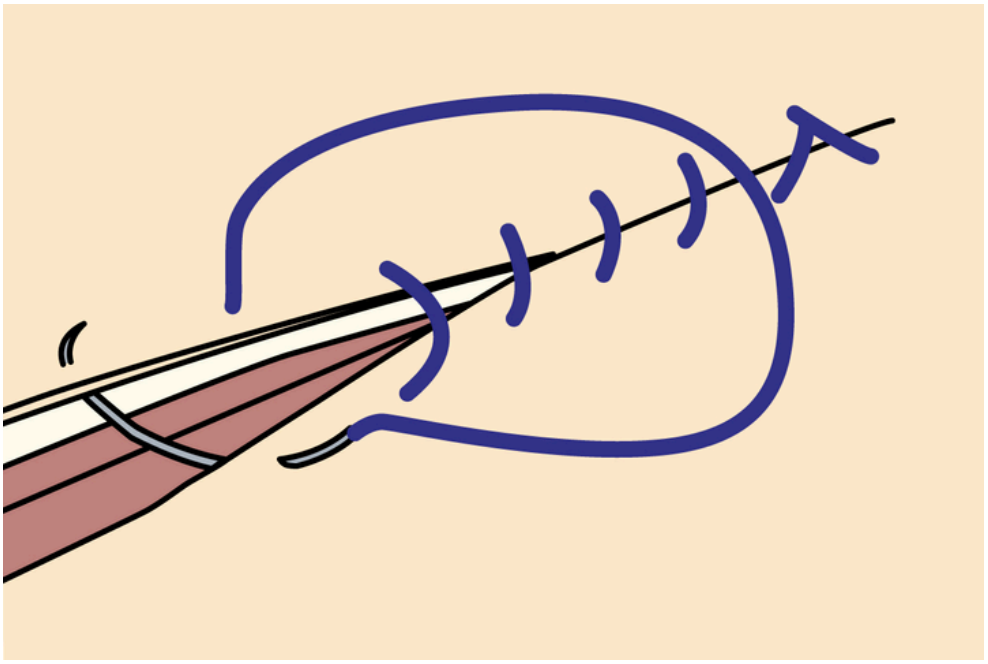


Purpose: Basic, versatile suture for skin closure.

Steps:

1. Load the needle about two-thirds from the tip using the needle driver.
2. Use the forceps to gently evert the wound edge.
3. Insert the needle 3–5 mm from the wound edge at 90°.
4. Pass the needle through to the opposite side, exiting the same distance from the edge.
5. Pull the suture through, leaving a 3–4 cm tail.
6. Tie a square knot (3–4 throws).
7. Cut the ends, leaving ~1 cm

Continuous

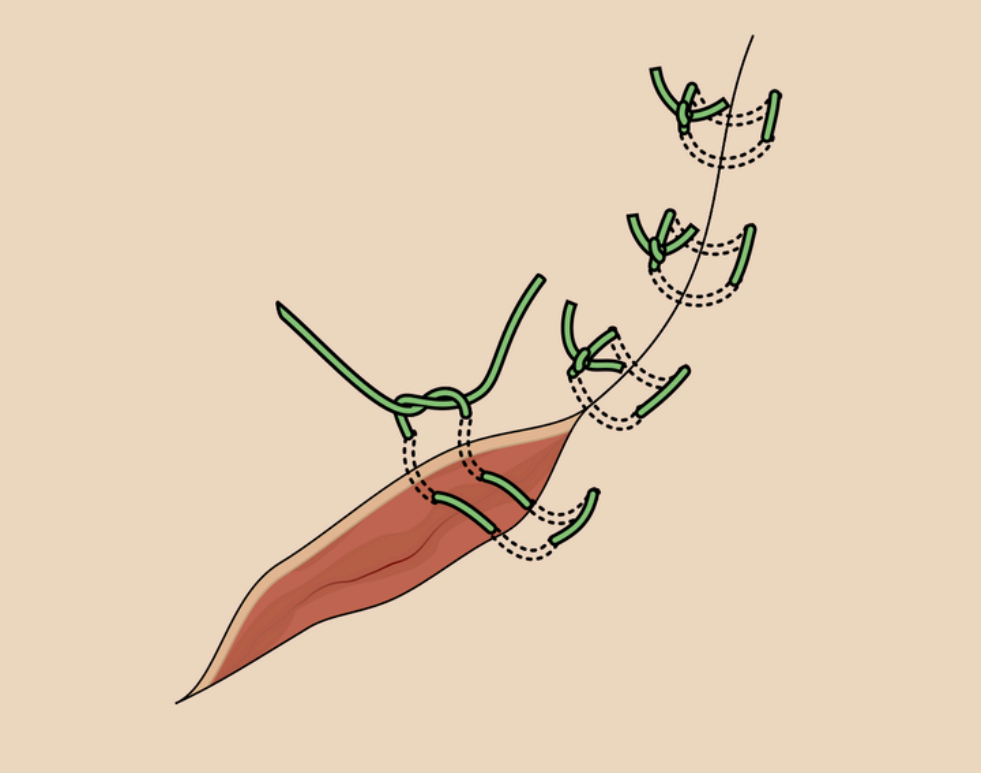


Purpose: Fast closure of long, low-tension wounds.

Steps:

1. Start with a simple suture at one end of the wound and tie it off, leaving a tail.
2. Without cutting the thread, reinsert the needle about 3–5 mm from the edge and continue to the opposite side.
3. Repeat evenly spaced bites along the wound, maintaining slight tension.
4. At the end, tie off the final stitch with the tail from the starting knot (or a loop you create).
5. Cut the excess suture.

Horizontal Mattress

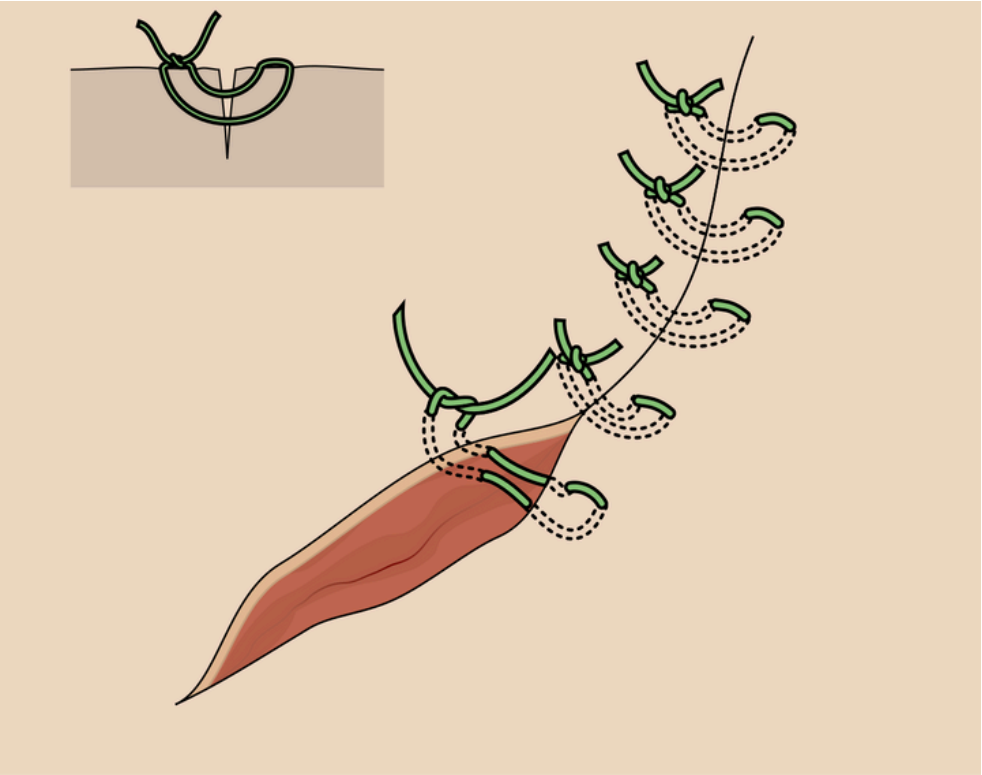


Purpose: Spreads tension across the wound; good for fragile or high-tension skin.

Steps:

1. Insert the needle 5 mm from the wound edge and exit opposite side.
2. Re-enter the skin on the same side (but 5 mm along the wound line) and pass back across.
3. You've now made a rectangular "loop" across the wound.
4. Tie your knot on the same side you started.
5. Cut the ends.

Vertical Mattress

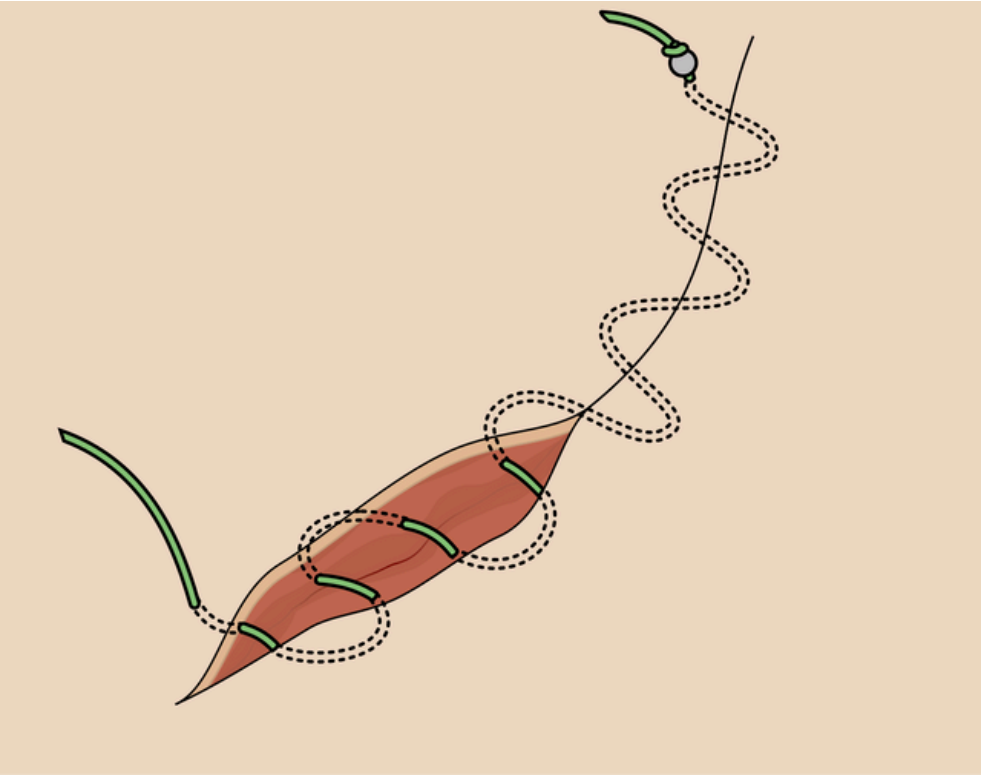


Purpose: Good for everting wound edges; ideal for deeper wounds under tension.

Steps:

1. Insert the needle 5–8 mm from the wound edge, at 90°, and pass deep into the opposite side (deep, far-far).
2. Re-enter the skin 1–2 mm from the wound edge on the same side and pass it across shallowly (near-near).
3. Pull the thread through, ensuring the wound edges evert.
4. Tie a knot on the side where the suture began.
5. Cut ends as normal.

Continuous Subcuticular

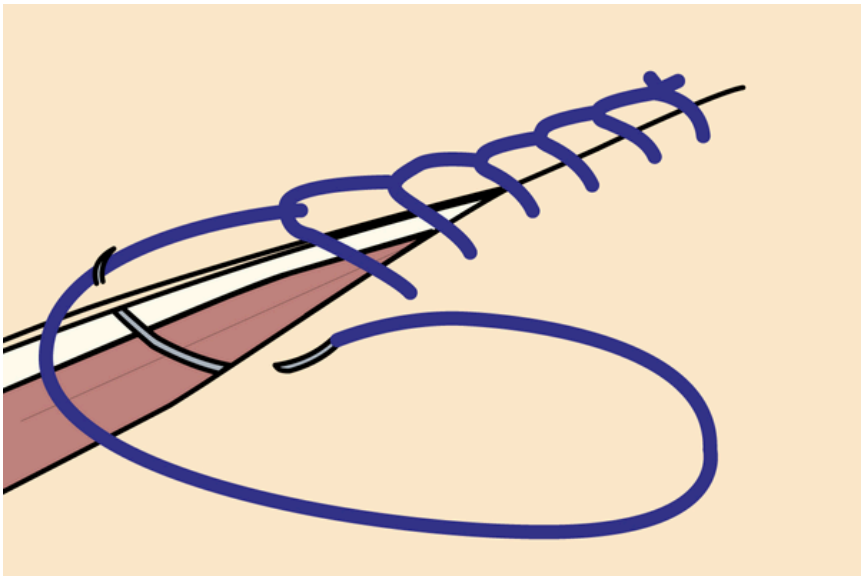


Purpose: Cosmetic closure of clean, low-tension wounds—often on the face or trunk.

Steps:

1. Start with a buried knot just below the dermis at one end of the wound.
2. Use a side-to-side, horizontal motion to pass the needle through the dermal layer only, alternating sides.
3. Keep all suture material within the skin—avoid coming out to the surface.
4. End with a buried knot or secure with Steri-Strips if using Monocryl.
5. No visible sutures should be seen externally.

Locking Suture



Purpose: Adds extra hemostasis and strength to continuous sutures—commonly used for scalp or bleeding areas.

Steps:

1. Start with a simple interrupted stitch at one end of the wound and tie a knot, leaving a tail.
2. Begin a continuous suture by taking a normal bite across the wound.
3. Before pulling the suture tight, pass the needle under the loop of the suture you just created—this “locks” the stitch.
4. Continue with the same pattern: bite across the wound, pass needle under the loop, then tighten.
5. Keep tension even as you go to prevent puckering.
6. At the end, tie off with a knot, securing it to the last loop.
7. Cut the ends.

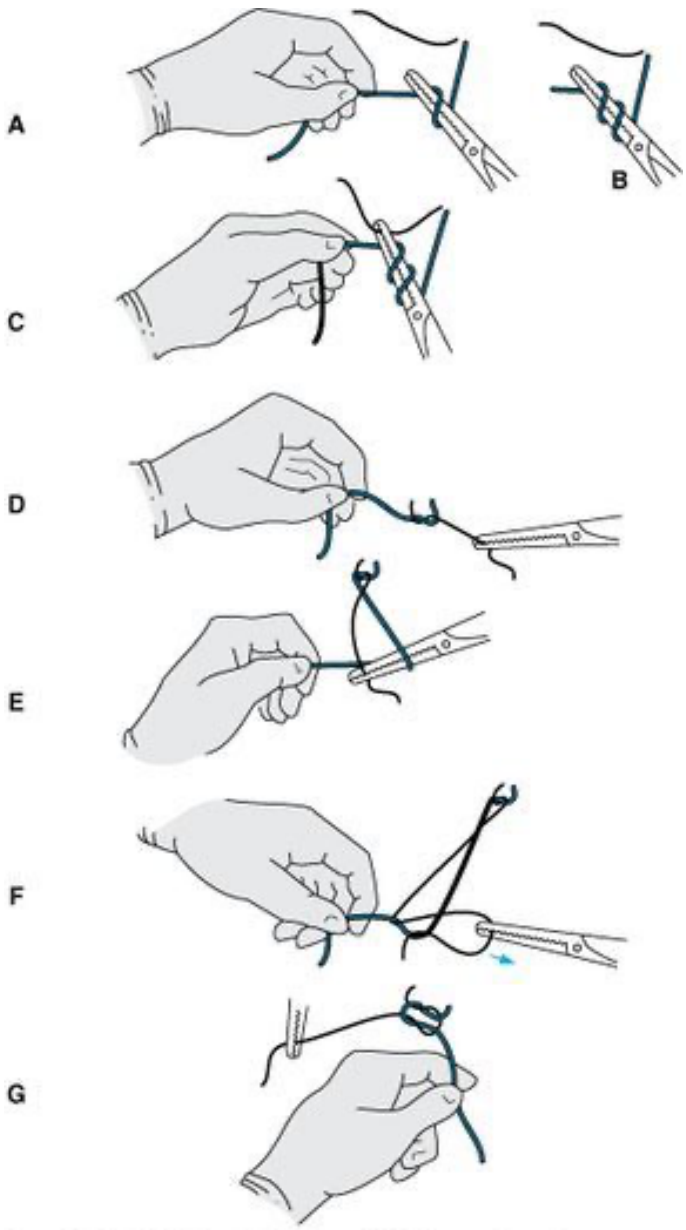
Surgeon's Knot

(Instrument Tie)

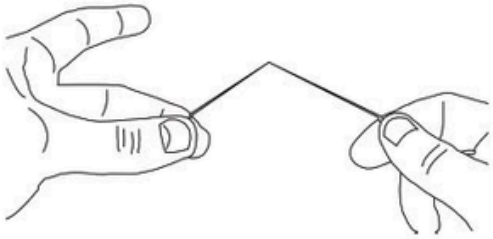
Purpose: A more secure knot that resists loosening. It's especially useful when there's tension in the tissue.

Steps:

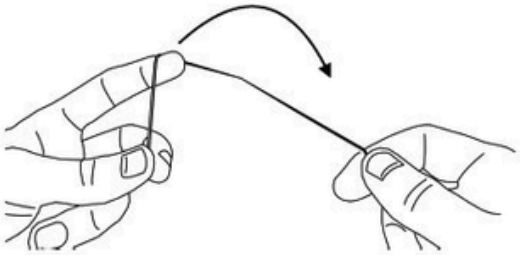
1. Hold the needle driver in your dominant hand and the suture in your non-dominant hand.
2. Cross the long (needle) end of the suture over the short tail.
3. Wrap the long end twice around the needle driver (this is the surgeon's knot—extra friction).
4. Grasp the short tail with the needle driver and pull it through the loops.
5. Tighten the first throw down to the tissue gently.
6. For the second throw, wrap the long end once in the opposite direction and pull through.
7. Repeat with one or two more single throws, alternating direction, to secure.
8. Cut ends to ~1 cm.



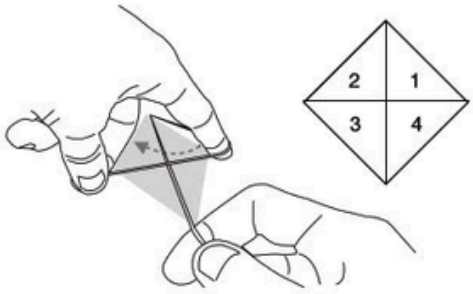
Hand Tie



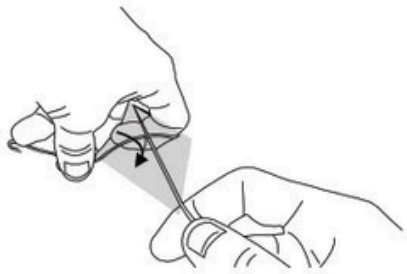
"The mountain"
Start with even lengths. Hold suture between fingers **L1** and **L3**. Keep right hand tight and steady throughout.



"The mountain"
Make the mountain, and bring it over to make a cross ("The kite").

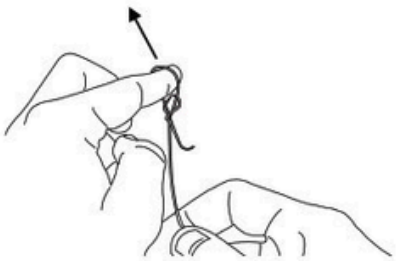


"The kite"
With left hand crossing over right, make a kite with 4 quadrants. **L2** will move from quadrant 1 to quadrant 2, going underneath.

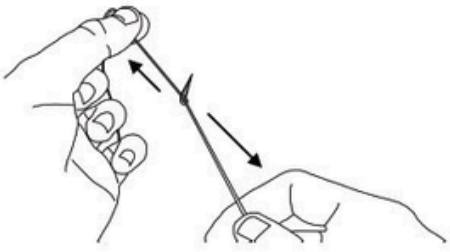


Now move **L2** into quadrant 3, by going over.

"The pull"
With the nail of **L2** pull the suture up and through the loop.



"The pull cont."
Let go with your left hand, and keep pulling the suture through the loop. Then catch it again with **L1** and **L2**.



Now pull your hands away from each other to tighten the throw. Make sure the knot lies flat (check pull direction).

Continued on page 2.

Helpful Resources

QR code to a video demonstration of the different sutures and knot tying techniques

[Link to the video]