Needles, Knots, and Sutures Simulation

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Materials Needed

- Knot-tying board
- Rope
- Needle drivers
- Multifilament suture with large needles
- Beef tongue or chicken breast
- Scalpel
- Tissue forceps
- Suture scissors
- Surgical gloves
Laboratory

1. A commercially available knot-tying board can be used with a rope to teach knot-tying techniques.

2. Beef tongue or chicken breast suturing model
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a. Create three incisions on the meat model with a scalpel.

b. Appropriately load the needle and demonstrate proper needle handling techniques. Use the needle driver and tissue forceps to manually load the needle. Do NOT pick up the needle with your hand.

Image courtesy of Angela Chaudhari, MD
c. Interrupted suture:

- Needle is placed at right angle to skin
- Needle passed to depth of tissue defect
- Needle passed through to other side of skin and secured with forceps or needle holder
- Remove needle following the curve of the needle
- Keep the needle within the field to maintain sterility
- Repeat until the first incision is closed

Image courtesy of Angela Chaudhari, MD
d. Running continuous suture:
   - Simple suture placed and knot tied
   - Simple suture is placed horizontal to the first
   - Slack is removed from the suture
   - Continued until the defect is closed
   - Knot tied with loop of suture when defect is closed

![Image of running continuous suture](image1)

Image courtesy of Angela Chaudhari, MD

e. Running locked suture:
   - Simple suture placed and knot tied
   - Simple suture is placed horizontal to the first, incorporating the suture in the simple suture
   - Slack is removed from the suture
   - Continued until the defect is closed
   - Knot tied with loop of suture when defect is closed

![Image of running locked suture](image2)

Image courtesy of Angela Chaudhari, MD
f. Subcuticular suture

- Anchor knot placed and tied
- Deep to superficial throw at the apex taken, exiting just below the epidermis
- Defect is closed horizontally. Using tissue forceps, expose the junction of the dermis and the epidermis and begin each throw parallel to the skin exactly opposite to where previously exited
- Slack is removed from the suture
- Continued until defect is closed
- Knot tied with loop of suture using three French knots followed by pull through
- Knot buried under skin

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