Basic Suturing for Rodent Wound Closure

Division of Laboratory Animal Resources

Appropriate Wound Closure

Important to avoid problems such as:

Infection

Dehiscence

Wound Coming Apart

Select the Proper Suture Material

- ✓Suture material
- ✓Suture needles
- ✓Suture pattern

Tying Proper Secure Square Knots

Definition of Square Knot:

- ✓ Symmetrical knot
- ✓ Does not slip after tying
- ✓ Made by passing one end of suture over and around another first in one direction, then in the opposite direction

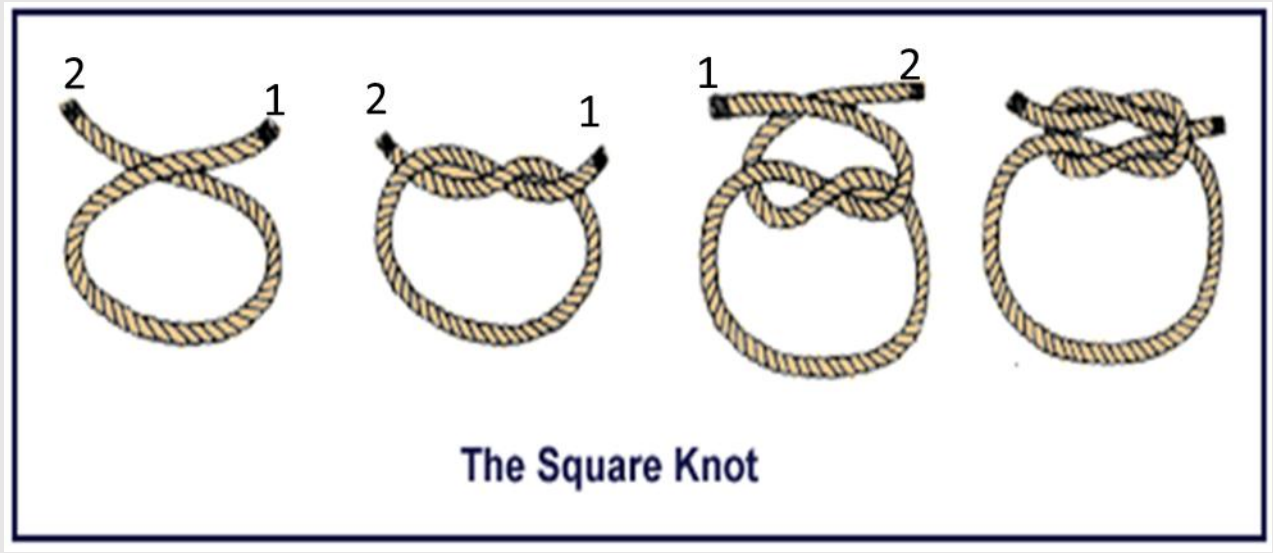
Illustrations for Tying Proper Square Knots

A. Left (1) over Right (2)

B. Loop (1) over (2) pull slack not to tight

C. Cross (1) back over (2)

D. Loop (1) over (2) pull Knot taut



Non-Secure Knots

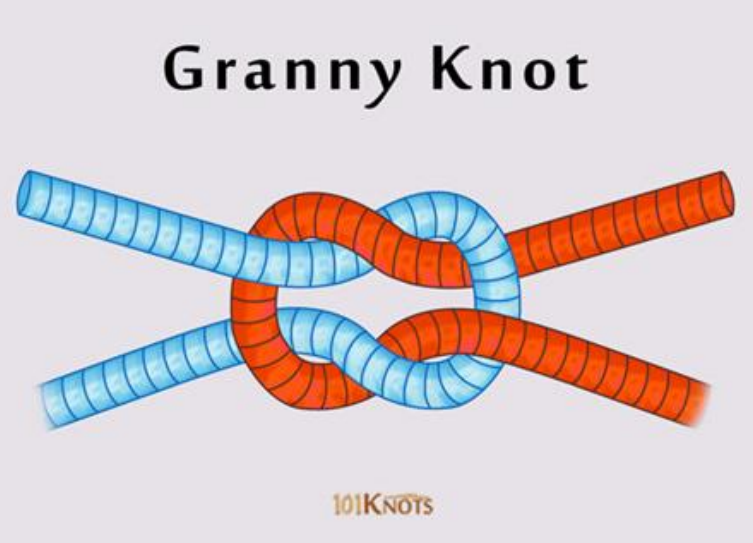
Definition of a Non-Secure Knot:

- ✓ Knots that will fail or will not hold tissue together

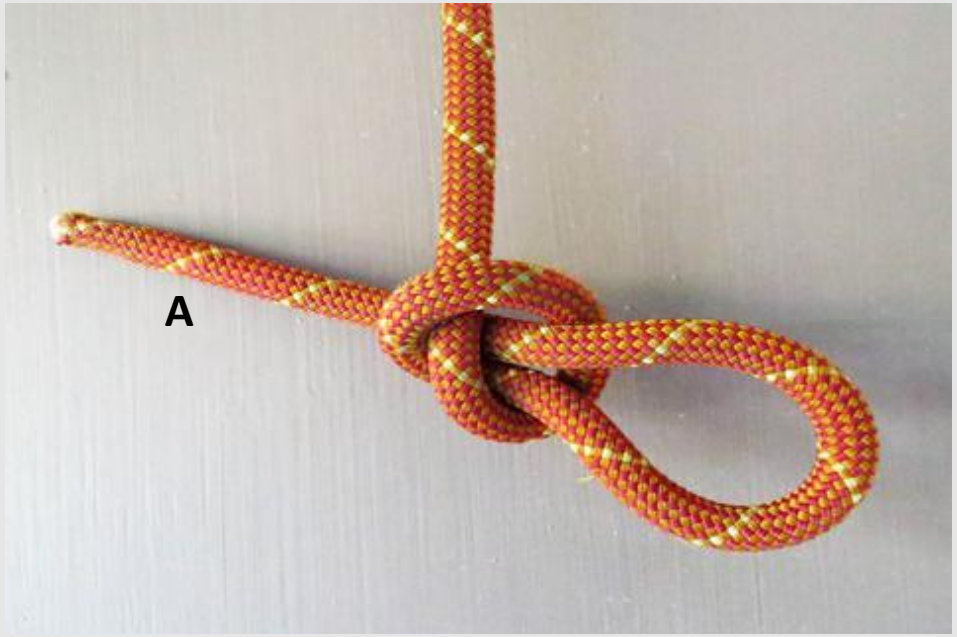
Asymmetrical knots:

- ✓ Granny Knots

- ✓ Slip Knots / Half Hitch Knots



Illustrations of Non-Secure Knots



Slip knot: Pull on Line A and the knot will come untied

Half Hitch

Types of Suture Material

Absorbable

- Used to tie off vessels and close tissue other than skin
  - Examples: Vicryl; Dexon; PDS; Maxon

Nonabsorbable

- Used to close skin
  - Examples: Prolene; Nylon, Silk

Other Types of Wound Closure Material

Wound Clips / Surgical Staples

Surgical Glue
(vetbond; nexaband)

Suture Pattern: Simple Interrupted

Each suture is placed with a separate piece of material

Advantages:

- ✓ Allows adjustment of tension throughout the suture line
- ✓ Failure of one knot will not affect the incision suture line
- ✓ More Secure

Disadvantages:

- ✓ More time to tie individual knots
- ✓ More Suture Material is often used
- ✓ More foreign material is placed in the incision site

Suture Pattern: Simple Interrupted Example

Suture Patterns: Simple Continuous

Suture is placed with a continuous, uninterrupted length of material

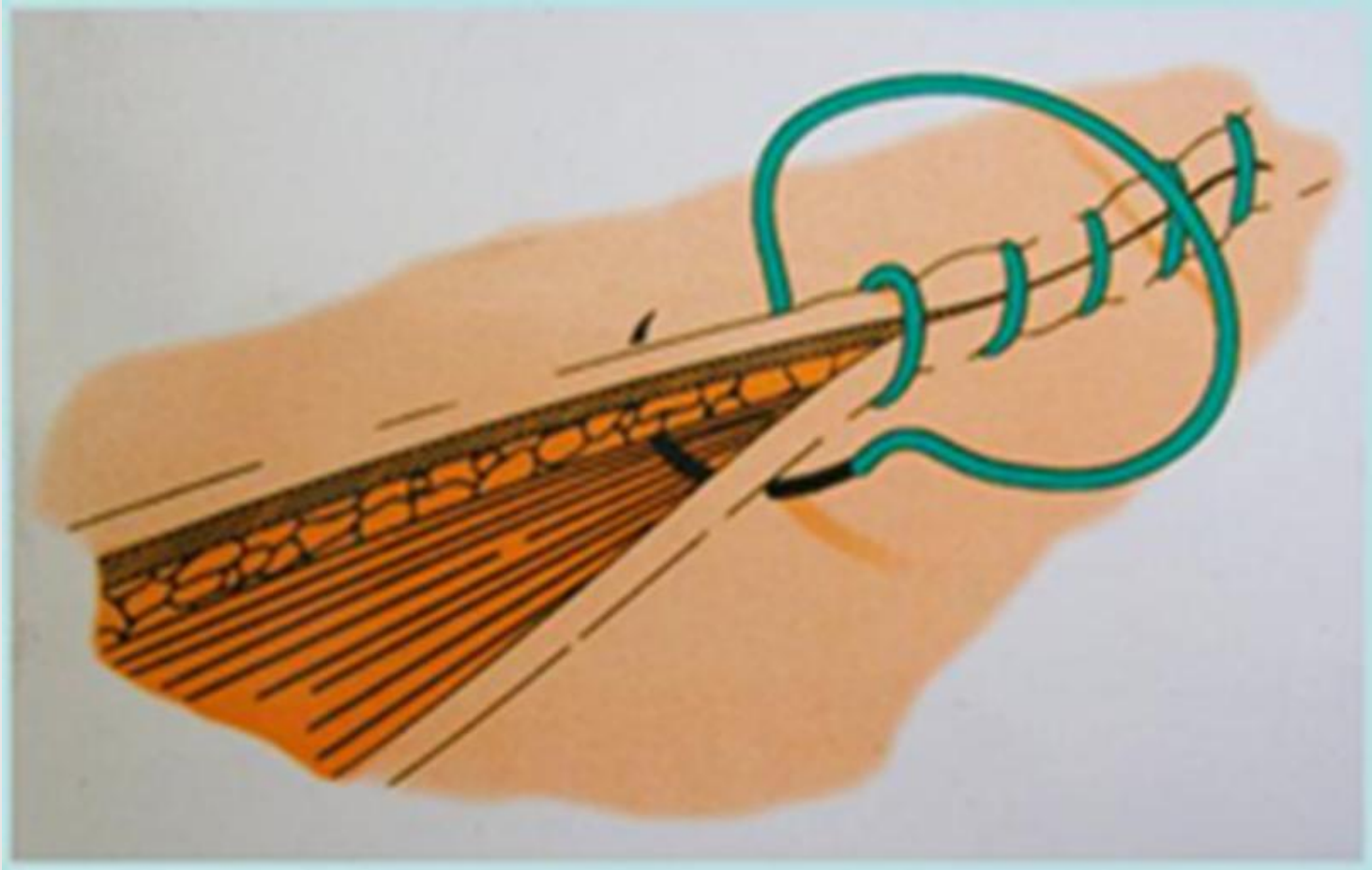
Advantages:

- ✓ Often a quicker pattern to place
- ✓ Less foreign material is placed in the incision site

Disadvantage:

- ✓ Failure of one knot will not affect the incision suture line

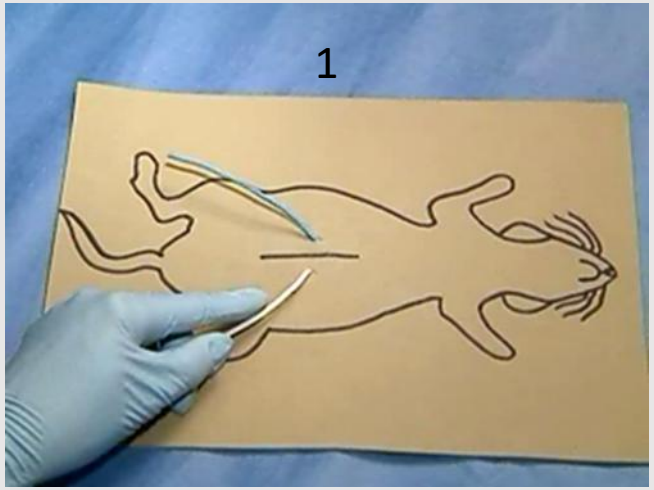
Suture Pattern: Simple Continuous Example

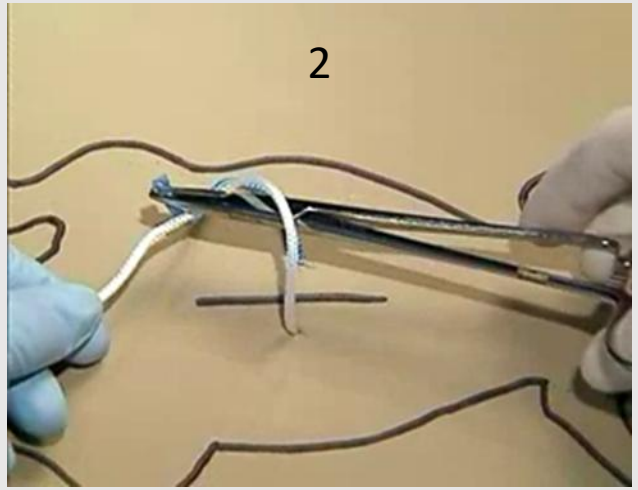


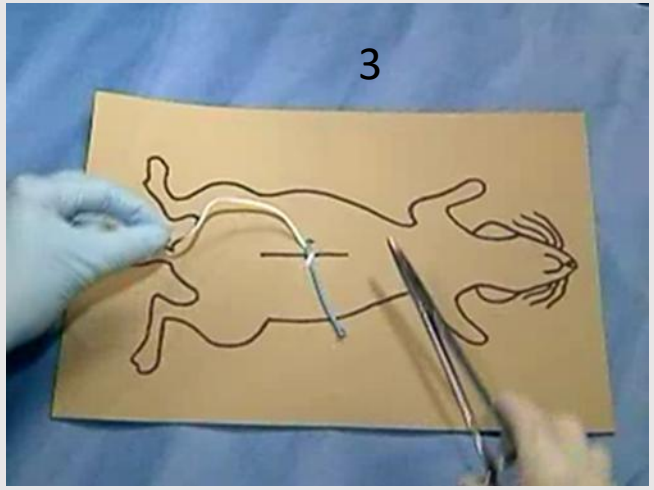
Suture Practice: Instrument Knot Tying

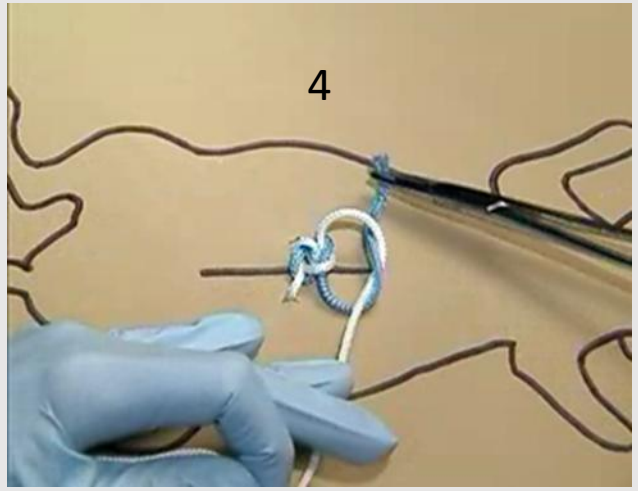
- ✓ Practice often until skill and comfort level well established
- ✓ View videos and obtain individual coaching if needed
- ✓ Use suture practice boards and inanimate objects
- ✓ Use deceased rodent carcasses (with hair shaved)

Suture Practice: Instrument Knot Tying Example









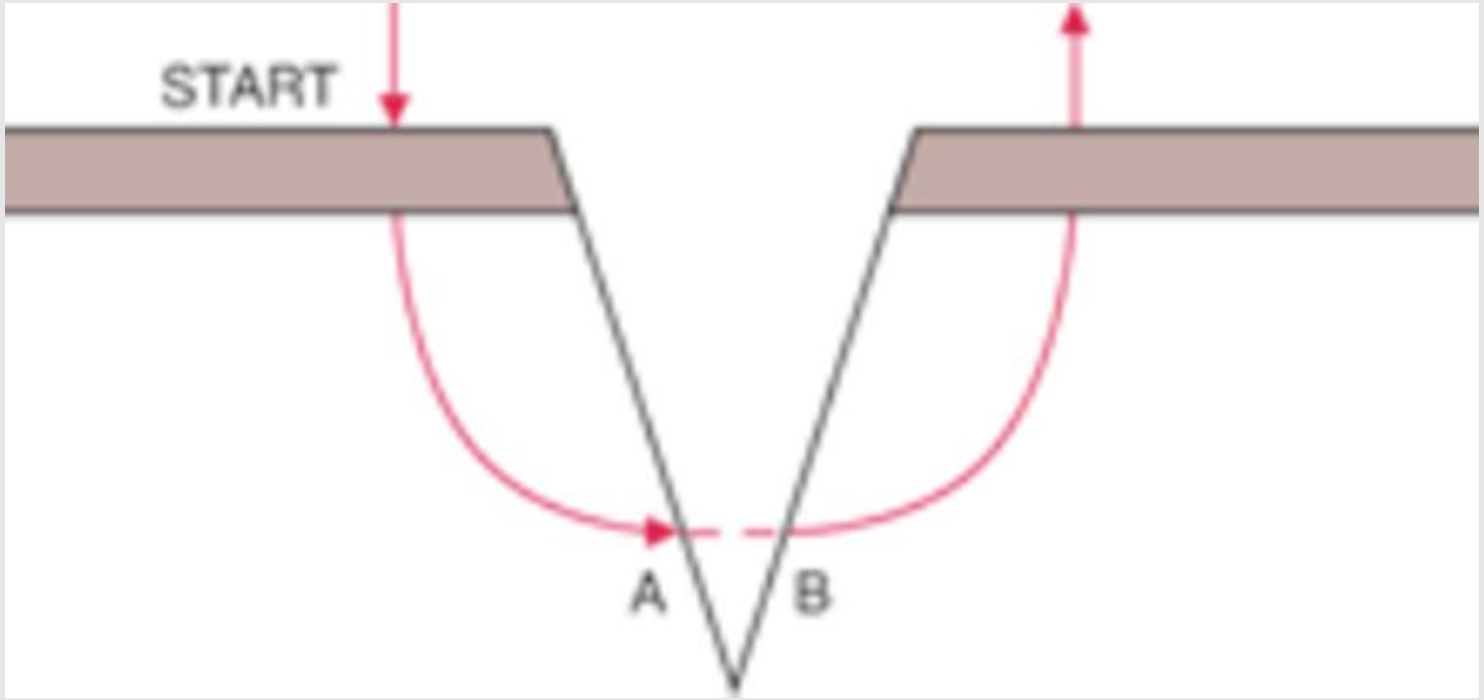
Suture Practice: Suture Techniques for Good Wound Edge Closure

Equal Bites: The “bite taken (with the needle) on one side of the incision line must be equal to the “bite” taken on the second side

Equal Depths: The depth that the needle passes through the tissue should be equal on both sides

Suture Practice: Suture Techniques for Good Wound Edge Closure Cont.

Illustration of Good Technique



Suture Practice: Suture Techniques for Good Wound Edge Closure Cont. (A)

- ✓ Suture Techniques for Good Wound Edge Closure
- ✓ Perpendicular: The needle should pass through the tissue perpendicular to the incision to help restore the anatomy correctly
- ✓ Square Knots: Always use square knots to provide the best holding security

Suture Complications

Suture line can become undone (dehiscence)

Suture line can become infected

- ✓ Use good aseptic technique to prevent
- ✓ Place, so not irritating animal (for example, not poking a body part or a fold of skin)

Suture Complications Cont.

Suture line can be placed too tight:

- ✓ Wound margins will become moderately swollen
- ✓ Tight sutures strangulate tissue and are painful
- ✓ Animals chew and remove sutures if they are irritating

Suture Removal

Must remove suture or wound clips by 10-14 days after surgery

Time for suture removal can vary (for example, up to 14 days), depending on the surgical site and tissue healing

If incision closure materials are not removed, they become embedded in the skin and will cause irritation and possible infection

Suture Removal Steps

- ✓ Clean incision site area with antiseptic, such as hydrogen peroxide to remove dried serum encrusted around the sutures
- ✓ Pick up one end of suture with thumb forceps or thumb and index finger, and cut as close to the skin as possible where the suture enters the skin
- ✓ Gently pull the suture strand out through the side opposite the knot with the forceps
- ✓ To prevent infection risk, remove the suture without pulling any portion that has been outside the skin back through the skin

QUESTIONS & SUPPORT

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