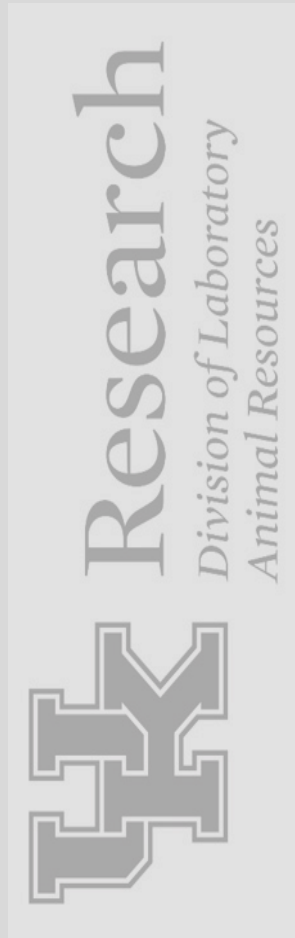


Suturing Basic for Rodent Wound Closure



Background

Appropriate wound closure is important to avoid problems:

Infection



Dehiscence

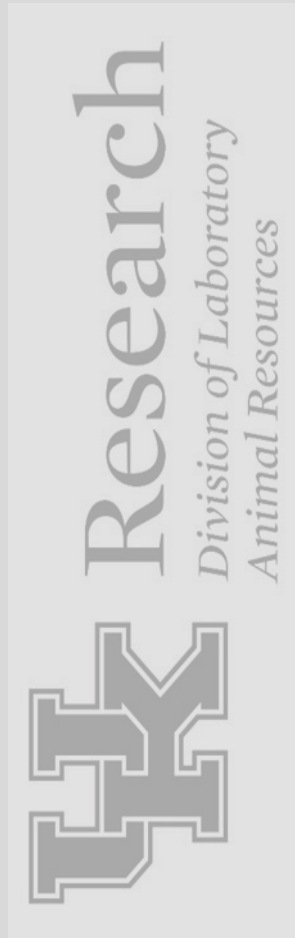
Wound Coming Apart



Background

Important to select the proper sterile suture materials:

- * Suture material
- * Suture needles
- * Suture pattern



Tying 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

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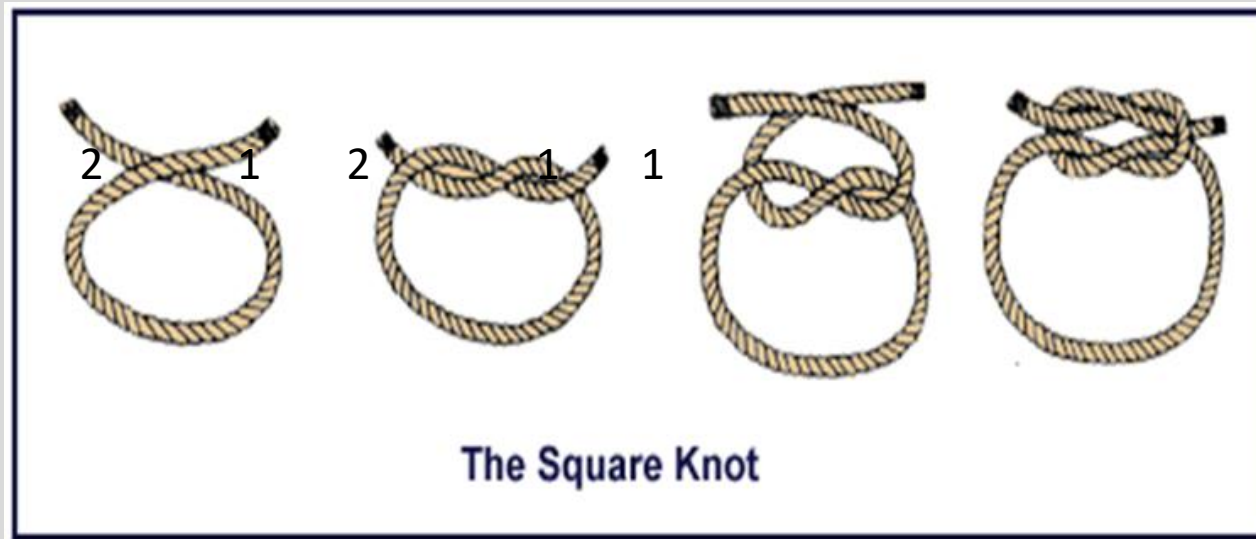
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Tying Secure Square Knots

Illustrations of 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



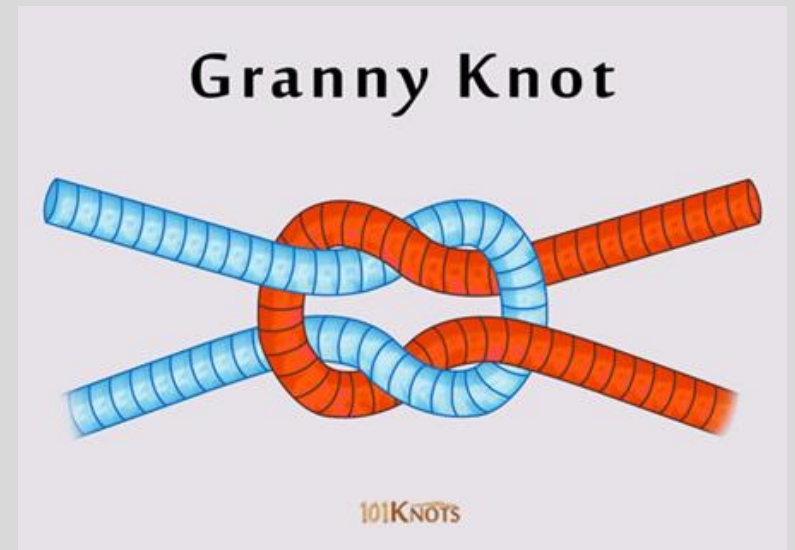
Recognition of Non-Secure Knots

Definition of Non secure Knots:

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

Asymmetrical knots:

- * Granny Knots
- * Slip Knots / Half Hitch Knots



Recognition of Non-Secure 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

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Other Types of Wound Closure Material

Wound Clips / Surgical Staples



Surgical Glue
(vetbond; nexaband)

Suture Patterns

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

Simple Interrupted



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

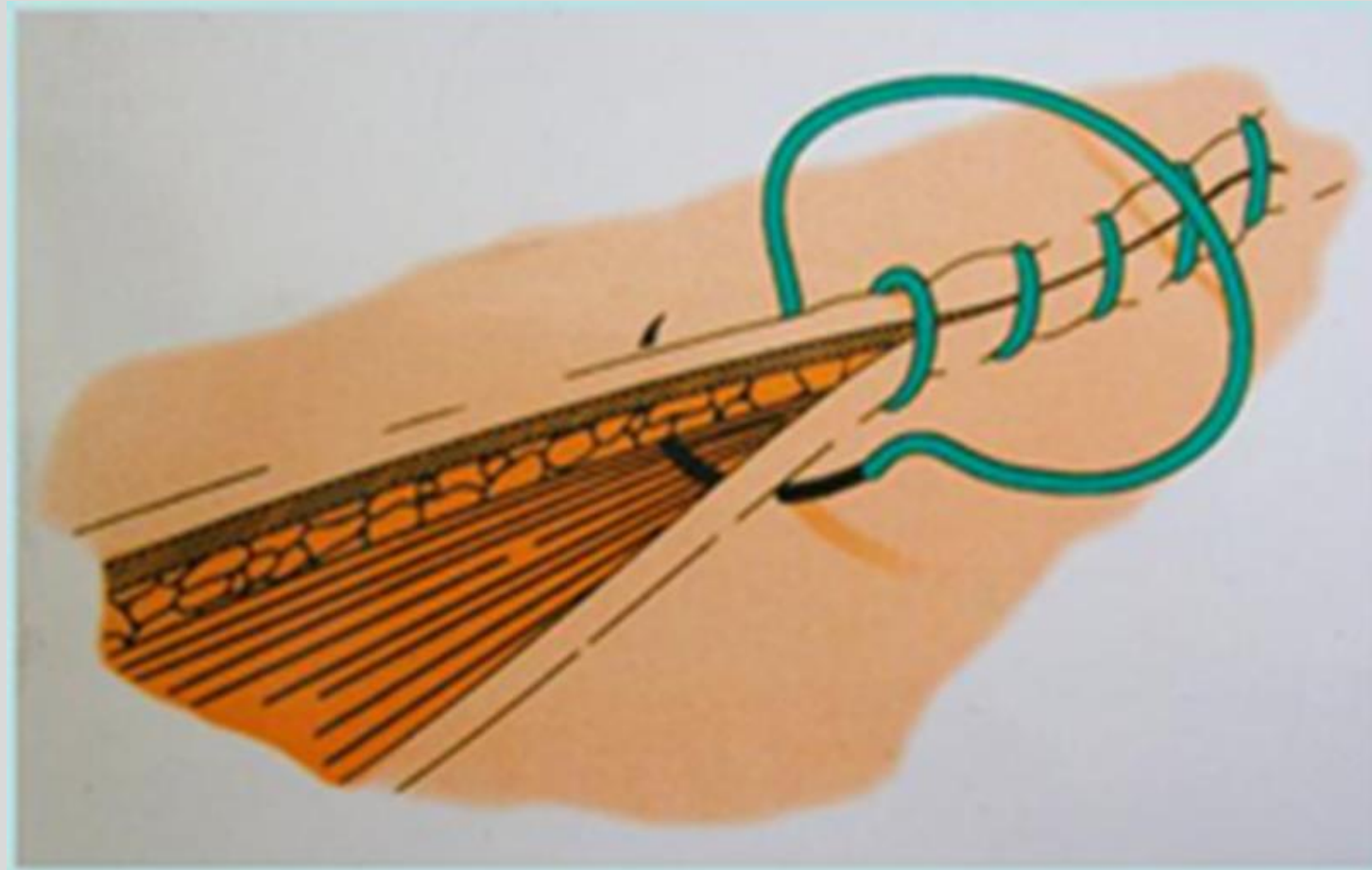
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Suture Patterns

Simple Continuous



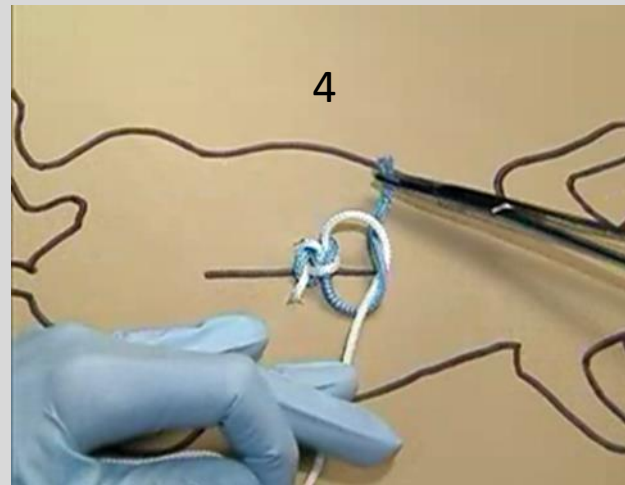
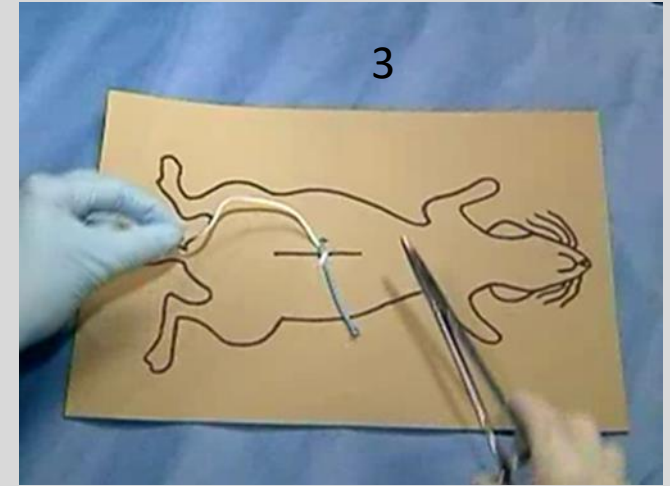
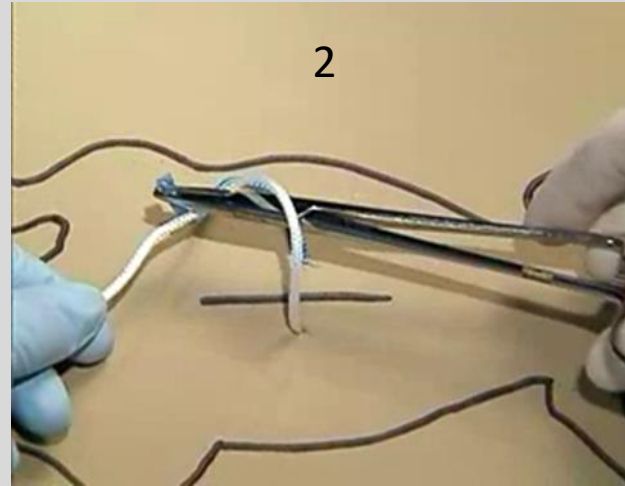
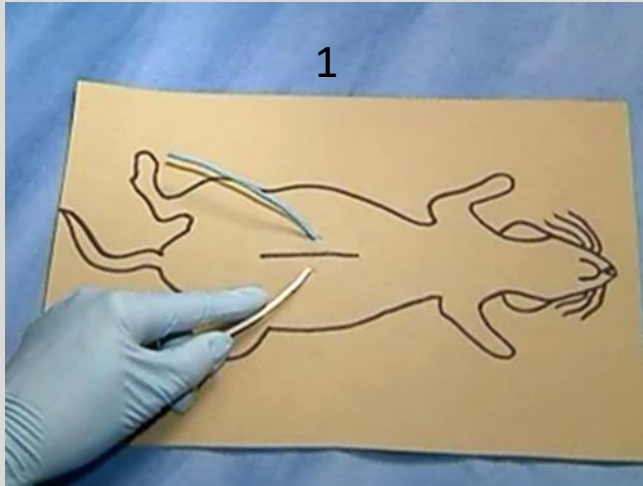
Suture Practice

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



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

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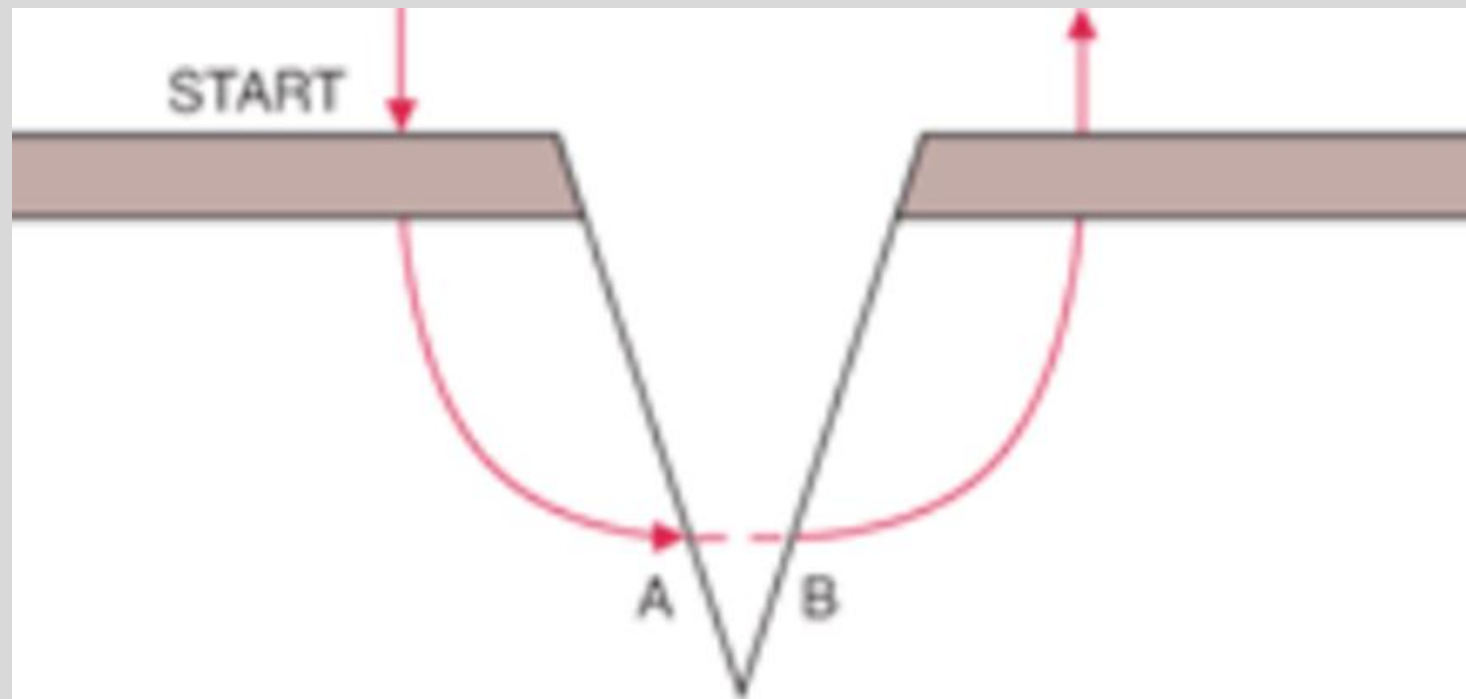
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Suture Practice

Suture Techniques for Good Wound Edge Closure

Illustration of good technique



Suture Practice

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

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Suture Practice

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)

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Suture Practice

Suture Complications:

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

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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

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

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