



Florida State University Guidelines - Wound Closure In Rodents

(Adopted by the FSU ACUC 05/25/2005)

Proper wound closure is necessary to avoid post-surgical complications (e.g. infection, wound dehiscence). Selection and proper use of suture material, suture needles and suturing pattern is critical for successful wound closure and healing. Sutures should be selected on the ability to perform the job intended and should be appropriate to the tissue layers to be closed. The same holds true for needle selection and choice of suturing pattern. Below are items to be considered when determining how surgical incisions will be closed.

In general, any incision that penetrates a body cavity (thoracic or peritoneal) and is longer than 5 mm should be closed in two separate layers. The first layer will be the lining membrane (pleural lining or peritoneum), fascia and muscle. The second layer will be the skin. Incisions shorter than 5 mm may be closed in one layer due to a decreased risk of dehiscence if the skin sutures are disturbed. Any incision that penetrates only the skin may be closed in one layer. Also, all suture material and needles must be sterile at the time of use.

Suture Material Selection

The smallest suture size that will perform the job should be selected. Larger size suture only increases the amount of foreign material for to which the body might react. Size of suture should be based upon the size of the animal, organ or tissue and the location and function of the suture.

Suture material is either absorbable (use for below the skin applications) or non-absorbable (use above or below the skin), depending upon the material from which it is made. They may also be made from natural material (catgut, silk or cotton) or from synthetics (stainless steel, nylon, polyglactin). Suture may either be threaded through a needle or come commercially prepared with an attached (swaged on) needle. Preference for suturing is with swaged needle suture material as it causes less tissue trauma.

SUTURE TYPE	CHARACTERISTICS; USES
Polyglactin 910 (Vicryl®), Polyglycolic acid (Dexon®)	Absorbable; takes 60-90 days. Use to ligate or suture tissues where an absorbable suture is desirable.
Polydioxanone (PDS®), Polyglyconate (Maxon®)	Absorbable; takes 6 months. Use to ligate or suture material where an absorbable suture and extended wound support is desirable.
Chromic Gut (aka catgut)	Absorbable. Versatile. Useful for wounds not expected to become infected or experience post-operative fluid accumulation.

Polypropylene (Prolene®)	Non-absorbable. Inert.
Nylon (Ethilon®)	Non-absorbable. Inert. Used for general closure.
Silk	Non-absorbable. Excellent handling. Preferred for cardiovascular procedures. Caution: Causes tissue reaction and braided nature may wick microorganisms into the surgical wound.
Stainless Steel Wound Clips, Staples	Non-absorbable. Suitable for skin closure. Requires instrument for removal.
Cyanoacrylate (Vetbond®, Nexaband®)	Skin glue. For non-tension bearing wounds.

Note on needles – Needles may be either cutting (cutting, reverse cutting) or non-cutting (taper or round point). Cutting needles have edges that cut through dense, difficult to penetrate tissue (e.g. skin). Non-cutting needles have no edges to cut through tissue and are used to suture easily torn tissues such as muscle, intestine or peritoneum (delicate tissues).

Suture Patterns

Incisions may be closed in a number of different patterns and the selection can greatly affect the success of wound healing. The simplest ones are simple interrupted and simple continuous. For other patterns, consult a surgical textbook. Interrupted patterns provide greater strength and especially security if one knot becomes untied; however it results in more suture material and increases the amount of foreign body to which the animal may react. Continuous patterns take less time to complete, minimize suture material and are often easier to perform unassisted. However, if one end becomes untied, the entire length of the incision may come apart under tension. In general, continuous patterns may be used for muscle layer closure or subcutaneous closure, but skin closure requires an interrupted pattern or use of sterile wound clips. For further information on suture patterns and selection of the most appropriate pattern for the surgery planned, contact the LAR veterinarians.