

SUTURE TYPES

Sutures come either as monofilament or braided:

* **Monofilament** sutures cause less reaction than do braided sutures, but require more ties to assure an adequate maintenance of the knot compared to braided suture. Monofilament sutures are usually non- absorbable.

* **Braided** suture usually incites a greater inflammatory response but, requires fewer ties to maintain the knot integrity. These include silk, cotton and Mersilene.

The strength of the sutures varies according to their size, which can be determined by a uniformly applied number. For example, a 6-0 suture is more delicate and has less strength than a 4-0 suture.

Sutures come as either absorbable or non absorbable:

Absorbable sutures are made of materials which are broken down in tissue after a given period of time, which depending on the material can be from ten days to eight weeks. They are used therefore in many of the internal tissues of the body. In most cases, three weeks is sufficient for the wound to close firmly. The suture is not needed any more, and the fact that it disappears is an advantage, as there is no foreign material left inside the body and no need for the patient to have the sutures removed.

Absorbable sutures were originally made of the intestines of sheep, the so called catgut. However, the majority of absorbable sutures are now made of synthetic polymer fibers, which may be braided or monofilament; these offer numerous advantages over gut sutures, notably ease of handling, low cost, low tissue reaction, consistent performance and guaranteed non-toxicity.

Natural Absorbable Sutures

1. Catgut Sutures- **Plain catgut and Chromic catgut sutures**

Synthetic Absorbable Sutures

2. Polyglycolic Acid Sutures (**Vicryl**) (PGA sutures)- coated and braided suture
3. Polyglactin 910 Sutures (PGLA sutures)- coated and braided suture
4. Poliglecaprone Sutures (**Monocryl**) (PGCL sutures)- monofilament suture
5. Polydioxanone Sutures (**PDS**)- monofilament suture

Non absorbable sutures are made of materials which are not metabolized by the body, and are used therefore either on skin wound closure, where the sutures can be removed after a few weeks, or in some inner tissues in which absorbable sutures are not adequate. This is the case, for example, in the heart and in blood vessels, whose rhythmic movement requires a suture which stays longer than three weeks, to give the wound enough time to close. Other organs, like the bladder, contain fluids which make absorbable sutures disappear in only a few days, too early for the wound to heal. There are several materials used for non absorbable sutures. The most common is a natural fiber, silk, which undergoes a special manufacturing process to make it adequate for its use in surgery. Other non-absorbable sutures are made of artificial fibers, like polypropylene, polyester or nylon; these may or may not have coatings to enhance their performance characteristics. Finally, stainless steel wires are commonly used in orthopedic surgery and for sternal closure in cardiac surgery.

Non-Absorbable Sutures:

1. Silk Sutures – Black Braided suture
2. Polypropylene sutures (Prolene)- monofilament suture
3. Nylon suture or Polyamide sutures- monofilament suture
4. Polyester sutures- coated and braided suture

SUTURE SIZES: The size of suture material is measured by its width or diameter and is vital to proper wound closure. As a guide the following are specific areas of their usage:

1. **1-0 and 2-0:** Used for high stress areas requiring strong retention, i.e. deep fascia repair
2. **3-0:** Used in areas requiring good retention, i.e. scalp, torso, and hands
3. **4-0:** Used in areas requiring minimal retention, i.e. extremities. Is the most common size utilized for superficial wound closure.
4. **5-0:** Used for areas involving the face, nose, ears, eyebrows, and eyelids.
5. **6-0:** Used on areas requiring little or no retention. Primarily used for cosmetic effects.

SURGICAL NEEDLES: There are a variety of needles for wound closure. Curved needles have two basic configurations; tapered and cutting. **For wound and laceration care, the reverse cutting needle is used almost exclusively.** It is made in such a way that the outer edge is sharp so as to allow for smooth and atraumatic penetration of tough skin and fascia. **Tapered needles are used on soft tissue**, such as bowel and subcutaneous tissue, or **when the smallest diameter hole is desired.**

SURGICAL INSTRUMENTS: It is not necessary to have large numbers of instruments for emergency wound care. Wounds and lacerations can be managed with the following instruments:

1. **NEEDLE HOLDERS:** Needle holders come in various sizes and shapes, but for most lacerations a standard size 4" will complete the task. For larger, deeper wound closures a larger needle and needle holder may be required.
2. **FORCEPS:** Grasping and controlling tissue with forceps is essential to proper suture placement. However, whenever force is applied to skin or other tissues, inadvertent damage to cells can occur if an improper instrument or technique is used. Be gentle when grasping tissue, and never fully close the jaws on the skin.
3. **SCISSORS:** There are three types of scissors that are useful in minor wound care.
 - a. **IRIS SCISSORS:** Iris scissors are predominantly used to assist in wound debridement and revision. These scissors are very sharp and are appropriate in situations that require very fine control. They are very delicate and are not recommended for cutting sutures. However, when very small sutures require removal they can be used.
 - b. **DISSECTION SCISSORS:** Used for heavier tissue revision as necessary for wound undermining.
 - c. **SUTURE REMOVAL SCISSORS:** Standard 6-inch, single blunt-tip, suture scissors are most useful for cutting sutures, adhesive tape, and other dressing materials. Because of their size and bulk, these scissors are very durable and practical.
4. **HEMOSTATS:** Hemostats have three functions in minor wound care: clamping small blood vessels for hemorrhage control, grasping and securing fascia during debridement, and are an excellent tool for exposing, exploring and visualizing deeper areas of the wound.
5. **KNIFE HANDLES AND BLADES:** The knife handle holds the blade and is used in the debridement and excisions during wound revision. Common blades are the #10 blade (used for large excisions), #15 blade (small, versatile and well suited for precise debridement and wound revision), and the #11 blade (ideal for incision and drainage of superficial abscesses and the removal of very small sutures).