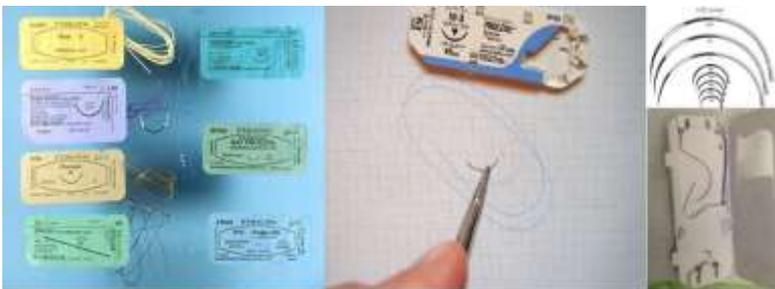


# Stitching up Sorrows - Sutures & Suture Material

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It's like sewing clothes and tying fly fishing knots melted together. "Suture" refers to the type of surgical thread used to repair lacerations. Typically this material will react little with a person's body. But in certain instances, the reaction can be intense. There are hundreds of different types of suture. Getting the right kind can be confusing.



(LEFT) - VARIOUS TYPES AND SIZES OF SUTURES. NOTE THE STRAIT SUTURE NEEDLE ON THE BOTTOM LEFT, AND THE VARIETY OF CURVED NEEDLES IN THE UPPER RIGHT CORNER

Suture comes in many varieties. Absorbable and non-absorbable, braided and non-braided, and even some that have been pre-treated with antibiotics.

Suture is rated like fishing line. But instead of “pound-test,” a numbering system of zeros “0” is used. The more zeros, the smaller the diameter of the material.

For example, the abbreviation “5-0” means 00000. A package of suture may be marked as 3-0 (000), 6-0 (000000), or any variety of other numbers.

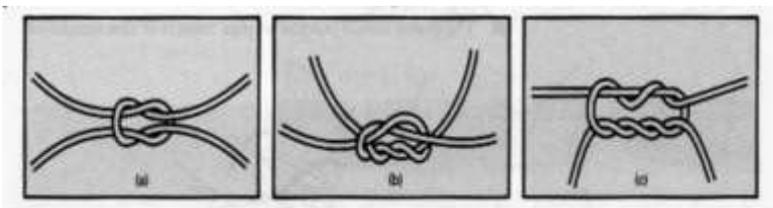
The more zeros, the more delicate the suture. 6-0 suture for instance, is very small, and is used for cuts on the face and in other plastic surgeries. This size isn’t used often by preppers, a package or two is all most will need.

What you’ll want is suture a bit thicker than the thread you’d

WHILE IN THE GARAGE, LOOK FOR A FISHING TACKLE BOX. TAKE THE CLEAN OR UNUSED FISHING LINE, NEEDLE NOSE PLIERS (FISHERMEN USE THESE TO REMOVE HOOKS), AND ANY NEEDLES AND SYRINGES YOU FIND (USED BY FISHERMEN TO PUFF UP WORMS WITH AIR.) ALSO GRAB A FEW HOOKS AND LEAD SINKERS FOR FISHING LATER. YOU MIGHT ALSO FIND HAND SANITIZER LIKE PURELL, THAT’S LIKE GOLD! NOW KEEP MOVING!

use to sew clothes. Keep in mind that suture material is designed to be stronger than sewing thread the same size, just as fishing line is. This means that unused or sterilized fishing line can be an acceptable substitute for suture, when there's nothing better available. The problem, as you'll remember from fishing, is that the material is hard to tie into tight knots. So if you use it to stitch someone back together, tie lots of knots and leave long tails on the ends. Otherwise it can come undone and cause the wound to reopen.

Many of the first modern surgeons had an obsession with fly fishing. Even today their fly knots are taught to surgical residents for use with slippery suture material. It may be easier to use thick sewing thread, and not fishing line, when you're afraid of the knot coming undone.



Reef Knot

Surgeon's Knot

Nylon Knot

**Suture Sizes** Most useful are sizes between 2-0 and 5-0. If you can only get one size buy 3-0. It's better to use a heavier material than you need, than selecting a smaller size that might break.

## Suture Sizes by Body Area

<u>Wound location</u>	<u>absorbable</u>	<u>nonabsorbable</u>
Under tension	3-0, 4-0	4-0
Face	5-0	5-0, 6-0
Small or no tension	5-0	5-0
Extremities		4-0, 5-0
Trunk		4-0

Surplus suture can sometimes be bought in bulk from veterinarian suppliers, though in this form only the inside of the package is sterile. This is the best way to buy it. It's inexpensive this way, and comes in a mix of sizes and materials.



50 piece mixed suture sets available from Amazon.com  
Single wrapped packages are shown on the left, double wrapped sterile packages are shown on the right.

Purchasing suture packaged in a box, and wrapped in a second sterile cover, can get expensive. Medical students often buy a combination of surplus single packaged units, and use them to practice their surgical technique.

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*Packages of mixed single wrapped suture materials, and inexpensive surgical instruments, can be found at Amazon.com.*

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Double packaging is an issue for the operating room, doctor's office, or if the prepper wants to use strict sterile technique. When packaged this way, the outer covering can be

peeled back, and the sterile inner package dropped into a germ free area. An area like the one I am describing here is called a sterile surgical field. Details of the entire technique can be found in YouTube videos, and in the appendix of this book.

Single packaged material is good enough for most purposes. The material inside is sterile; at least until the package is opened and the suture is removed. I don't use sterile technique in the wilderness any longer. I've found that sterility in the outdoors, and in natural disasters, is wishful thinking and terribly frustrating.



IF YOU BUY SUTURE BY THE BOX, YOU ONLY GET ONE SIZE SUTURE ON ONE SIZE NEEDLE. BUT EACH PACK IS INDIVIDUALLY WRAPPED AND STERILE

SOME TYPES OF SUTURE ARE NO LONGER STERILE AFTER THE OUTER WRAPPING IS REMOVED (TOP) SOME STILL ARE (BOTTOM)

LEARN TO READ THE SUTURE ABBREVIATIONS SHOWN ON THE PACKAGING. OFTEN THE NEEDLE'S PICTURE IS ITS ACTUAL SIZE

Whether you buy a box of sterile suture, or an individual package, the material will usually come attached to a needle. And the needle shown will be its actual size.



It's best to look at each loose package, ensuring it has a needle pictured before you buy it. That way if you don't need the needle, you can cut it off later. But trying to attach a needle afterward is like trying to herd cats. You end up struggling for hours and getting nowhere.

Suture can be divided into two types, absorbable and non-absorbable. Preppers often find non-absorbable materials easier to use and more robust. Absorbables are designed for internal use, as with appendectomies or hernia repairs. They can be used to repair skin cuts, but may cause the wound edges to turn red. The resulting discoloration can be mistaken for an infection.

**Absorbable Materials** In order to break down and be removed, absorbable suture must activate the immune system. Redness from inflammation, and not necessarily infection, often ensues. So if you use absorbables, expect discoloration and look to other indicators to decide if an

infection has developed. Excessive warmth, tenderness and unclear or foul smelling discharge are signs the repair has gone south.

The names of the older non-synthetic absorbables end with the word “gut.” Plain gut and chromic gut being most common. These two materials are known to most people as “cat gut,” though they’re really made from sterilized sheep intestine. Plain gut sticks around for about a week on the skin before its outer exposed part starts to fall away.

<b>Absorbable Sutures and Their Features</b>			
<b>Product</b>	<b>Features</b>	<b>Advantages</b>	<b>Disadvantages</b>
Gut (plain)	Natural product, absorbed by proteolysis	Inexpensive, maintains tensile strength for 4-5 days	Poor tensile strength, poor knot security, high tissue reactivity, quickly absorbed
Gut (chromic)	Natural product, absorbed by proteolysis	Less tissue reactivity than untreated catgut, prolonged tensile strength	Moderate tissue reactivity, poor knot security
Polyglycolic acid (Dexon)	Synthetic product, monofilament, absorbed by hydrolysis	Delayed absorption, greater tensile and knot strength, diminished tissue reactivity	Stiff, difficult to handle (braided version easier to handle)
Polyglactac acid (Vicryl)	Synthetic product, coated with lubricant, absorbed by hydrolysis	Easy to handle, tensile strength approximately equal to polyglycolic acid, diminished tissue reactivity	Dyed form may be visible through skin
Polyglactac acid (PDS)	Synthetic product, monofilament, hydrolyzes slowly	Extended duration of tensile strength (about 74% at 2 weeks), minimal foreign body reaction	Quite stiff, difficult to handle
Polyglyconate (Maxon)	Synthetic product, monofilament, hydrolyzes slowly	Extended duration of tensile strength (about 81% at 2 weeks); supple, easy to handle	Expensive; new product, limited experience

Plain gut, chromic gut, and Vicryl are the most important absorbable sutures for preppers. Other common forms are also shown, as they may be included in mixed packages of suture, and are very useful to have.

While this means some types of absorbable suture don't need to be removed, it also means they're going to cause inflammation. This can make the wound itch more than usual. Remember that lacerations almost always itch when they're healing, it's a good sign. But excessive pain and tenderness are not.

**Characteristics of Absorbable Suture Materials**

Material	Tensile strength half-life, days	Tissue reaction	Configuration	Ease of handling	Knot security	Color
Gut (fast absorbing)	2	2	Mono	1	1	N
Gut (plain)	4	4	Mono	1	1	N
Gut (chromic)	7	4	Mono	1	2	N
Dexon	14	2	Braided	3	4	G,W
Vicryl	14	2	Braided	3	4	V, G
PDS	28	2	Mono	2	3	C,V
Maxon	21-28	2	Mono	3	3	C, G

1 – Lowest; 4 - highest

The colors are N=not colored or natural color, G=green, W=white, V=violet, and C=clear. Clear suture can be very difficult to see while sewing, especially at night or in low light.

Chromic gut is also dissolvable, but those stitches have to be removed later. Their chrome coating makes them last longer. Newer synthetic types are made of protein or carbohydrate combinations. They often have the word "glactin" somewhere in their generic name. Vicryl, the brand name for Polyglactin suture, is a common example.



Vicryl is an excellent absorbable suture. It's braided and easy to tie, but must be removed later because it dissolves slowly.

***Non-Absorbable Materials*** Try to stay with non-absorbable materials. They too are made of both natural and artificial fibers. The synthetics are made of nylon or something similar. Like fishing line, they can be hard to tie into tight knots.

Some artificial sutures are braided, meaning they have small connected sections along their length. You can feel these as tiny indentations by running your fingers down the material. The grooves help lock the suture into place when tied; that's why I recommend braided materials.

The most common and perhaps most useful braided suture is silk. It's cheap and easy to tie with an old fashion square knot. Tie three or four times, cut off the excessive string, and move on to the next one.

Silk is the best suture for most purposes. I carry it in my emergency bag. It's inexpensive and easy to use.

One thing to keep in mind, is that braided suture has a little bit higher infection rate than smooth materials like nylon.

The nicks in it are great for keeping a knot tight, but they also provide a place for bacteria to harbor and reproduce.

### **Common Characteristics of Non-Absorbable Suture**

<b>Material</b>	<b>Tissue reaction</b>	<b>Configuration</b>	<b>Ease of handling</b>	<b>Knot Security</b>
Silk	4	Braided	4	4
Nylon (mono)	1	Mono	2	2
Nylon (braided)	2	Braided	3	4
Polypropylene	1	Mono	1	1
Polybutester	1	Mono	2	3
Polyester (uncoated)	1	Braided	3	3

1- Lowest; 4 - Highest

It may not surprise you to learn that the very first suture was made from cotton, a material that still works well today. It has a higher infection rate than others, but can be found in travel sewing kits. It's not as strong as silk, but that isn't a problem if you use thicker thread, or use two strands at once.

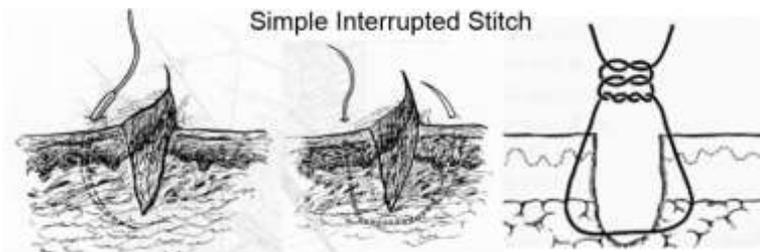
When you're on the move keep an eye out for a sewing kit, it makes a convenient alternative to surgical suture. Moreover, it's

LOOK IN THE KITCHEN DRAWERS, COAT CLOSETS, AND DRESSERS FOR A SEWING KIT OR SEWING SUPPLIES. DO THE SAME AS YOU MOVE THROUGH LOOTED STORES.

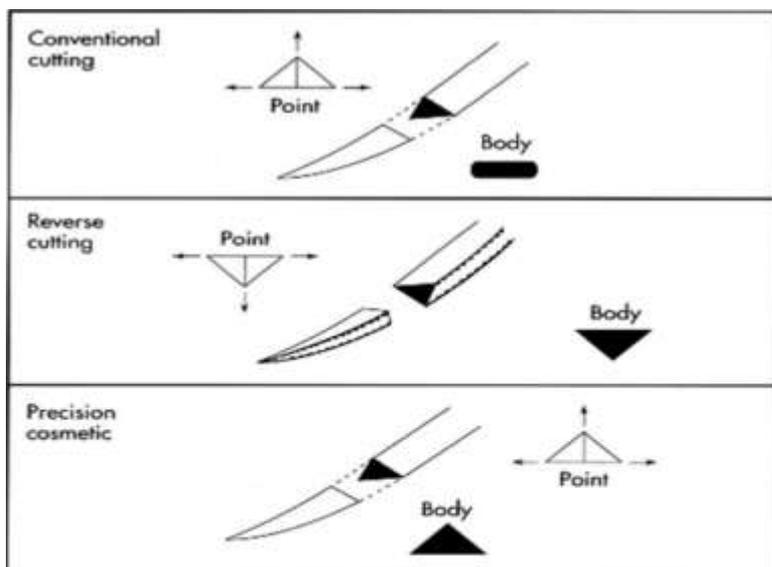
TRAVEL SEWING KITS HAVE EVERYTHING NEEDED FOR IMPROVISED SKIN REPAIRS.

likely to be left over after everything else has been looted from your neighborhood store; and most homes have one. Thread, needles, scissors; all in one compact box.

Surgical suturing needles come in many confusing sizes and configurations. Discussed before, suture generally comes with a needle attached. Most needles are curved into a half-circle, others are strait and *flat at the end*. What's important is that they're labeled "cutting" or "reverse cutting" on the package. Soon we'll cover techniques for suturing. For now note that most needles are curved, so when you stick them in and twist, they'll naturally travel under the cut and come out on the other side.



Curved surgical needles are designed to track underneath the wound and emerge on the other side. You can grab both ends, one in each hand, and tie several square knots. Or you can use an instrument tie to save time.



There are many different types of needles, you'll want the kind marked "cutting" or "precision." These usually have one or two letters followed by a number. For instance, FS-2 stands for "For Skin" and has a size 2 needle. PS stands for "Precision Skin" and are for plastic surgery and expensive.

*Now that we know what we are looking for, let's learn how to properly rob a doctor's office!*