

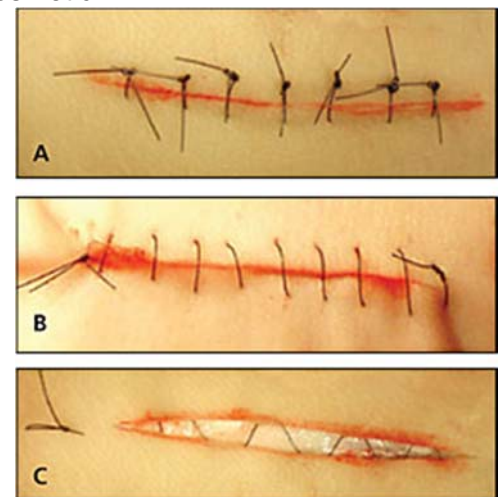
**LAB – Banana Surgery and Suturing Practice****BACKGROUND****Surgery**

Surgery is used when physical intervention is required to treat a patient. In general, surgery involves excising or correcting tissues of the body. A non-invasive surgery refers to a surgery that does not penetrate the structure being excised or corrected, while invasive surgery does. There are many different types of surgery performed with the goal on becoming less invasive as medical technology improves.

Surgical procedures can be categorized by the type of procedure, body system(s) that are being treated, the degree of urgency, level of invasiveness, and/or the instruments being used in the surgery. There are various types of surgeries ranging from emergency to exploratory to cosmetic.

**Suturing**

Suturing is used to close wounds and has been practiced for thousands of years. It is commonly known by the general public as stitches. While the materials used in suturing and techniques have changed during that time, the general goal has remained: minimize bleeding, reduce the risk of infection, close skin edges allowing for function and healing, and support and strengthen a wound until the body's own healing process takes over. There are many different types of suturing techniques based on the type of wound, location of the wound, skin thickness, and the desired result. Using the correct suture technique will reduce scarring and allow for proper function of the tissue.

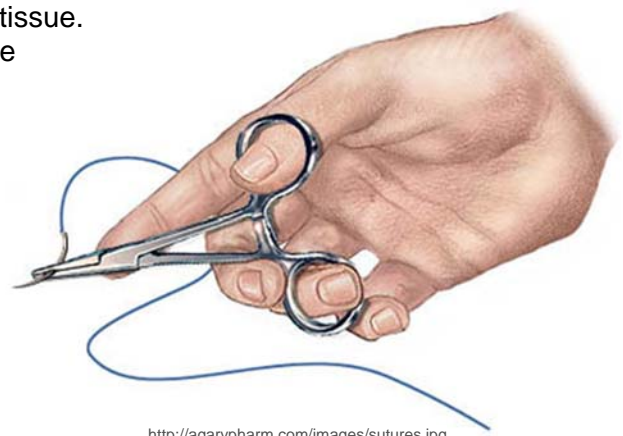
**Basic Suturing Principles****The Needle**

Suturing needles are most commonly curved and made of 3 sections. The point, or tip, is sharp and used to penetrate tissue. The body is the middle of the needle, and the swage is where the suturing material attaches.

<http://www.aafp.org/afp/2008/1015/afp20081015p945-f1.jpg>

**The Needle Holder**

The use of forceps or specialized needle holders to grasp the needle while suturing allows for greater dexterity while suturing. Using needle holders also prevents the chance of the suturing needle piercing the gloves or skin of the healthcare provider during suturing, and therefore reducing the risk of contamination. The forceps may also be used to grasp and hold the tissue during suturing.



<http://aqarypharm.com/images/sutures.jpg>

**The Suture Material**

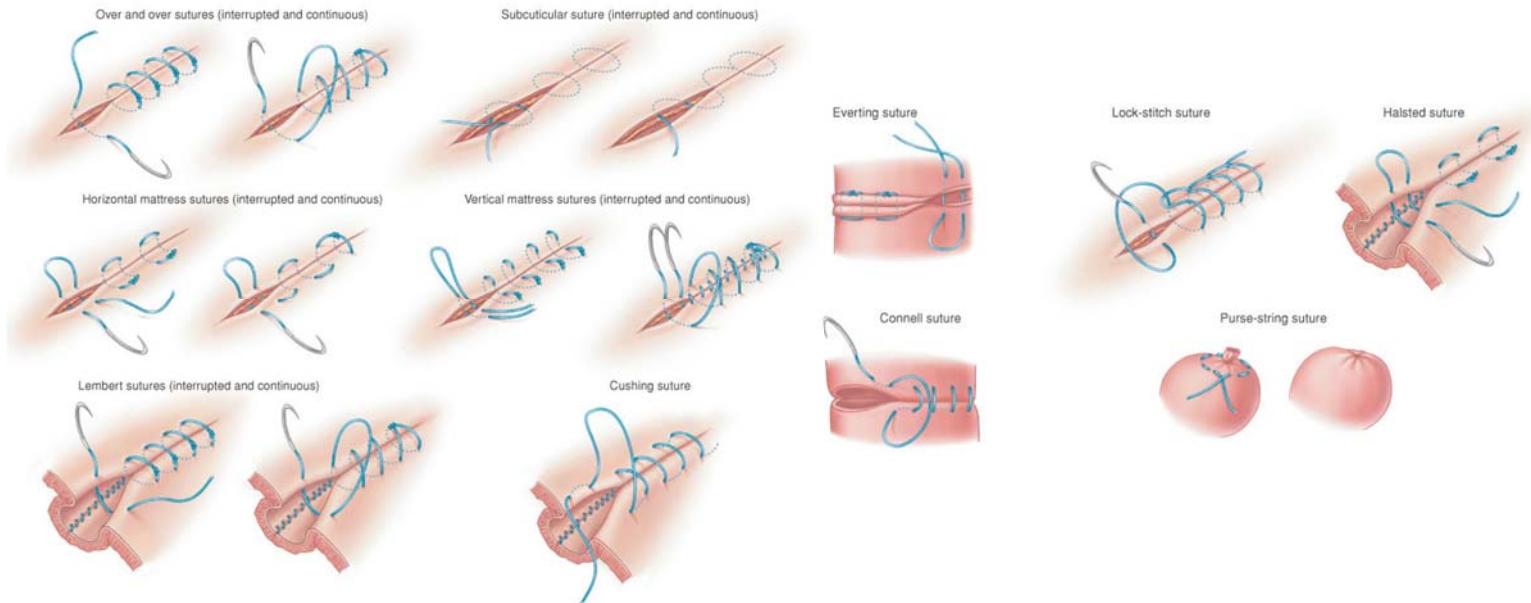
There are many different types of suture material. The material may be synthetic and require later removal, or come from an organic source that will eventually be broken down or pushed out by the body. The most common organic sutures are called catgut, but are usually collagen from bovine intestine. Polyglycolide and polydioxanone are the most common synthetic sources of suture material.

## Knot Tying

The square knot is the most commonly used knot for cutaneous suturing procedures. The square knot allows for the suture material to hold tightly and can easily be made with suture material.

## Suturing Technique

Suturing technique refers to the type of stitching used to create the suture. The following diagram shows some most common suture techniques used.



Surgery. 2013. Types of Surgery. [www.surgery.com](http://www.surgery.com).

## Prepping the Patient

### DAY 1

In a group of 4, you will be prepping the patient (banana) for an exploratory surgery. Your patient is a 26-year-old female who just underwent open-heart surgery to correct a defect in the mitral valve 5 weeks ago. She has not been healing well and a recent chest x-ray was suspicious.

1) On your patient (the banana), with a permanent marker, draw: a face (eyelids, nose, mouth), a head of hair, navel, and 2 legs on the patient.

2) On your patient, draw a heart, stomach, uterus, 2 kidneys that lie retroperitoneal, and a rectum. All of **these should be in the correct location** on your banana.

3) In the space below, write directions on the location of where the surgery should be occurring. Use the correct anatomical terms for location.

4) Lastly, put an X where the surgeons will be cutting during tomorrow's surgery.

## DAY 2

You and your group will be operating on a patient that is not yours. In other words, you will not be doing the operation on the banana you drew on yesterday. You have grown too fond of the banana and are too close in order to operate without an emotional connection to the patient. Switch bananas with another group.

### Choose Surgical Team Roles

Everyone will switch roles between the four surgeries. If you only have 3 members in your team, combine the responsibilities of the scrub and circulating nurse.

- The chief surgeon will perform the incision, locate the issue, and respond accordingly
- The assisting surgeon will suture the incision
- The scrub nurse will prepare and handle equipment for the surgeon
- The circulating nurse will oversee the procedure and ensure the directions are followed

### Prepare the Surgical Room

- Collect the patient and place her comfortably at your lab table
- Collect your scalpel, forceps, scissors, sutures, and face mask
- Lay a paper towel out next to the operating table and lay each tool on the paper towel where it can easily be picked up during the surgery

### WASHING HANDS

Before you can begin the surgery, you must wash up. At the lab tables there are instructions on how to correctly wash your hands in order to be sterile for the surgery.

### Part A - The Surgery

1) Everyone on the surgical team needs to wear a facemask. Yes they are uncomfortable, but they must stay on for the duration of the surgery!!!

2) The chief surgeon will use the scalpel to make only a 1 to 2-inch vertical incision on the medial line of the chest, directly over the sternum. Do not push too hard! If you puncture or cut any underlying organs you could damage your patient!

3) Use the forceps to lightly pull the sides of the skin apart to look into the thoracic cavity of the patient. Find the heart and identify whether there are any abnormalities.

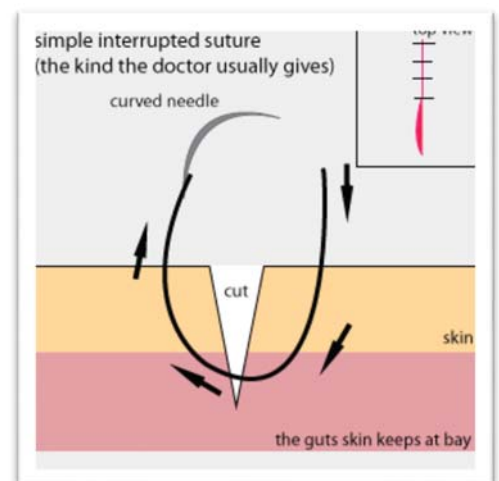
What did you find when you opened up the section?

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4) Remove any abnormality that is visible.

5) The assisting surgeon will use the forceps and scalpel to suture the incision. For this surgery we will use a simple interrupted suture.

6) To start a simple interrupted suture, push the point of the needle into the skin on one side of the incision and curve the needle up through the skin on the opposite side of the incision. See Diagram A.

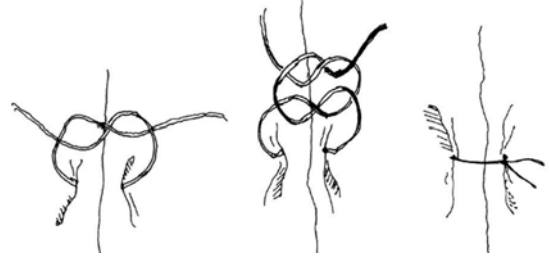


7) Pull the suture material (string) through the skin leaving about 2-3 inches of string on the free end.

8) Tie a square knot by crossing the needle and string and pulling tight enough to pull the incision together, but NOT to cause an overlap of the skin. See Diagram B for an example of a square knot.



**Diagram B**



9) Trim the suture material to complete the suture.

10) Apply one more simple interrupted suture to close the incision in the chest

### **Part B. She's Crashing!**

Your team has just completed the exploratory open-heart surgery, but the patient is crashing! It appears she may have some internal bleeding caused by a gastric ulcer. Switch surgical team roles and follow the directions below to save her life!

1) The chief surgeon will use the scalpel to make a 1-inch horizontal incision over the left upper quadrant (LUQ) of the abdomen. Do not push too hard! If you puncture or cut any underlying organs you could hurt your patient!

2) Use the forceps to lightly pull the sides of the skin apart to look into the LUQ of the abdominal cavity of the patient. Find the stomach.

What did you find when you opened up the section? \_\_\_\_\_

3) Unfortunately, the stomach is completely ulcerated and a large portion will need to be removed through gastric bypass.

4) Remove the part of the stomach that is visible.

5) Using the directions for suturing in Steps 6-9 in Part A, the assisting surgeon will place two simple interrupted sutures to close the incision in the LUQ.

### **Part C. A Second Heartbeat???**

Your team has just completed the gastric bypass when the nurse notices something strange. As she listens to the abdominal aorta she notices a second heartbeat, and it is getting fainter. Your patient is pregnant and must not have known! You must work fast to save the baby's life. Switch roles again and follow the directions below to save her life!

1) The chief surgeon will use the scalpel to make a 1-inch horizontal incision over the pelvic region. Do not push too hard! If you puncture or cut the fetus you could lose your medical license and harm the baby!

2) Use the forceps to lightly pull the sides of the skin apart to look into the pelvic region and find the fetus.

3) Deliver the baby.

What did you find when you opened up the section? \_\_\_\_\_

4) Using the directions for suturing in Steps 6-9 in Part A, the assisting surgeon will place two simple interrupted sutures to close the incision in the pelvic region.

### **Part D. Whoops!**

Your team has just completed the cesarean section, but when you were moving the patient to a gurney she slipped and slammed her left knee on the floor. X-rays show that the patella is shattered. Switch roles and follow the directions below to remove the bone fragments in her knee.

1) The chief surgeon will use the scalpel to make a 1-inch vertical incision over the left kneecap. Do not push too hard!

2) Use the forceps to lightly pull the sides of the skin apart to look at the knee. Find the patella

What did you find when you opened up the section? \_\_\_\_\_

3) Using the directions for suturing in Steps 6-9 in Part A, the assisting surgeon will place two simple interrupted sutures to close the incision in the knee.

### **Concluding Questions**

1) What is surgery?

2) On what part of the body would neurosurgery be focused? \_\_\_\_\_

3) On what part of the body would dermal surgery be focused? \_\_\_\_\_

4) What is suturing and what are the general goals?

5) Why is it important to use the correct suture technique?

6) What is the difference between synthetic and organic suture material? Explain why it would be better to use organic sutures on internal organs?

7) What is the most common knot used in suturing?

8) What suture technique (stitch) was used in this activity?

9) Name the surgeries were performed in this activity?