

Suturing Basics

Curriculum



This curriculum could not have been done without the help and authorization of:

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His research and documentation in *Principles of Veterinary Suturing* provides the basis for this curriculum. You can find the full documentation at: <http://research.utsa.edu/wp-content/uploads/2015/02/Principles-of-Veterinary-Suturing.pdf>

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This curriculum and accompanying kit will help students learn proper suture techniques.

Curriculum Structure

The *Suturing Basics* curriculum is composed of the following lessons. Approximate lesson times are included.

Lesson	Title	Approximate Time
One	FOCUS: Knowing Terminology	15-20 minutes
One	LEARN: Suture Needles and Techniques	30-40 minutes
One	REVIEW: From Wound to Wrapped Up	30 minutes
	Total	1-1½ hours

Lesson Structure

Each lesson begins with a Lesson Overview, Lesson Objectives and a Lesson at a Glance table that lists lesson activities, materials required, suggested preparation steps and approximate class time.

Lesson Sections

The actual lesson follows the overview, which contains some of the sections described below.

FOCUS

Every lesson begins with a FOCUS activity intended to capture participants' attention. This may be in the form of a small or large class discussion, a game, a demonstration or a review of previous lesson information. During this activity, participants are introduced to the topic of the lesson.

LEARN

The LEARN activity in each lesson varies in its presentation mode. It may be a slide presentation, group activity or demonstration.

REVIEW

The majority of lessons end with a REVIEW activity intended to briefly review the lesson's key messages or main points.

Lesson One – Suturing Basics

Lesson Overview

In this lesson, students will learn how to properly perform sutures.

Lesson Objectives

After completing this lesson, participants will:

- Understand the properties, selection and use of a suture and suturing needle
- Properly tie a knot
- Understand common suture patterns and wound closure
- Properly remove a suture

Lesson at a Glance

Activity	Materials	Preparation	Approximate class time
FOCUS	• <i>Suturing Basics</i> slide presentation • <i>Suture Information Sheet</i> • <i>Types of Sutures – Vocabulary Sheet</i> • <i>Types of Sutures – Activity Sheet</i> • <i>Types of Sutures – Activity Sheet (Answer Key)</i>	1. Prepare <i>Suturing Basics</i> slide presentation (slides 1-5) for viewing 2. Print/photocopy <i>Types of Sutures – Vocabulary Sheet</i> and <i>Types of Sutures – Activity Sheet</i> (one per participant)	15-20 minutes
LEARN	• Suture Kit (recommend 1 suture kit per 1-4 participants) • <i>Suturing Basics</i> slide presentation	1. Prepare <i>Suturing Basics</i> slide presentation (slides 6-32) for viewing	30-40 minutes
REVIEW	• Suture Kits (suture pads and suture tools) • <i>Suturing Basics</i> slide presentation	1. Have <i>Suturing Basics</i> slide presentation available for review as needed	15-20 minutes

Lesson One – Suturing Basics

FOCUS: Knowing Terminology

15-20 minutes

Purpose:

Participants will learn proper terminology for basic suturing tools and procedures.

Materials:

- *Suturing Basics* slide presentation
- *Suture Information Sheet*
- *Types of Sutures – Vocabulary Sheet*
- *Types of Sutures – Activity Sheet*
- *Types of Sutures – Activity Sheet (Answer Key)*

Facilitation Steps:

1. Go over the objectives in slide 3 and the focus on technique for suturing in slides 4 and 5.
2. Once you have gone over the slides, hand out *Types of Sutures – Vocabulary Sheet* and *Types of Sutures – Activity Sheet* to each participant.
3. Give participants 5-10 minutes to fill out the *Activity Sheet* using the *Vocabulary Sheet*.
4. Collect and correct or go over in class (instructor's choice).

Name: _____ Class: _____

Types of Sutures – Vocabulary Sheet

Physical Construction of Suture

A suture is any strand of material used to approximate tissue edges and give artificial support while the tissue heals naturally. There are three things to consider when determining a type of suture. This information should be indicated somewhere on the packaging of the suture:

1. Absorbable or non-absorbable
2. Natural or synthetic
3. Braided (multifilament) or monofilament

ABSORBABLE

Absorbable sutures are designed to break down over a specific timeframe and be absorbed by the body. They are used when temporary support is required and the healing tissue will eventually support itself. Absorption occurs by phagocytosis and proteolysis in a natural suture, and by hydrolysis in a synthetic suture.

NON-ABSORBABLE

Non-absorbable sutures are designed to either be left permanently in the body or be removed after a certain healing period. Permanently placed, non-absorbable sutures are generally used in tissue where, even though healing may occur, the new tissue may never have the needed strength to support itself. The effective tensile strength of such sutures remains high over time. When used to close skin, non-absorbable sutures are usually removed in 10-14 days, but this may vary by location and situation.

NATURAL SUTURE MATERIALS

Natural sutures are made from animal or plant materials. Their protein composition can elicit the most pronounced tissue reaction (inflammation) of any suture material. Their useful strength in tissue varies from a few days with plain catgut to several months for silk and can vary by individual.

SYNTHETIC SUTURE MATERIAL

Sutures can be made from synthesizing a wide variety of polymers. Synthetic materials cause less tissue reaction than natural fibers. Therefore, their strength as well as absorption rate for absorbable sutures is more uniform and predictable in every individual.

BRAIDED (MULTIFILAMENT)

This construction involves several filaments (or strands) being braided or twisted together. This results in a strong suture that is flexible and easy to handle. Multifilament sutures pass less easily through tissue than smooth monofilaments and the resulting "tissue drag" can cause tissue trauma. Suture manufacturers have addressed this issue by coating many of the braided sutures, thus reducing the degree of "tissue drag." The surface of a suture must be compatible with specific tissue application and have the desired knotting characteristics and capabilities. A rough suture surface can cause trauma and cutting of surrounding tissues,

both of which are undesirable. Therefore, selection of materials should consider both the structure of the tissue and the surface of the suture. In principle, a suture with a rough surface can be tied with fewer knots than one with a smooth surface, as knots are less likely to slip. Care must be exercised with the tying of all types of sutures.

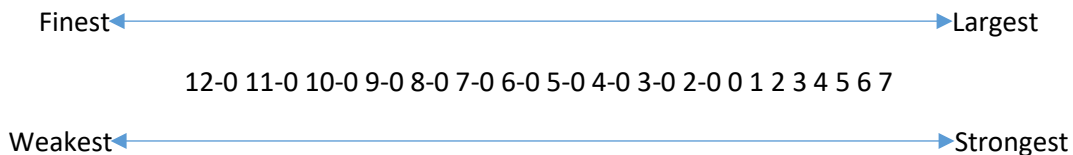
MONOFILAMENT

This type of suture construction results in a single strand or filament. The surface is very smooth and passes easily through tissue, but they can be difficult to handle and tie, as they are less flexible than braided sutures. Most monofilaments also have “memory.” This memory results in a suture that holds the shape it had in the package, making it more difficult to work with. Some memory can be relaxed, but it is not effective in all sutures.

SUTURE SIZING

Sutures are available from a "7" (heaviest) to "12-0" (finest). The most important factor in deciding suture size is the relationship between the tensile strength of the suture and the tissue to be sutured. The tensile strength of the wound need only match or slightly exceed the holding power of the tissue to be sutured. For example, you do not need a rope to tie your shoes; it might work, but it's overkill. A shoelace would do. Finer diameter sutures make smaller knots, provide less tissue reaction, and result in minimal scar formation.

Finer strands are very flexible and easy to handle, but require gentle tying. Closely placed, fine sutures create a stronger suture line than widely spaced, heavy sutures. Tissue drag is also closely related to gauge; the finer the gauge, the less tissue trauma is caused by the passage of the suture.



SKIN SUTURE SELECTION

The skin is one area where the final result, based on your selection of suture and your technical skill, will be the most evident to your patient (or client if it is a pet). Make informed choices that will give the best result possible; stitches that are tied too tight and are left in too long may leave “hatch marks” on either side of the scar. The hole made by the stitch may rip and become larger with increased tension on the wound (i.e. swelling). Sometimes these marks are more noticeable long term than the scar itself.

Name: _____ Class: _____

Types of Sutures – Activity Sheet

Using the *Types of Sutures – Vocabulary Sheet*, add the missing information on each type of Suture.

ABSORBABLE:

1. Absorbable sutures are designed to do what?
2. What absorbs the suture?
3. Absorbable sutures are used when temporary support is required and healing tissue will eventually _____.

NON-ABSORBABLE:

1. Non-Absorbable sutures are designed to be left in permanently in the body or removed after _____.
2. When used to close skin, what is the average number of days before nonabsorbable sutures can be removed?
3. Permanently-placed sutures are used where new tissue may never have _____.

NATURAL SUTURE MATERIALS:

1. What are natural sutures made from?
2. What can their protein composition elicit or bring forth more what than any other suture?
3. How long can plain catgut suture strength last?

4. How long can silk suture strength last?

SYNTHETIC SUTURE MATERIAL:

1. Synthetic materials are better than natural fibers in what way?
2. What is the difference in strength and absorption rate for synthetic sutures compared to natural sutures?

BRAIDED (MULTIFILAMENT)

1. Why is this suture called “braided?”
2. What are some of the results of this material?
3. What is the issue called when these sutures pass less easily through the tissue?
4. Why is this issue bad? What can it cause?
5. Which tissue surface can cause more trauma, rough or smooth?
6. In principle, which tissue surface is most likely to have knots slip, rough or smooth?

MONOFILAMENT

1. How many strands or filaments are in a monofilament suture?
2. The surface can be smooth and easy to pass through tissue, but what is one difficulty of this type of suture?
3. What is memory in monofilament?

SUTURE SIZE:

1. What is considered the heaviest suture size?
2. What is considered the finest suture size?
3. What does tensile strength mean for sutures?
4. Finer strands have some good qualities. Name two of them.
5. What is less likely to happen due to the passage of the suture as the gauge becomes finer?

Types of Sutures – Activity Sheet (Answer Key)

Using the *Types of Sutures – Vocabulary Sheet*, add the missing information on each type of Suture.

ABSORBABLE:

1. Absorbable sutures are designed to do what?
Break down over a specific timeframe and/or be absorbed by the body
2. What absorbs the suture?
The Body
3. Absorbable sutures are used when temporary support is required and healing tissue will eventually support itself.

NON-ABSORBABLE:

1. Non-Absorbable sutures are designed to be left in permanently in the body or removed after a certain healing period.
2. When used to close skin, what is the average number of days before nonabsorbable sutures can be removed?
10-14 Days
3. Permanently placed sutures are used where new tissue may never have the strength to support itself.

NATURAL SUTURE MATERIALS:

1. What are natural sutures made from?
Animal or plant material
2. What can their protein composition elicit or bring forth more what than any other suture?
Tissue Reaction (inflammation)
3. How long can plain catgut suture strength last?
A few days
4. How long can silk suture strength last?
Several Months

SYNTHETIC SUTURE MATERIAL:

1. Synthetic materials are better than natural fibers in what way?
Cause less tissue reaction
2. What is the difference in strength and absorption rate for synthetic sutures compared to natural sutures? They are more uniform and predictable

BRAIDED (MULTIFILAMENT)

1. Why is this suture called Braided?
Several filaments or strands are braided or twisted together

2. What are some of the results of this material?
Flexible and easy to handle
3. What is the issue called when these sutures pass less easily through the tissue?
Tissue drag
4. Why is this issue bad, what can it cause?
Can cause tissue trauma
5. Which tissue surface can cause more trauma, rough or smooth?
Rough
6. In principle, which tissue surface is most likely to have knots slip, rough or smooth?
Smooth

MONOFILAMENT

1. How many strands or filament are in a monofilament suture?
single
2. The surface can be smooth and easy to pass through tissue, but what is one difficulty of this type of suture?
Difficult to handle and tie
Less flexible
3. What is memory in Monofilament?
Holds the shape it had in the package, making it more difficult to work with

SUTURE SIZE:

1. What is considered the Heaviest suture size?
7
2. What is considered the finest suture size?
12-0
3. What does tensile strength mean for sutures?
Holding power of the tissue to be sutured
4. Finer strands have some good qualities, name two of them.
Very flexible, easy to handle, do not require gentle tying
5. What is less likely to happen due to the passage of the suture as the gauge becomes finer?
Tissue trauma

Lesson 1 - Suturing Basics

LEARN: Suture Needles and Techniques

30-40 minutes

Purpose:

Participants will work in groups using the Realityworks Suture Kits. Have groups of 2-4 depending on the number of Suture Kits per group (we recommend no more than 4 people using one suture kit in a group format).

Materials:

- Suture Kit (recommend 1 suture kit per 1-4 participants)
- *Suturing Basics* slide presentation

Facilitation Steps:

This participant activity is split up into two sections:

- Slides 6-19: Suturing Needles and Basic Suturing Technique
- Slides 20-32: Suture Knots and Suture Removal

As you go over the slide presentation, have the participants lay the Suture Kits out in front of them and follow the proper technique while the presentation slides are being explained. The way this lesson is laid out is as follows:

Slides 6-19: Suturing Needles and Basic Suturing Technique:

1. Present the slides (slides 6-19).
2. Have participants use the suture kits and suture tools to replicate what was just completed during the presentation.
3. Go back to specific slides and reteach skills as needed.

Slides 20-32: Suture Knots and Suture Removal:

4. Present the slides (slides 20-32).
5. Have participants use the suture kits and suture tools to replicate what was just shown during the presentation.
6. Go back to specific slides and reteach skills as needed.

Lesson One - Suturing Basics

REVIEW: From Wound to Wrapped Up

15-20 minutes

Purpose:

Participants will put everything they have learned together. Each participant in every group should take the time to do one complete suture from beginning to end.

Materials:

- Suture Kits (suture pads and suture tools)
- *Suturing Basics* slide presentation

Facilitation Steps:

1. Start with a fresh cut on the suture skin and have participants complete a suture from start to finish.
2. Have participants show their group and discuss the technique they used.
3. Have participants practice doing sutures that they were shown in the Learn section of this lesson.
4. This can be a graded assessment or the start of participants doing continual practice on gaining speed and accuracy.