

# SURGERY PRACTICAL SKILLS ASSESSMENT

ALL veterinary student volunteers, who plan on participating in surgery, will be required to take a practical examination at the start of each trip. The exam will be done on simple phantoms that volunteers can use at home for practice.

## Recommended practice materials:

- 1/2 or 5/8 inch rubber or plastic tubing (can be found at most hardware stores or lab supplies)
- A blue or green surgical huck towel
- A 6-10 inch long piece of 1/8 inch cord
- Monofilament suture material (2-0 or 3-0) or nylon fishing line (~ 20 gauge)
- Basic instruments (pair of needle holders, curved mosquito or Kelly hemostat, and thumb forceps).

As RAVS clinics use monofilament suture (PDS, Monocryl, Monomend, etc) it is a good idea to practice with either outdated pieces of these suture types or nylon fishing line. The actual test will be done using 2-0 or 3-0 Monomend with a swaged FS-1 needle.

The Banfield, Ethicon or other practice boards are fine, though the Banfield one only provides suture practice and the Ethicon only ligation practice. Of course nothing is the same as real skin or tissue, but it is unethical to do surgery without practicing all you can, and mastering basic skills, on phantoms first. The simple materials suggested here, and used in the test, will provide you an excellent and inexpensive opportunity to develop the basic skills, without which you cannot be an effective surgeon.

## Tips for successful preparation:

- Practice until the procedures become spinal reflexes. Just “figuring out” a procedure is not sufficient.
- You will be nervous during the exam. So, once you become adept at technique, practice in distracting situations (have a TV or radio on, or others watching, for instance). Just remember: You will be MORE nervous during surgery.
- Practice in a standing position, as that will be the position in which you will be doing surgery.
- Keep your back straight and your elbows at your sides. If you can't do these simple procedures in that position, you have to practice more.

## PRACTICAL EXAM DESCRIPTION

The following are the specifics of what will be on the practical examination, along with practice hints. Refer to the Surgery Basics page and referenced required reading for details on these procedures.

1. **LIGATURE:** You will be required to tie a ligature using Monomend suture material on a piece of latex tubing. You will use an instrument tie and may use either a Surgeon's knot or a Modified Miller's knot, with at least 4 “throws” (half hitches). Each throw should lie parallel to the preceding one, making a series of square knots and avoiding the slip knot effect (and no “grannies”). The final knot must be tight on the tubing. The short end of the knot should be no longer than 4 inches before the ends are cut.

To pass: The procedure must be completed in 30 seconds, the ligature must be tight on the tubing, and there must be at least one good square knot in the 4 throws completing the knot.

Practice hints:

- a. Practice tying ligatures with the tubing at different angles to your body. You will be tested standing, with the phantom on a surgery table, the tubing perpendicular to your shoulders but you never know what angle you might be in when trying to control hemorrhage.
  - b. Learn how to pass suture around a pedicle (in this case the tubing) with an instrument. This allows better visualization when working on small patients. You can use either your needle holders or a curved Kelly or mosquito. I prefer the latter on cats and pediatrics.
  - c. Learn how to keep track of your suture. Monofilament has “memory” and will fall out of the sterile field or slip away when you are trying to grasp it if you don’t learn how to keep it gathered in your hand. This is where many students lose most of their time.
  - d. Pass the end of the suture **without** the needle around the tubing (“pedicle”). The needle-less end is used for ligating. This is much easier and avoids inadvertent laceration of tissues with the needle.
  - e. Train yourself to make a good “square knot” every time you add a throw. This is done by having your hands going in the right direction (which **MUST** become a reflex - if you have to think about it you haven’t practiced enough) and pulling evenly on both ends of the suture as the throw is tightened.
  - f. To avoid excessively long tails (which waste suture and make knot tying difficult) pull evenly on both ends of the suture only for the last few millimeters before the throw becomes tight. Most people want to pull harder with their “dominant” hand.
  - g. Pull your first throw (Surgeon or Miller’s) really tight and watch it to make sure that it doesn’t slip and release tension as the second throw is placed. This is **THE** most common cause of ligature failure.
2. **SIMPLE CONTINUOUS PATTERN / SQUARE KNOT:** You will make a 2.5 inch simple continuous suture pattern using a square knot with a total of 4 “throws” to start and end the pattern. The phantom will be a standard surgical towel. You will be using Olson-Hagar needle holders (the ones with the cutting surface behind the holding jaws) and may use either rat tooth or Brown-Adson thumb forceps to handle the “tissue”.

To Pass: You will have to complete this exercise in 3 minutes. The final product should have sound tight knots at both ends and apposed towel edges without overlapping. Sutures should be spaced 1/4 inches apart and 1/4 inch from the edge of the “incision”

Practice hints:

- a. It is generally easier for right handed people to suture right to left and lefties to go left to right. Stand so that your shoulders are parallel to the line of sutures.
- b. Grasp your needle so that it is perpendicular to the needle holder and get in the habit of resetting your needle in the needle holders accurately every time. Much time is wasted by having to readjust your needle grip several times before each stitch.
- c. Pay attention to the same issues of suture control and knot tying mentioned under ‘ligatures’.
- d. When tying square knots keep both hands in the same plane as once they are in different planes it is easy to pull with unequal tension and pull it into a granny. Also, keep your hands close to the body wall. The farther they are away from the body wall, the easier it is to get hands out of the same plane, the greater the chance of losing control of the suture material.
- e. Olson-Hagar needle holders don’t accidentally cut sutures. Surgeons who aren’t paying attention or are clumsy cut sutures accidentally with Olsen-Hagars. Pay attention and don’t be clumsy.
- f. To get good wound edge apposition, make sure that you are taking the same sized “bite” on each side of the wound edge. Practice this using bites from 1/8 inch to 1/2 inch. Space your stitches evenly from 1/8” to 1/2” apart.
- g. When tying the end knot in a continuous pattern, be sure to grasp the loop in the center to avoid difficulties in making your knot.
- h. You may pick up your needle following each stitch with your fingers, Brown-Adsons, or needle holders. Each technique has advantages and disadvantages, which we will discuss in rounds. Try all techniques, but pick one, practice and learn it.

3. **FIGURE-8 KNOT:** RAVS clinics use the “figure 8” knot (also called a “clove hitch”) for ligating the cord on cat castrations. Fossum’s book has a good diagram of this and there is a good demonstration in the slide show on this web site. You will be tested on a 6 inch piece of 1/8 inch cord. One end of the cord will be attached to a board (to simulate the cat). The other end will have a knot tied in it to simulate the testis. You will tie the knot in the cord with a curved mosquito or Kelly.

To Pass: You will have 15 seconds to complete the knot in the clove hitch or figure 8 configuration.

Practice hints:

- a. You should practice the hand motions in this technique until you don’t have to watch your hands.
- b. The most common problem in using these cord ligation techniques is that novice surgeons try to tie the knot too close to the testis, rather than using all the exposed cord and tying close to the animal.

This is a complete description of the test. It will be simple and short (around 5 minutes). You will be closely observed and you will be nervous. So practice a lot! We are going to insist that only those who do well on the practical exam participate in surgery on any level. We want you to learn these techniques and become proficient, but you have to do the preparation and can not put it off until the week before the trip. You cannot successfully “cram” for a surgery practical!

IF YOU HAVE QUESTIONS ABOUT ANY OF THESE TECHNIQUES OR HOW TO LEARN THEM PLEASE CONTACT DR. DAVIS WELL BEFORE YOUR SCHEDULED TRIP! ([edavis@ravsmail.org](mailto:edavis@ravsmail.org)).

Video demonstrations of components of this practical exam are available on the HSVMA-RAVS website. ([http://www.ruralareavet.org/training\\_av.php](http://www.ruralareavet.org/training_av.php))