

SOP: Placing an Intravenous Catheter in Dogs and Cats

These SOPs were developed by the Office of the University Veterinarian and reviewed by Virginia Tech IACUC to provide a reference and guidance to investigators during protocol preparation and IACUC reviewers during protocol review. They can be used as referenced descriptions for procedures on IACUC protocols. However, it is the sole responsibility of the Principal Investigator to ensure that the referenced SOPs adequately cover and accurately represent procedures to be undertaken in any research project. Any modification to procedure as described in the SOP must be outlined in each IACUC protocol application (e.g. if the Principal Investigator plans to use a needle size that is not referenced in the SOP, simply state that alteration in the IACUC protocol itself).

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I. Procedure Summary and Goal

- a. The purpose of this procedure is to familiarize the individual with placement of a peripheral intravenous (IV) catheter into commonly utilized sites.
- b. IV catheterization is a common procedure in veterinary medicine used for the administration of various therapeutic materials as well as collection of diagnostic samples.
- c. IV catheterization reduces the amount of trauma a patient is subjected to by eliminating repeated venipuncture.

II. Personal Protective Equipment and Hygiene

- a. Hands should be washed thoroughly or sanitized before and after venipuncture.
- b. Personal protective equipment appropriate to the setting should be used.

III. Supply List

- a. Syringe(s), 3-6ml
- b. Heparinized saline or saline flush
- c. Sterile hypodermic needle, 20-22 gauge, 1 inch length
- d. Clippers and #40 clipper blade
- e. 70% isopropyl alcohol
- f. Betadine or chlorhexidine scrub
- g. Appropriate sized intravenous catheter
 - i. 22-24-gauge for puppies and kittens
 - ii. 22-20-gauge for cats and small dogs
 - iii. 22-18 gauge for medium sized dogs
 - iv. 20-18 gauge for large dogs
- h. T-set adaptor or injection cap
- i. Porous white tape

IV. Detailed Procedure

- a. Laboratory Procedure
 - i. Do not hold animals off of food.
 - ii. Sedation (given if needed)
 1. Moderate sedation will result in an animal that is still able to respond to stimuli.
 2. See Sedation and Anesthesia SOP
- b. Sites for IV catheterization
 - i. Dog
 1. Cephalic vein
 2. Lateral saphenous vein
 - ii. Cat
 1. Cephalic vein
 2. Medial saphenous
- c. Prepare the site
 - i. Place the animal in sternal or lateral recumbency.
 1. Your assistant should maintain the animal in this position.
 - ii. Clip the haired skin overlying the site for IV catheterization.
 1. #40 clipper blade
 - iii. Aseptically prepare the site using alternating betadine (or chlorhexidine) scrub and alcohol
 1. See Sterile Prep SOP

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- iv. Stabilize the vein without touching the aseptically prepared skin.
 1. Wear exam gloves.
 2. Pull the skin taught just ventral to the catheterization site.
 3. Your assistant should be occluding the vein by placing pressure over the vein proximal to the catheterization site.
 4. Insert the catheter with needle at a slight angle to facilitate entry through the skin into the vein.
 - a. A pilot hole may be made by using a needle to “prick” the skin at the site of insertion.
 - b. Insert the catheter with the bevel of the stylet facing away from the vein
 5. Once blood is observed in the hub of the needle, hold the needle in place while advancing the catheter off the needle and into the vein.
 6. Remove the needle from the catheter and place an injection port or T piece adapter on the end of the catheter.
 7. Secure the catheter in place.
 - a. Using ½-inch wide porous white tape, place a strip with the adhesive side facing up on the underside of the catheter hub with a tag of about 1.5cm left to the side of the catheter.
 - b. Fold the tag snugly over the catheter hub and wrap the remaining tape around the animal’s limb.
 - c. Follow with 2 additional wraps of 1-inch wide white porous tape; beginning distal to the catheter, under the hub and wrapping around the leg to continue proximally over the catheter hub.
 - d. Wrap another 1-inch wide piece distally under the catheter hub. Be sure that the distal wrap is wide enough to prevent the injection cap from contacting any skin or hair.
 - e. A successfully secured catheter should prevent any movement of the catheter in or out of the vein.
 8. Once the catheter has been secured in place, ensure it is still properly placed within the vein by injecting heparinized saline or saline through the injection, or T-piece adapter port and feel/watch for subcutaneous leakage.
 - a. You can also gently palpate the vein proximal to the catheter insertion site and feel the saline as you are pushing it into the vein.
 9. Each student will be permitted 2 attempts to place and secure a catheter.

V. Variations

- a. Pre-operative Procedure
 - i. Withhold food from the animals for 12 hours prior to the procedure.
 - ii. See Sedation and Anesthesia SOP for pre-medications and general anesthesia.
 - iii. Supportive Care
 1. Heating pads and blankets will be used to maintain rectal temperature > 96°F during the procedure.
- b. Post-operative Procedure
 - i. The animals will be monitored after the removal of all IV catheters.
 - ii. Heating pads and blankets may be utilized until a rectal temperature of $\geq 99^{\circ}\text{F}$ is recorded and the animal able to ambulate from MDL 3 to its housing area.

VI. Potential Adverse Effects, Mitigation, or Treatment

- a. Hematoma at the IV catheter site
- b. Phlebitis/thrombophlebitis
- c. Infection at the IV catheter site
- d. Severance of a portion of IV catheter in vein
- e. Avoidance Measures:
 - i. Use appropriate size catheter for size of vessel, hold compression over catheter site when removed, use sterile prep at site and sterile technique for placement, once needle has been removed do not re-insert into catheter while catheter is in the vein.

VII. Links to Multimedia Aids and References

- a. <http://www.abbottanimalhealth.com/veterinary-professionals/education/fluid-therapy/instructional-videos.html>