



Standard Operating Procedure: Colonoscopy in Dogs

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 Goals

- a. Visualization and biopsy of the colon is useful in the diagnosis of various gastrointestinal diseases.
- b. The goal of this laboratory is to teach veterinary students or veterinarians how to properly perform colonoscopy and to recognize the normal endoscopic anatomy of the large bowel.

II. Personal Protective Equipment and Hygiene

- a. Hands should be washed thoroughly or sanitized before and after the procedure.
- b. Personal protective equipment appropriate to the setting should be used.
- c. Exam gloves
- d. Lab or clinical coat or smock

III. Supply List

- a. UGI Endoscope/ processor / monitor
- b. Flexible biopsy forceps
- c. Biopsy foam cassette
- d. Orogastric tube
- e. Enema tube
- f. Sterile lube
- g. Tape roll
- h. Roll gauze
- i. Orogastric funnel
- j. 60 mL syringe
- k. Appropriate drugs/fluids
- l. See referenced SOPs for additional required supplies

IV. Detailed Procedure

- a. Pre-Procedural Instructions
 - i. Fast the dogs for at least 12 hours (from 8am the day prior to the procedure).
 - ii. 12-24 hours prior to the procedure, administer 0.2mg/kg of metoclopramide or 1 mg/kg maropitant subcutaneously.
 1. Please refer to SOP: Injections in Dogs and Cats.
 - iii. Wait 15-30 minutes, and then administer 60 mL/kg of Golytely via orogastric intubation.
 1. Placement of an orogastric tube

- a. Measure the tube from the incisor teeth to the animal's 13th rib and mark the length with tape.
 - b. Place a roll of tape or other suitable oral speculum within the animal's mouth and secure it in place with roll gauze around the muzzle.
 - c. Restrain the animal in a sitting position with the head gently flexed and pass a lubricated orogastric tube into the pharynx, through the esophagus, and into the stomach.
 - d. Palpate the cervical region proximal to the thoracic inlet to feel 2 tubes (the orogastric tube and the trachea) to determine if the tube has been properly placed.
 - e. Administer the calculated amount of Golytely into the tube through a 60 ml syringe barrel used as a funnel.
 - f. Make sure air is not introduced into the stomach during administration of the Golytely.
- iv. Enema
1. 20ml/kg of warm water
 2. Measure the enema tube from the anus to the 13th rib and mark the length.
 3. Insure the tube is well lubricated and gently pass it into the descending colon.
 4. Never force the tube if it doesn't go easily.
 5. Administer the calculated enema volume over 2-3 minutes.
- v. Repeat the administration of the Golytely and the enema 2 hours later.
1. Metoclopramide does not need to be repeated.
- vi. Repeat the enema the morning of the procedure.
- b. Colonoscopy
- i. Four to six students will have 10-15 minutes each to perform the colonoscopy in one 2-hour lab.
 1. Four to six additional students will each have 10-15 minutes to perform endoscopy in the next 2-hour lab.
 2. There will be one instructor per 1-2 dogs.
 - ii. Check the endoscope machine
 1. Insure sure the endoscope is functional and all flushing fluids have been filled.
 - iii. Sedate and anesthetize the animal according to the Sedation and Anesthesia SOP.
 - iv. Place the animal in left lateral recumbency
 1. Place the dogs on a cage pad with a warm water blanket beneath, and a Bair Hugger warmer on top throughout the procedure.
 - v. Advance the endoscope tip 2-3 cm into the anus while another person gathers the perianal tissue and compresses them around the endoscope to create an air-tight seal.
 - vi. Insufflate the colon with air.

1. As the colonic lumen distends, slowly advanced the endoscope keeping the endoscope centrally located within the lumen.
 - vii. The endoscope can be slowly advanced into the cecum in both dogs and cats, or the ileum in dogs only.
 - viii. The assistant can let go of perianal tissue when the endoscope is within the transverse colon, but must grip the perianal tissue as the endoscope is withdrawn into the mid descending colon.
 - ix. After the endoscope has been fully advanced, it is slowly withdrawn, visualizing the entire circumference of the colonic lumen.
 - x. After reaching the anus, the endoscope is advanced 15 cm, retroflexed 180o, and withdrawn to visualize the most distal 1-3 cm of rectum.
 - xi. Biopsy samples may be collected using flexible forceps passed through the endoscope's operating channel.
 1. One or two samples may be taken by each student from the ileum, cecum, ascending colon, transverse colon, or oral, mid, or distal descending colons.
- c. Post-Procedural Instructions
- i. Straighten the endoscope and gently remove it from the animal.
 - ii. Routinely recover the animals from anesthesia according to the Sedation and Anesthesia SOP with heating pads as described above.
 - iii. Return the dogs to their runs when they can walk.
 - iv. Feed the dogs 50% of their daily ration 4 hours post-recovery if they are judged to be awake and capable of safely eating.
 - v. Feed as normal the day following the procedure.

V. Potential Adverse Effects, Mitigation, or Treatment

- a. Gastrointestinal perforation
 - i. This is a rare complication that is usually diagnosed during the procedure by distention of the abdomen, after air has been removed from the colon. Animals should be taken to the Veterinary Teaching Hospital for treatment or for euthanasia by pentobarbital overdose intravenously (IV) depending on the policies of the Multidisciplinary Laboratory (MDL), the Teaching and Research Animal Care Support Service (TRACSS) and the Institutional Animal Care and Use Committee (IACUC).
- b. Vomiting and aspiration of Golytely
 - i. Serious aspiration pneumonia is an infrequent event.
 - ii. Animals should be taken to the Veterinary Teaching Hospital for treatment or for euthanasia by pentobarbital overdose intravenously (IV) depending on the policies of the Multidisciplinary Laboratory (MDL), the Teaching and Research Animal Care Support Service (TRACSS) and the Institutional Animal Care and Use Committee (IACUC). Complications of administration of an enema are uncommon.

- iii. Trauma to the rectal or colonic mucosa may lead to hemorrhage.
 - 1. Usually this is minor and requires no treatment.
- c. Avoidance Measures
 - i. Only advance the endoscope when the lumen can be visualized.
 - ii. When giving Go-lytely make sure the orogastric tube is in the esophagus by 1) measuring and marking the distance from the incisor teeth to the last rib and inserting the tube this far, 2) palpating the tube in the esophagus in the cervical region, 3) administering the liquid slowly enough to prevent rapid gastric distension, 4) preventing more than a small amount of air to be placed into the stomach, 5) crimping the tube and removing quickly to prevent fluid left in the tube from entering the pharynx upon removal when administration is complete or the dog vomits.
 - iii. Advance the enema tube gently with an appropriate amount of lube with gentle repositioning if resistance is noted.

VI. Links to multimedia aids and References

- a. <http://www.ncbi.nlm.nih.gov/pubmed/15515578>
- b. <http://www.youtube.com/watch?v=9e-NjflvFHI>
- c. <http://www.youtube.com/watch?v=u5wKHhVPMFM>