

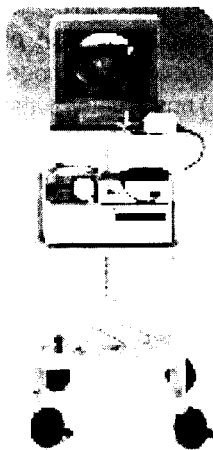
# ENDOSCOPY IN VETERINARY PRACTICE

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## INTRODUCTION

Endoscopy comes from the Greek word "scopy," meaning "look" and "endo," meaning "within". Endoscopy allows a visual examination of internal organs and body parts without invasive exploratory surgery. It was first described in the early 1800's, but it was not until the late 1800's that optical lenses were developed which could be used in viewing devices and endoscopy could start to be used.



Endoscopy is performed with either a rigid or flexible fiberoptic instrument. Flexible endoscopes such as those used in the examination of the stomach consist of a long, flexible insertion tube with a bending tip at the end that enters the body, an eyepiece, and a control section. The tip of the endoscope is manipulated using a control knob in the hand piece. In addition to the fiber bundles, which provide the light source, two channels are present within the endoscope. One channel permits various endoscopic tools to be passed and fluids to be suctioned

or samples taken. The other allows air or water to be passed into the stomach/intestine to insufflate (inject air into the area), or wash away mucus from the viewing port. Special video cameras can be attached to the endoscopes, which allow viewing of the exam on a television screen, as well as recording the exam on video. The rigid endoscope cannot be used in some areas, such as the stomach because it does not have the bending tip, so it cannot be flexed to allow examination of all parts of the stomach.

## TYPES OF ENDOSCOPY INCLUDE:-

### FLEXIBLE ENDOSCOPY:

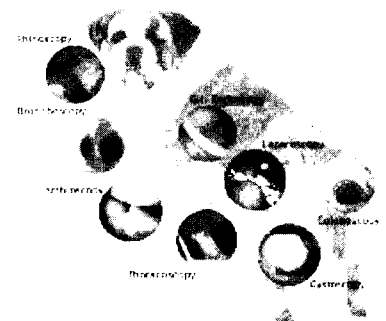
- **BRONCHOSCOPY:** an exam of the lower airways. Bronchoscopy and Tracheoscopy may be indicated in certain cases of bronchitis, coughing, pulmonary

neoplasia, tracheal collapse, stridor and other abnormal breathing patterns. Bronchio-alveolar lavage (BAL) can be collected through bronchoscopes and examined to diagnose various respiratory diseases. Flexible endoscopes typically used for tracheobronchoscopy include the 5.0 mm Small Animal Bronchoscope with 2.0 mm channel, and the 2.5 mm Specialty Fiberscope with 1.2 mm channel.

- **COLONOSCOPY:** an exam of the transverse colon, ascending colon, cecum, large bowel, and rectum.

- **ENDOSCOPY:** an exam of the *esophagus*, stomach, and upper intestines.

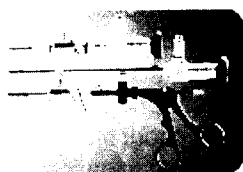
### RIGID ENDOSCOPY:



Some of the more common applications of rigid endoscopy include arthroscopy, urethroscopy, cystoscopy, laparoscopy, proctoscopy, rhinoscopy, thoracoscopy, otoscopy, vaginoscopy and avian endoscopy

- **ARTHROSCOPY:** an exam of soft tissue structures and joint cartilage, which is not visible on radiographs. Decreased damage to the joint and shortened recovery times are two advantages of arthroscopy over arthrotomy. Disadvantages include its limitation during diagnostic and

corrective surgical procedures in small patients. Arthroscopy is rapidly gaining popularity for both diagnosis and surgery in dogs with chronic lameness, joint pain, joint instability, swelling, crepitus and abnormal radiographic findings, including osteo chondral lesions, degenerative joint disease and fragmented coronoids. A variety of telescopes ranging from 1.9 mm to 2.7 mm in diameter is used. The most popular telescope, due to its versatility, is the 2.7 mm Multipurpose Rigid Endoscope.



- **URETHROCYSTOSCOPY:** an examination of the vagina, urethral opening, urethra, bladder, and ureteral openings. Urethrocystoscopy is indicated in a large number of small animal patients, including those presenting with chronic cystitis, pollakiuria, hematuria, stranguria, incontinence, trauma, calculi, and abnormal radiographs. Performing urethrocystoscopy in the variety of patients we see in small animal practice requires more than one endoscope.

The most popular small animal cystoscope is the Multipurpose Rigid Endoscope. Use of this telescope for cystoscopy in males requires either a perineal urethrostomy, or the transabdominal approach. The transabdominal approach may also be indicated in females where urethral diameter is too small. A variety of sheaths and cannulas are recommended for use with this telescope, depending on the anatomical approach.

- **LAPAROSCOPY:** an exam of the abdominal cavity performed through a small incision in the wall of the abdomen or through the navel. The most common indication for Laparoscopy in the dog today is biopsy of the liver, kidney, pancreas, or masses. Other diagnostic applications include evaluation of abdominal trauma, bile duct patency, response to therapy, splenoportography or abnormal radiographic findings. Laparoscopic surgery is also being performed currently, including adrenalectomy, gastropexy, hernia repair and ovariohysterectomy. The most common Small Animal Laparoscope and associated hand instruments have a diameter of 5 mm. However, almost any size rigid telescope may be used for small animal laparoscopy, including the 2.7 mm Multipurpose Rigid Endoscope and standard human laparoscopes, which are 10 mm in diameter.

- **PROCTOSCOPY:** an exam of the large bowel and rectum.

- **RHINOSCOPY:** an exam of the nasal cavity and nasopharynx. Rhinoscopy may be indicated in dogs and cats with nasal discharge, nasal obstruction, chronic sneezing, epistaxis, facial distortion, nasal pain, acute severe sneezing, reverse sneezing and abnormal radiographs. Both rigid and flexible endoscopes may be used for rhinoscopy. Rigid lens system, such as the Multipurpose Rigid Endoscope offer the best optics, while flexible endoscopes with tip deflection permit post-rhinoscopy (visualization of the posterior nasal cavity by passing the insertion tube orally into the nasopharynx and retroflexing the tip 180 degrees). Flexible endoscopes commonly used for small animal rhinoscopy include the Specialty Fiberscope and the small animal bronchoscope.

- **THORACOSCOPY:** an examination of the chest cavity. Indications may include pleural effusion, pericarditis, pleural or pericardial effusion, mediastinal disease, abnormal radiographs findings, biopsies and culture. Much excitement has recently centered around the development of techniques for thoracoscopic pericardial resection in dogs.

- **OTOSCOPY:** an examination of the external ear canal.

- **VAGINOSCOPY:** Indications for Vaginoscopy and Colposcopy (endoscopy of the cervix) include vaginal discharge, bleeding or masses, trauma, incontinence, foreign body removal and stranguria. Reproductive indications include transcervical artificial insemination, dystocia, and monitoring of the estrous cycle. A 2.7 mm Multipurpose Rigid Endoscope is ideal for many of these procedures. In order to reach the cranial pole of the bladder in larger bitches, and for artificial insemination, an extended length telescope of 3.5-4.0 mm in diameter is recommended.

## ENDOSCOPY IN VARIOUS SPECIES

Cattle: Theloresectoscope is a teat endoscope with integrated electrosurgical working element for minimally invasive teat surgery and diagnostics in the standing cow. The new instrument set

makes it possible to enter the teat via the teat canal or with a lateral single puncture approach. With either approach, visual examination can be performed as well as the resection of tissue that occludes the teat canal.

**EQUINE:** Arthroscopy and laparoscopy are frequently used in the diagnosis and treatment of various disorders in this species.

**AVIAN AND EXOTIC SPECIES:** The multipurpose rigid endoscope is used to study avian anatomy and to collect endoscopic biopsy for disease diagnosis in various exotic species including reptiles.

**SMALL MAMMALS:** The Multipurpose Rigid Endoscope is perfectly suited for thorough examination of the relatively inaccessible oral cavity in these animals. It permits complete examination of the gingiva, tongue, all the teeth, both lingual and buccal aspects, the palate, oropharynx, and the larynx. Such an exam may detect very subtle dental abnormalities, such as the cryptic dental points, which may develop subgingivally on chinchillas.

**PISCES:** Once appropriately restrained, either physically or chemically with parenteral or immersion-type agents, the fish is quite amenable to endoscopic examination. Laparoscopy is relatively easily performed following gaseous insufflation of the coelomic cavity. The rigid endoscope is also ideally suited for examination of the gill filaments and oral cavity of most fishes.

**Indications for piscine endoscopy:**

- collection of diagnostic specimens such as organ biopsies, brush cytology, and microbiologic specimens
- therapeutic procedures, such as parasite removal
- identification of sex and reproductive status

**Indications of gastrointestinal endoscopy (Small animals)**

Upper and Lower Gastrointestinal Endoscopy are perhaps the most widely indicated applications

of endoscopy in small animals. Candidates for endoscopy of the upper gastrointestinal tract include those with a stricture or foreign body in the esophagus. Symptoms, such as vomiting with or without blood and/or melena may indicate a stomach ulcer or cancer are present and are indications for an endoscopic exam. If a duodenal aspirate for culture or isolation of Giardia, pancreatic response testing, or biopsies are necessary, endoscopy would be indicated. Colonoscopy is useful to diagnose many large bowel diseases or generalized intestinal diseases such as inflammatory bowel disease or diffuse intestinal lymphosarcoma. Multiple biopsies of the gastrointestinal system should be taken any time endoscopy is performed as a diagnostic test. Tissue may appear grossly normal, but show pathology when examined histologically.

The ideal endoscope for gastrointestinal use in small animals must be slender enough to pass through the pylorus of small cats, long enough to reach the duodenum of giant breed dogs, have four-way tip deflection, irrigation, insufflation, suction and a biopsy channel at least 2.0 mm in diameter.

**ADVANTAGE**

The advantage of endoscopy over other methods of evaluating the digestive system is that it is nonsurgical. The technique allows for visualization of the lining of the digestive system and for taking samples of the lining of these organs, including biopsies. Many foreign bodies in the esophagus and stomach may be removed via endoscopy.

**DISADVANTAGE**

The major disadvantage with endoscopy is the necessity to anesthetize the patient.

**PREPARATION OF PATIENT**

Endoscopy should be preceded by adequate laboratory testing and radiology. The blood work is necessary in part to indicate the patient is healthy enough to withstand the anesthesia. Animals are fasted for 12 hours before an elective endoscopy is performed. General anesthesia with tracheal intubation is recommended. A mouth gag is used to prevent damage to the endoscope or the patient's teeth. In cases where the lower intestinal tract is to be examined, the patient should be fasted for 24-48 hours. Enemas are then used to clean the intestines of remaining fecal matter. Sedation or anesthesia is used to eliminate any pain and to keep the animal from moving.

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