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# TRACHEAL ASPIRATE AND BRONCHIOLAR LAVAGE

## Indications

These methods are used to collect cells from the trachea and lower airways in order to examine a pathological cellular response when investigating coughing and suspected airway disease. The material collected may also be useful for microbiological studies.
It is important to note that cells representative of interstitial disease (e.g. metastatic neoplasia, interstitial fibrosis) may not be available for collection in the lower airways and therefore could be missed. If interstitial disease is suspected, lung biopsy or guided aspiration of such lesions should be considered.
Respiratory samples of varying volume may be obtained by the two methods described.

## Endotracheal Tube Method

It is preferred in the cat and in fractious dogs. General anesthesia is required.

### Procedure

Note: Prior and after performing the sample collection the animal should be well oxygenated.

- After the induction of anaesthesia, the endotracheal tube should be passed with minimal oropharyngeal contact. With the animal in lateral recumbency, a catheter is placed through the lumen of the endotracheal tube.
- Saline (1-2 ml/5 kg body weight) is infused and immediately retrieved. If there is difficulty retrieving fluid it may help to roll the animal onto the opposite side. Up to three aliquots of saline may be instilled and repeated instillation may be necessary if the volume of fluid retrieved is low.
- Sample collection is noted as above. Mucus that may be present on the end of the endotracheal tube following extubation should be smeared on a slide and labeled as originating from the ET tube.

### Problems

Oropharyngeal contamination may affect both the cytological and the culture findings. A bacterial culture is included and may be helpful in determining if infection is likely.

If a bronchial wash needs to be repeated this should be done immediately, or after a delay of 48 hours, since the procedure results in a neutrophilic response.

## Transtracheal Wash Technique

This technique may be very useful in the dog. Sedation generally provides sufficient restraint and general anesthesia may be avoided. However, there is a small risk of infection at the site of tracheal puncture.

### Equipment

- 18 gauge jugular catheter; Benkat, Granby House, Belfield Street, Ilkeston, Derbyshire, DE7 8DU. Tel: 0115 930 9716
- Sterile isotonic saline.

Figure 1: Transtracheal Tube Method

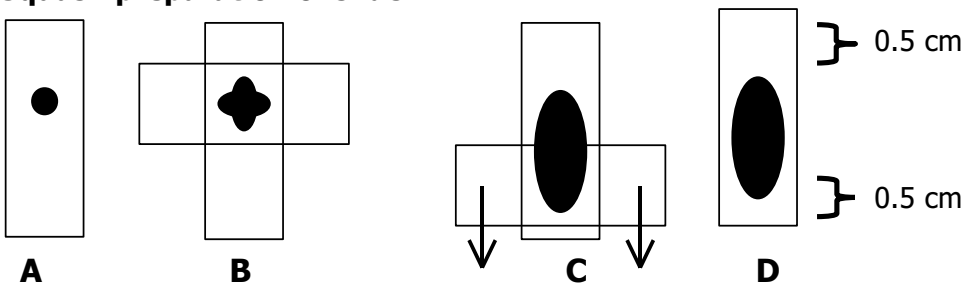
### Procedure

- The skin of the midline larynx and proximal tracheal and surrounding area is prepared as for surgery.
- The animal is restrained in the sitting position/sternal recumbency and a small amount of local anaesthetic is infiltrated into the subcutaneous tissue of the midline larynx and proximal trachea.
- Before inserting the needle, the catheter should be measured for length.
- It should be inserted to a level just proximal to the carina, which is approximately at the level of the 4-5th intercostal space in the dog.
- The cricothyroid ligament may be palpated as a depression cranial to the cricoid cartilage.
- The needle is inserted through the cricothyroid ligament into the lumen of the larynx.
- The catheter is advanced through the needle to the level of the carina. This process often induces coughing.
- Once the catheter is in position the needle is withdrawn from the tracheal lumen and sterile saline is injected into the tracheal/bronchial lumen (1-2 ml/5 kg body weight)
- When the animal starts to cough, or at the end of the injection, aspiration of the saline should begin. A very small quantity of saline is generally retrieved.
- When the catheter is removed digital pressure should be applied to the wound to prevent the development of subcutaneous emphysema.
- Samples should be immediately placed into an EDTA tube.
- Slides of mucus or a centrifuged deposit should be made immediately.

## Sample Submission

- **1-2 unstained glass slides** prepared by **squash technique** (see figure 1 below) should be submitted. The smears should be rapidly dried. The airstream from a hairdryer is suitable for this. Air (warm/cool but not hot) should be directed onto the back of the slide form a distance of 6-8 inches.
- An additional aliquot of fluid should be transferred in an **EDTA tube**.
- To preserve the cellular morphology it would be useful to include, when enough fluid has been withdrawn, a second EDTA sample promptly fixed with the addition of at least 1-2 drops of 10% buffered neutral **formal saline** (as supplied in our histopathology pots) per ml of fluid, and labelled it accordingly. This will be processed separately and stained with a modified Papanicolaou stain, which greatly improves the diagnostic yield.

**Fig 1: Squash preparation of slide**




A small amount of the sample is placed on one slide and a second slide placed on top. The second slide may be perpendicular or parallel to the first. The material will spread between the two slides (**Figure 1a**). If necessary, very gentle pressure may be used to facilitate spreading (**fig. 1b**) and the top slide is gently pulled across the bottom until the two slides are separated (**fig. 1c**). The slides should slide apart, and should not be lifted away from each other (**fig. 1d**).