Placement of a Nasoesophageal or Nasogastric Tube

The “Laci” Procedure

An ICU/VTH Policy prompted by “Laci” Shera, who died of complications of an intrabronchial feeding tube

1. There will be no nasal tube feeding until the correct positioning of the tube has been confirmed by a radiology faculty member or the on-call radiology resident.

   a. Radiology will implement a 2 view exam (oblique lateral and VD or DV) with no increase in fees relative to the current charge for a single view, provided this discounted exam is used solely for this purpose. If this 2 view exam is used for other than tube placement check, the client will be charged a full routine exam fee.

   b. During off hours, the radiology resident on call will view the film from home with no emergency fees charged, provided the request is made at a ‘reasonable hour’. Radiographs obtained during sleeping hours (10 PM – 7 AM) should be read in the morning. Those tubes will NOT be used for feeding until after that time.

   c. Confirmation of proper tube positioning, or a warning that the tube is not correctly positioned, will be provided by verbal report immediately, with a written report to follow by the next business day.

   d. A diagnosis of proper placement will require that the tube is present within the lumen of the esophagus and that the tip of the tube is located caudal to the level of the carina.

   e. In the event of ‘correct tube placement’, the radiology service will use a standardized report. The report will read: “This 2 orthogonal view exam of the thorax confirms that the tube is not in the trachea and is presumably within the esophagus with the tip located ……

   f. If the tube could potentially be in the trachea, that information will be provided on the report.

   g. Tubes may be used for aspiration of esophageal or stomach contents before radiographs are obtained, but no feeding will be allowed until that study is performed.

2. All staff will be instructed to enforce a policy that any personnel involved in tube placement will review the written guidelines (Appendix I) for tube
placement prior to performing the procedure and sign off on a checklist that remains with the patient record.

3. Animals receiving a continuous infusion of food will be maintained in the intensive care unit.

4. Standing orders for any patient with a nasal feeding tube should include interruption of feeding if any of the following conditions are observed. Because the harm caused by an interruption of feeding is negligible and the consequences of airway contamination are disastrous, that decision should be made by anyone associated with the case and should not require prior approval. ICU staff will be expected to stop feeding if there are any concerns.
   a. New onset of cough, gagging, or retching.
   b. Development of course crackles at auscultation
   c. Resting respiratory rate increase of 6 BPM
   d. Behavioral change suggesting anxiety

See next page for details on the procedure
Detailed Instructions

Nasoesophageal and nasogastric tubes are used to evacuate the esophagus or stomach or to provide enteral nutritional support. Although it is always important to insure proper placement of these tubes, it is especially critical when feeding a liquid diet through the tube as **a misplaced tube will result in patient death!** Many, perhaps most, sick animals will allow you to pass a tube into its airway without a cough or struggle, so it is imperative to use the techniques outlined here to increase the likelihood of success and to confirm correct placement with radiographs that are reviewed by a radiologist.

Materials needed:

Proper size tube:
- Cats, dogs < 10 kg: 5 – 8 French catheter at least 12” long
- Medium size dogs: 8 – 12 French PVC feeding tube
- Medium –to-large dogs: 10 – 18 French single or double lumen tube

Appropriate size syringe (matched to the tubing adapter)
- Tubing extension set if indicated
- Cap for the tubing (Luer injection cap +/- a flared tubing adapter)
- 2-0 monofilament nylon suture
- 1” waterproof white tape
- .2 - .5 ml 2% lidocaine in a syringe
- 2% lidocaine lubricant

Procedure:

1. If using a tube 12 French or smaller, mark the proper depth (see below) and place the tube in a freezer for a few minutes while prepping the patient and organizing the rest of the materials. This will stiffen the tube and make it less likely to coil or kink during insertion.
2. Determine the desired nostril, tip the patient’s nose just above horizontal, and instill enough injectable lidocaine to induce a swallow.
3. Pack a few drops of 2% lidocaine lubricant into the same nostril.
4. If the tube is to be used for esophageal decompression, create additional fenestrations as necessary (consult an ICU clinician for guidance on the proper technique).
5. Measure the length of tubing that will need to be inserted depending on function:
   a. Nasogastric sump: Measure to 1” (cats) - 6” (large dogs) beyond the 13th rib.
b. Nasoesophageal feeding: Measure to the 10th – 13th rib.
c. Nasoesophageal decompression: Measure to the 10th – 13th rib or less depending on the extent of involvement with megaesophagus.

6. Mark the proper depth site on the tube with an indelible ink marker.
7. Lubricate the tube with 2% lidocaine lubricant.
8. Grasp the catheter 2 cm from the tip and gently advance the catheter tip into the nostril. Cats are easy: most attempts at passing a nasal tube will result in the tube being placed appropriately in the ventral nasal meatus, and the tube usually passes to the nasopharynx without difficulty. The trick in dogs is to direct the catheter into the ventral nasal meatus, below the middle turbinate. To accomplish this, advance the catheter until the tip passes by the folds at the nasal orifice (generally 0.5 - 1.5 cm into the nostril), then direct the catheter in a markedly ventral and slightly medial orientation. The catheter should point to the first incisor tooth on the ipsilateral side. Pushing the nose up (to make a “Pug nose” appearance) is often critical to success in dogs.
9. Indent the soft tissue of the nasal planum in front of the nasal bone at the same time you push the nostrils upwards. Surprisingly, most animals tolerate this procedure extremely well, as long as you do not restrain them. The trick is to keep your hands in contact with the animal’s muzzle, and “ride” with their movements.
10. If the catheter is correctly placed in the ventral meatus, it will pass with slight resistance and a "grating" feel as it passes under the middle turbinate. If the catheter is in the dorsal meatus, it will pass with little or no resistance until it reaches the level of the medial canthus of the eye, where it will run into the ethmoid turbinate. IF THE CATHETER MEETS WITH FIRM RESISTANCE, YOU HAVE UNDOUBTEDLY PLACED IT IN THE DORSAL MEATUS. REMOVE IT AND TRY AGAIN. FORCING IT IN ANY MORE WILL PRODUCE SIGNIFICANT HEMORRHAGE FROM THE ETHMOID TURBINATE. Once in a while you will not be able to enter the ventral meatus even after 2 excellent attempts. In that case, anesthetize the opposite nostril and try that side. There is usually enough asymmetry between sides that you'll often get it into the other side on your first attempt. Correct location is noted on this sagittal section:

11. Pass the tubing to the level of the vertical ramus of the mandible, then tip the patient's nose ventrally to facilitate passage of the tube up and over the epiglottis.

12. Induce swallowing by 'tickling' the epiglottis with the tip of the tube, and be prepared to rapidly thrust the catheter in 1-2” during a swallow. If you can not induce a swallow with the tube, try syringing a few ml's of water into the mouth to encourage swallowing. The patient swallow will help guide the tube into the esophagus.

13. Pass the tubing a sufficiently distance to ensure that all of the fenestrations are just within the cervical esophagus. For a feeding tube with no additional fenestrations, that usually means no more than 2” (cats)-6” (large dogs) beyond the vertical ramus of the mandible.

14. **STOP** at that depth and apply suction with the syringe. If the fenestrations are located within the esophagus there should be little or no air/fluid removed before achieving a vacuum. If you continually aspirate air, the tube is likely to be in the trachea.

15. If a vacuum is achieved, continue to advance the tube.

16. Open the patient's mouth and make sure there are no signs the tube has coiled back into the pharynx.

17. If your intention is to position the tube within the esophagus, attempt to pass it further into the stomach and aspirate stomach contents as another way to confirm placement within the GI tract and to help rule out the possibility that the tube has folded back on itself. Once you obtain a positive aspirate, either return the fluid or evacuate the stomach (if indicated) and reposition the tube to its marked depth.
18. If the attempt to aspirate stomach contents is negative attempt a test injection of air while auscultating with a stethoscope behind the 13th rib on the left.
   - A difficult injection indicates that the tube has folded back on itself and is kinked.
   - If there is a LOUD gurgling heard, the tube is likely within the stomach.
   - A fainter gurgle usually means the tube is in the esophagus. In that case, repeat the maneuver while watching and auscultating the cervical esophagus.
   - If the tube terminates in the esophagus, an injection of air will produce an audible burp with distension of the cervical esophagus distal to the partial occlusion produced by your stethoscope.

19. Once a proper depth is identified, apply a ‘butterfly’ of the waterproof white tape at that same site. Curl the exterior portion of the tubing as tightly back on the patient’s nose as possible without kinking the tube. For 16 French and larger tubes this will require that you create a relatively large loop of exposed tubing that will need to be stabilized in a ‘sandwich’ of waterproof tape. The tubing will need to be anchored either between the eyes or to a cheek, depending on tube size and patient anatomy. Do NOT let the tube rest in the animal’s field of vision! See the instructions for “Nasal Oxygen Protocol” for options on suturing.

20. If feeding is planned, aspirate one last time to confirm that a vacuum is achieved, then obtain two views of thoracic radiographs. Hospital policy requires that a radiology faculty or resident approves positioning of the tube.
   a. If the tube is in an airway remove it immediately.
   b. If the tube is folded back on itself, remove and replace (if the patient tolerated passage through the nose well) or partially withdraw and replace if the patient is distressed by tube passage through the nasal cavity.
   c. Thoracic radiographs MUST be repeated once the tube is replaced, and a radiologist must confirm proper placement prior to using the tube for feeding.

21. Just before feeding, inject 3 – 20 ml of water to confirm an absence of gagging or coughing. For patients that are fed intermittently, do this every time you feed.

22. If the patient shows any of the following, discontinue feeding until the case is reviewed with senior faculty and the clinician responsible for that patient.
   a. New onset of cough, gagging, or retching
   b. Development of course crackles
   c. Resting respiratory rate increase of 6 BPM
   d. Behavioral change suggesting anxiety
CHECKLIST FOR FEEDING TUBE PLACEMENT

☐ Tube insertion depth marked with pen or tape.

☐ Nose tipped down when tube reaches the level of the vertical ramus of the mandible.

☐ Induced swallow during passage into the esophagus

☐ Vacuum achieved with tube not advanced past the cervical esophagus.

☐ Inspect Pharynx to insure the tube is not coiled there.

☐ If possible, pass the tube into the stomach and confirm that location by aspirating stomach contents.

☐ Withdraw tube to desired depth and secure it.

☐ Obtain 2 radiographic views and consult with the on-call radiologist

☐ Final test aspiration and injection of water before initiating feeding.

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Signature

__________________________________
Printed name

__________________________________
Date/time