

Feline Feeding Tubes Save Lives
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Managing the anorexic cat involves both identification of the underlying disease process and provision of nutrition and other supportive care.

- Hydration, electrolyte status, pain, body temperature, vitamin B (cobalamin) status, and nausea should be evaluated, and appropriate interventions undertaken.
- Some cats can be coaxed to eat with simple interventions, such as warming the food and hand feeding. However, other patients will need assisted feeding to improve nutritional status.
- Typically, it is recommended to begin assisted feeding within 3 to 5 days of the end of voluntary food intake, but some seriously ill cats will require earlier intervention.
- Enteral feeding is preferred whenever possible as it maintains gastrointestinal health, and is safe, convenient, and cost-effective. If the gut works, use it! Early institution of tube feeding has a better outcome than waiting until the patient has end stage disease or is debilitated.

Nasoesophageal/Nasogastric Tubes

- Nasoesophageal (NE) or nasogastric (NG) tubes are easy to place and safe.
- They are typically used for short-term nutritional support (no more than 2-3 days)
- Only liquid diets can be fed using NE or NG tubes.
- **Contraindications** to placement of NE tubes include the inability to swallow or lack of gag reflex.
- **Complications** may include rhinitis, esophageal reflux, aspiration, inadvertent tube removal, or obstruction of the tube.

NE/NG Tube Preparation and Procedure

- Sedation is only required for fearful patients that cannot be restrained well.
- Place 0.5-1.0 mL 0.5% proparacaine hydrochloride into one of the nasal cavities and tilt the head upward to encourage the local anesthetic to coat the nasal mucosa.
- Measure the length of the tube along the side of the cat from the tip of the nose to the last rib. Measuring to the last rib will place the tip of the tube into the stomach. Mark the proximal end of the tube with tape or permanent marker.
- Lubricate the tube with 5% lidocaine jelly and keep the cat's head in a normal position. Insert the tube caudoventrally and medially into the nasal cavity. The tube should pass into the oropharynx and stimulate a swallow reflex; then advance the tube to the predetermined mark.
- Inject 3-5 mL sterile saline into the tube to confirm placement. If the cat coughs, remove the tube and place again. Ideally, placement is confirmed with a lateral thoracic radiograph. Secure the tube to the lateral aspect of the nose and also at the zygomatic arch or forehead with sutures and butterfly tape or surgical adhesive. An Elizabethan collar may be placed to prevent tube removal.
- Fill the tube with water and cap it when not in use to prevent intake of air, reflux of stomach or esophageal contents, or occlusion of the tube with food.

Esophagostomy Tubes

- Any patient with a catabolic illness or malabsorptive disease (e.g., neoplasia, chronic intestinal or pancreatic disease, moderate to severe renal disease, protein-losing enteropathy, hepatic lipidosis) that is at risk of malnutrition will benefit from having a large bore esophagostomy feeding tube (e-tube) in place to provide complete and balanced nutrition.
- Also, cats that have been partially or totally anorexic for 3 or more days (eating less than 85% of resting energy requirement), and those that have lost over 10% of body weight (not due to dehydration) will benefit from an e-tube.
- E-tubes are also used for cats with conditions that mechanically interfere with prehension of food or swallowing (e.g., oral or pharyngeal problems).

Advantages of E-Tubes:

- Tubes are well tolerated by cats, and they can eat with the tube in place.
- Diets that are nutritionally complete and balanced (e.g., blenderized therapeutic foods) may be administered through large bore tubes.
- Use and care of tubes is easy and readily learned by cat owners.
- E-tubes may be left in place as short or as long as is warranted by the patient's condition.
- Removal is easy and does not require sedation or anesthesia.
- No special equipment is required.
- Unlike NE/NG tubes, e-tubes are not in the cat's range of vision and are better tolerated. They can also be maintained for a longer period.
- No long-term complications (such as esophageal stricture or diverticulum, esophagitis, or subcutaneous cervical cellulitis) have been reported.

Potential Complications of E-Tubes:

- A brief period of anesthesia is required.
- The patient may remove the tube before it is warranted. However, it is readily replaced without further sedation once a stoma has formed. Local anesthesia will be required to replace the purse-string suture and finger trap tie.
- Occasionally, a patient may vomit the tube. If it is bitten off and swallowed, it will need to be retrieved. If not bitten off, it can readily be removed and replaced, as above.
- E-tubes are **contraindicated** in patients lacking esophageal motility (e.g., megaesophagus), in those with pre-existing esophageal inflammation, in patients with persistent vomiting, and in any patient with a risk of aspiration.

Patient Preparation for an E-Tube

- Anesthetize and place an endotracheal tube.
- With the patient in right lateral recumbency, shave the mid cervical region of the left side of the neck from the angle of the mandible to the thoracic inlet.
- Surgically prepare the shaved area, noting the location of the jugular vein so it can be avoided during tube placement.
- Measure and mark the tube so that when it is in place, the tip of the tube will lie at the level of the 7th-9th rib (the distal esophagus).

Retrograde Placement with the MILA Tunneler and E-Tube

- The hub and skirt are removed from the 14Fr E-tube by unscrewing the skirt and pulling the Y-adaptor and skirt off. These pieces will be re-installed at the end of the procedure. Trim 3-4 cm from the end of the E-tube where it was stretched by the adaptor so that the E-tube will fit securely on the end of the tunneler.
- Measure and mark the E-tube for the desired length.
- Insert the E-tube into the esophagus and advance until the tip is in the distal esophagus.
- The rounded end of the 14Fr tunneler is inserted into the esophagus alongside the E-tube to the pre-determined location for the stoma.
- The tip of the tunneler is pressed against the esophagus and the neck; use a scalpel blade to create a stab incision large enough to push the tip of the tunneler through. You can grasp the tip of the tunneler with forceps to stabilize it.
- Connect the proximal end of the E-tube to the other end (dark end) of the tunneler. Pull the tunneler and the E-tube through the stoma; remove the tunneler.
- Position the E-tube according to the mark on the tube and secure with a purse-string suture; leaving long ends on the suture to continue with a finger-trip.
- Take a lateral thoracic radiograph to confirm placement. Bandage with a Kitty Kollar.

E-Tube Care and Removal

- The owner should be instructed to remove the Kitty Kollar daily to inspect the site and gently clean the stoma with dilute chlorhexidine. An antibiotic cream can be used if minor stoma site infection occurs.
- When the tube is no longer needed, simply cut the purse string suture and pull the tube out. Suturing the opening is not required; it will contract and epithelialize over 2-3 days.

How and What to Feed

- Calculate the number of calories needed per day and convert this to mL of diet required/day. The diet should be one that can be fed through a syringe.
 - For adult cats, the starting point for daily resting energy requirement (RER) is calculated by the equation $[30 \times \text{body weight in kg} + 70]$.
 - For kittens/cats under 2 kg (4.4 lb), it is more accurate to use the equation $[70 \times \text{BW (kg)}^{0.75}]$ to calculate RER.
 - The amount fed should then be adjusted according to monitoring of body weight and body condition score.
- Feeding can begin as soon as the patient has recovered from anesthesia but remember that the stomach capacity may be reduced, and gastric tone and emptying may be slow due to anorexia.
 - The maximum amount per feeding should not exceed 20-30 mL/kg (about 50% of stomach capacity) to avoid over-distension and vomiting.
 - The amount fed should be introduced gradually, taking 2-3 days to reach the expected daily intake. The daily requirement should be divided into 5-6 feedings.
 - Before and after each feeding, the tube should be flushed with 5-10 mL of lukewarm water.
- Once the cat is voluntarily eating about 60% of its daily requirements, tube feeding can be gradually decreased. The tube should not be removed until the cat is consistently maintaining adequate nutritional intake on its own.

Trickle Feeding

- Divide the daily volume in half for a twelve-hour period.
- Place this 12-hour quantity into a new or used empty fluid bag via a 16G needle on a large syringe (e.g., 20 mL syringe).
- Connect an IV line and fill it with the food either by gravity drip or as a calculated volume through a syringe pump at a set rate.
 - If the food is stiff and difficult to syringe, warm the calculated volume in a bowl gently in the microwave until the fat softens adequately.
- Discard the IV bag after 12 hours and start the next feeding period with a new fluid bag and IV line to prevent bacterial contamination.
- Food should always be fed at body temperature.

Dissolving Clogs in Feeding Tubes

- All types of feeding tubes may become clogged with food. Flushing the tube well with warm water before administration of food and again afterward can help prevent clogs.
- Various solutions have been recommended to dissolve food clogs, including plain water, carbonated beverages, cranberry juice, meat tenderizers in water, etc.
- In one study, the solution that performed the best was ¼ tsp pancreatic enzyme powder and 325 mg sodium bicarbonate dissolved in 5 mL water. The next most effective solution was plain water.

Resources

MILA: <https://www.milainternational.com/>

- Nasogastric plus feeding tube 6Fr, 55 cm: item NGP522S
- 14Fr tunneler for esophagostomy feeding tube: item ETUN14
- Esophagostomy tube, 14Fr adjustable length: E1430

Videos

- Placing a nasoesophageal feeding tube in cats (Dr. Susan Little): <https://youtu.be/AfFAm0jhafY>
- Placing an esophageal feeding tube in cats, traditional technique (Dr. Susan Little): <https://youtu.be/ekuF2BCNyt4>
- Retrograde esophagostomy tube placement (MILA): <https://youtu.be/qF14Jfajkhw>