Feeding tubes are generally tolerated well by most patients and most feeding tubes are relatively easy to place. There are two types of feeding tubes that may be placed by technicians – Nasogastric (NG) and Nasoesophageal (NE) tubes. Nasogastric (NG) tubes are inserted into the nostril, through the nasal cavity into the esophagus, terminating in the stomach. Nasoesophageal (NE) tubes are inserted into the nostril through the nasal cavity terminating in the distal esophagus.

Nasogastric (NG) and nasoesophageal (NE) tubes are useful for patients who are unwilling to or are unable to eat but have normal GI function. Placement does not require anesthesia and usually can be done without sedation by using a topical anesthetic. They are used short-term, usually less than 14 days, and are sometimes used until the patient is stable enough to be anesthetized for a longer term feeding tube placement if necessary. NE/NG tubes are contraindicated in patients that are actively vomiting, comatose, do not have a gag reflex, or have nasal tumor / nasal disease. Since these tubes are generally quite small (usually 8 French or smaller) patients may be fed only liquid food. Complications associated with NE/NG tubes include epistaxis caused by nasal mucosa irritation; aspiration pneumonia should the tube become dislodged due to vomiting or regurgitation; and esophageal stricture (a condition which is rare).

Nasogastric (NG) and Nasoesophageal (NE) Tube Placement:

Materials needed for placement include:

- Tetracaine or proparacaine
- Sterile lubricant jelly
- Appropriate sized tube
- 2.0 or 3-0 nylon suture material
- Scissors
- 22-gauge needle
- Permanent marker
- Empty 6cc syringe
- 6cc syringe of sterile water
- E-collar

To insert the NG or NE tube:

1. Elevate the patients muzzle and apply a few drops of a topical anesthetic, such as Proparacaine Hydrochloride Ophthalmic Solution USO, 0.5% into the nostril you have selected for tube placement. Allow 5 minutes before attempting to insert tube.
2. While you are waiting, place a stay suture as close to the nose as possible.
3. An easy way to place a stay suture is to quickly insert a 22-gauge needle through the skin at the point where the wing of the nostril meets the fur. With the needle in place insert a 2.0 or 3.0 nylon suture through the needle from the beveled tip and out the hub of the needle. While holding the suture remove the needle. Tie a square knot closely to the skin but loosely enough to allow passing another suture under it.
4. Measure and mark the tube.
5. The NE tube measures to the 7th or 8th intercostal space. The tip of the tube will fall in the distal esophagus.
6. The NG tube measures to the last rib. The tip of the tube will fall either slightly before or in the stomach.
7. Apply sterile lube to the tube.
8. Holding the patient’s muzzle with your non-dominant hand begin inserting the tube with your other hand. Press the patient’s nose upward using the thumb of the hand that is holding the muzzle.
9. Once you have inserted the tube about the length of the patient’s muzzle, lower the patient’s head pointing its nose downward slightly. These motions should help guide the tube into the esophagus rather than the trachea.
10. Continue to advance the tube until you have reached the mark you made when measuring the tube prior to placement. The patient may or may not swallow during placement. Gently stroking the throat may encourage swallowing which may assist the feeding tube to more easily pass down the esophagus.
11. If the patient begins to cough at any time during placement, STOP, remove tube and try again.
   Lack of coughing DOES NOT ensure the tube is not in the trachea!
12. Attach a 6 ml syringe to the tube and check for negative pressure.
13. If negative pressure exists, flush 5 – 6 ml of sterile water into tube. If the patient coughs the tube is in the trachea. If the patient does not cough placement MAY be correct; confirmation with a radiograph is recommended.
14. Cap the tube with an injection cap and temporarily suture the tube to the stay suture leaving long tails to secure the tube in place once proper placement is confirmed.
15. Confirm placement with a single left or right lateral post-procedural radiograph.
16. Once proper placement is confirmed, secure tube with Chinese finger trap.
   The Chinese finger-trap suture is perfect for feeding tubes; it continues to tighten if the tube is tugged. Pass a long piece of suture through the previously placed stay suture and secure with a square knot. Then begin the Chinese Finger trap pattern. The suture is wrapped around the tube, crisscrossed and tied into a square knot. Repeat a minimum of 5 crosses. For red rubber tubes each throw should be pulled tight enough to make a small indentation in the tube. For silicone tubes pull tightly however indenting these tubes may cause them to become occluded.
17. Secure the other end of the tube in a second location either on the cheek (the facial nerves run across this area of the cheek so the suture should go through the skin but be kept as superficial as possible) or on the top of the head. Tie a loose square knot near the skin then secure the tube with a second square knot.
18. This may also be done with the 22-gauge needle method described above. Smaller diameter tubes may also be attached in this second location with surgical staples.
19. The patient may require an E-collar to prevent tube removal.

**Beginning Assisted Feedings**

Before beginning assisted feeding, it is important to determine the patient's Resting Energy Requirement (RER). RER represents the energy requirement for a normal animal, which is not fasted, at rest under thermoneutral conditions.

There are several formulas for calculating this. The author recommends using one of the following calculations, but use the one you are most comfortable with.

- \[ \text{RER} = 70 \times (\text{body weight in kg})^{0.75} \]

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  Ed Carlson, CVT, VTS (Nutrition)
• $\sqrt[3]{x} \cdot (\text{wt in kg} \times \text{wt in kg} \times \text{wt in kg}) = x \times 70 = \text{RER}$

The formula below may also be used for patients weighting more the 2kg and less than 45kg. However, this formula should not be used for patients smaller or larger than these guidelines or for critical patients.

• $\text{RER} = 30 \times (\text{body weight in kg}) + 70$

The general recommendation is to begin feeding $\frac{1}{4}$ of the patients total RER for the first 12 hours and, if well tolerated, to increase by $\frac{1}{4}$ the total RER every 12 hours until full RER is reached. If at any time the patient vomits, discontinue feedings until vomiting has resolved, reduce volume by $\frac{1}{4}$ when feeding is resumed, and increase volume more slowly.

**Nasogastric (NG) and Nasoesophageal (NE) Tube feedings:**

Only liquid veterinary diets should be used for feeding through NG and NE tubes. CliniCare® Canine/Feline Liquid Diet, which contains 1 Kcal/ml, is a good option. Emeraid® Intensive Care HDN™ Feline and Emeraid® Intensive Care™ HDN Canine are powdered formulas which are mixed with water and are also a good option. The volume of water added can be varied dependent on the diameter of the feeding tube, however the caloric density is reduced as the volume of water is increased. Trickle feeding via constant rate infusion (CRI) is most often used for hospitalized patients, although these tubes may also be used for bolus feedings and to administer oral liquid medications. Tablets should not be crushed and administered via these small tubes.

A number of liquid diets designed for people are also available. These diets are typically less expensive than veterinary liquid diets however are nutritionally inadequate and some may contain ingredients that are inappropriate for dogs and cats. These human diets are especially inappropriate for cats as they are too low in protein, taurine, and arginine.

**Troubleshooting Feeding Tubes**

Flushing the tube well with water after each bolus feeding, or every 4 hours for CRI 's, will usually prevent the tube from becoming clogged with food.

Some patients may be irritated by the feeding tube and require a buster collar to prevent them from removing the tube. Some patients with NE or NG tubes may experience excessive sneezing. If this happens, apply a topical anesthetic; gently lift the patients muzzle upward and apply 2 or 3 drops into the nostril the tube is placed in.

If the tube becomes dislodged, which usually causes coughing and/or discomfort and distress:

- If via CRI, STOP IMMEDIATELY!
- If flushing causes coughing – DO NOT FEED! Alert the doctor. The tube may need to be removed or replaced.

**Discontinuing Assisted Feedings**

When the patient is voluntarily eating 60% of its RER, assisted feedings should gradually be reduced and discontinued when voluntary consumption has reached the patients full RER. Long-term feeding tubes (E & PEG) should not be removed until the patient has been eating its full RER consistently and maintaining its body weight for a minimum of one week or more.

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