

Placing Feeding Tubes in Dogs and Cats

References:

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- Marks SL. Chapter 71, "Enteral and Parenteral Nutritional Support," in Stephen J Ettinger and Edward C. Feldman *Textbook of Veterinary Internal Medicine, 5th Edition*.
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Enteral feeding is for patients that can not or will not ingest adequate nutrition, but have adequate GI function for digestion and absorption of food delivered by tube.

I. Nasoesophageal Tube

A. Ideal for feeding for 3-7 days.

1. Advantages:
 - a. Sedation is usually not necessary, unless patient is fractious (placement is easier with swallowing reflex intact).
 - b. Can usually be placed quickly without anesthesia.
 - c. No risk of adverse effects if properly placed.
 - d. No adverse effect if removed by patient (will usually pass the tube if swallowed).
2. Disadvantages
 - a. Not suitable for long term feeding, as they are easily dislodged.
 - b. Must feed a very liquid diet, as tube sizes must be small (blenderized diets clog small tubes).
 - c. May not be able to use NE tube if significant pathology to the nasal passages or head.

B. Tubes used for nasoesophageal feeding:

1. Red rubber, polyurethane or silicone tubes, with or without weighted tip.
2. Polypropylene don't work well—they kink.
3. 3.5 French or 5 French red rubbers work well for cats.
4. 5 French or 8 French infant feeding tubes work well for dogs.

C. Supplies for nasoesophageal tube placement:

1. Topical anesthetic.
2. Lubrication jelly.
3. Feeding tube.
4. Scissors to cut tube.
5. White tape.
6. Suture or tissue glue.
7. Elizabethan collar.

D. Placement instructions for nasoesophageal tube :

1. Tilt the nose upward and place 4-5 drops ophthalmic anesthetic (proparacaine) or lidocaine in each naris, and wait for a few minutes for it to take effect. Repeat.
2. Measure tube:
 - a. Starting with the feeding end of the tube, measure from anchor on dorsal midline to the external nares – mark with a white tape butterfly here.

- b. From tip of the nose to just caudal to the heart base (7th-8th intercostal space) – trim distal end if needed.
 - c. You do not want the tube to extend into the stomach, as a tube passing through the gastroesophageal sphincter can cause gastroesophageal reflux and ulceration.
3. Lubricate end of tube with sterile water soluble lube or 2-5% lidocaine jelly.
4. Hold the patient's nose firmly in a normal position (avoid flexion or extension). Direct the tip of the tube medially and ventrally into one of the external nares, until it passes into the ventral meatus of the nasal passage.
5. Lift the nasal planum dorsally and lift the proximal end of the tube, if you are having trouble getting into the ventral meatus (see figure 1 right).
6. Slow passing the tube as your reach the oropharynx, to allow the dog or cat to swallow the tube into the esophagus.
7. Insert the tube until you reach the white tape butterfly which was used to mark the place the tube will exit the external nares (see figure 2 right).
8. Test the tube by injecting 10-15 ml of sterile water or sterile saline. If there is a coughing reflex, remove and reinsert the tube. If you wish, take a lateral cervical radiograph to confirm proper positioning of the tube.
9. Secure the tube at the tape butterfly to the nasal planum just lateral to the external naris, using tissue glue or sutures. Secure the tube with sutures or tissue glue at the dorsal bridge of the nose, and on one or two spots on the dorsal midline of the head (brachycephalic dogs may need fewer anchor spots). Use white tape butterflies at these anchor sites if necessary. On dogs with long hair, it may be necessary to trim hair to secure the tube to the skin at these additional spots. Do not allow the tube to contact the whiskers on cats.
10. An Elizabethan collar is used in most animals with NE tubes to prevent removal. The feeding end of the tube is threaded caudally through the collar (see figure 3 right). Attaching the end of the tube to the collar can help to secure it.
11. NE tubes are easily removed by cutting the sutures to the tape butterfly, and removing the tube.

Figure 1

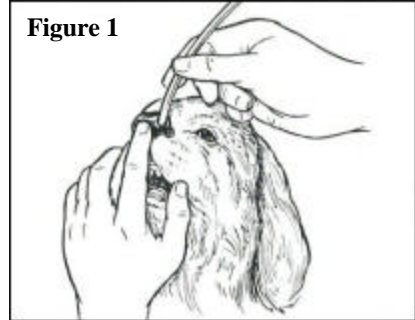


Figure 2

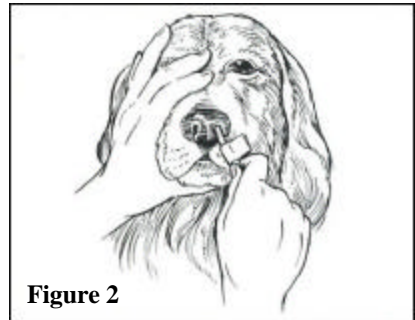
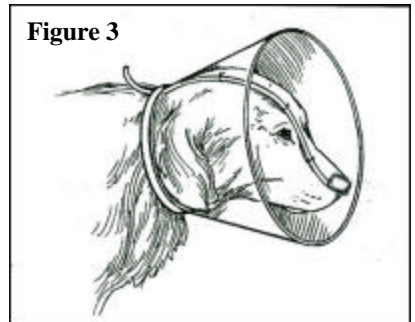


Figure 3



E. Contraindications to placement of nasoesophageal tube

1. Thrombocytopenia – these dogs are prone to epistaxis with nasal intubation (can be severe).
2. Respiratory compromise.
3. lack of gag reflex (neurologic disease or unconscious)

II. Pharyngostomy tube – I don't like them because:

- A. Many patients gag on them.
- B. They can cause airway obstruction, aspiration of food, epiglottic entrapment.
- C. Damage to the recurrent laryngeal nerve can occur during placement

III. Esophagostomy tube

A. Ideal for long term feeding when vomiting can be managed.

1. advantages :
 - a. Can be placed very quickly (10-15 minutes).
 - b. Very low risk of adverse effect if properly placed. Esophageal strictures are exceedingly rare.
 - c. No adverse effect if removed by the patient (swallowed pieces of tube are usually passed).
 - d. Can be left in place for weeks to months.
 - e. Large enough for blenderized diets.
 - f. By far the least annoying tube for the patient.
2. disadvantages :
 - a. Requires short general anesthesia.
 - b. Can be removed if not secured well.
 - c. Can cause peri-stoma irritation if not bandaged properly, and not re-bandaged regularly.
 - d. Can be vomited up and chewed off.

B. Tubes used for esophagostomy:

1. 10F-16F red rubber or silicone tubes. Cats will usually take a 12F-14F with no problem.
2. Silicone is much preferred for long term feeding – red rubber catheters become brittle and crack over weeks to months.
3. Those with attached lids are nice. Syringe plungers and injection ports make good substitutes for lost plugs.

C. Supplies for esophagostomy tube placement:

1. Drugs/equipment for short general anesthesia.
2. Clippers and surgical scrub materials.
3. Sterile surgical gloves.
4. Right angle forceps (sterile).
5. Surgical blade (sterile).
6. Esophagostomy tube (sterile).
7. Hemostats.
8. Rigid pediatric colonoscope if you have one (not necessary).
9. stylet which slides easily in and out of the e-tube (polypropylene catheter or orthopedic wire bent over at one end), which protrudes about 1 cm beyond the end of the tube when fully inserted.
10. Lubrication gel.
11. Porous white tape.
12. Non-absorbable suture material.
13. 4x4 gauze.
14. Antibiotic or povidone iodine ointment.
15. Vetrap or Coflex bandage (some people like elastikon).
16. Male injection plug adapter if tube does not have its own cap.

D. Placement instructions for esophagostomy tube:

--(see also ELD device for gastrostomy placement – can be used for esophagostomy tube placement in a similar manner).

1. Patient should be fasted for 12 hours prior to esophagostomy tube placement.
2. Anesthetize patient – I prefer my patient intubated and on gas anesthesia, but others are happy with a short acting injectable anesthesia.
3. Place patient in right lateral recumbency.
4. Measure the tube and trim if necessary.
 - a. Place the feeding end of the tube where you would like it to be anchored (opening over the left dorsal neck and facing caudally).
 - b. Direct the tube cranially, then in a 180 degree turn ventrally and then caudally at the esophagostomy site.
 - c. Continue caudally, and trim the distal end of the tube just caudal to the base of the heart, at the 7th or 8th intercostal space.
 - d. If the catheter is “closed end”, trim the distal tip off, even if the tube is the proper length. Closed end feeding tubes tend to get clogged.
5. Esophagostomy site is in the left jugular furrow, midway between the angle of the mandible and the thoracic inlet. Clip and surgically prepare the skin 2-3 inches square around the esophagostomy site.
6. Don sterile gloves and place sterile instruments on sterile field (I use the glove packaging for my sterile field).
7. Place the right angle forceps with tip up gently into the esophagus (gentle retraction on the tongue by an assistant can help move slowly past the larynx), until you can see the tip pressing upward on the skin at the esophagostomy site (see figure 4 above right).
8. Position the tip of the right angle forceps either dorsal or ventral to the jugular vein, so that your stab incision will not traumatize the left jugular vein.
9. With the left hand put gentle pressure on the hemostat handle, so that the tip is pushing firmly upward on the skin over the esophagus.
10. With the right hand, palpate the tip of the right angle forceps to confirm that there is nothing entrapped between esophagus and skin.
11. Make a small stab incision over the tip of the right angle forceps, just big enough to barely see the tip of the forceps (see figure 4 above right).
12. Bluntly force the tip of the forceps through the stab incision.
13. Open the forceps, grasp the distal end of the esophagostomy tube, and lock the forceps closed (see figure 5 above right).
14. Pull the tube and forceps cranially (see figure 5 above right), until the feeding end of the tube is snug against the skin. Detach the right angle forceps.
15. Use straight or slightly curve hemostats to grasp the distal end of the tube and feed it aborally into the esophagus, toward the stomach.
16. Use the hemostat to thread the entire tube into the esophagus (see figure 6 right). When it is properly placed, the feeding end of the tube will “flip” from caudal to cranial (see figure 7 right). Sometimes pulling the feeding end of the tube 1-2

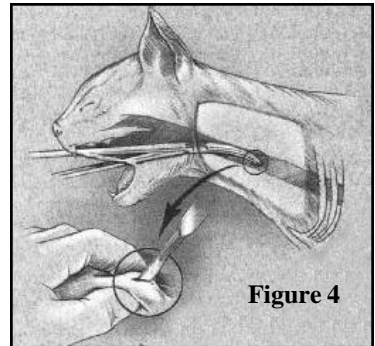


Figure 4

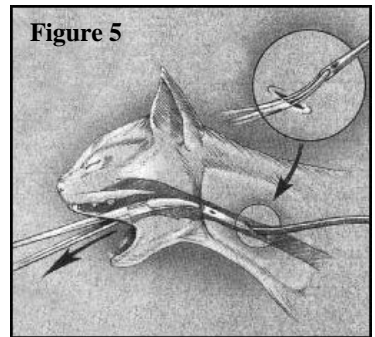


Figure 5

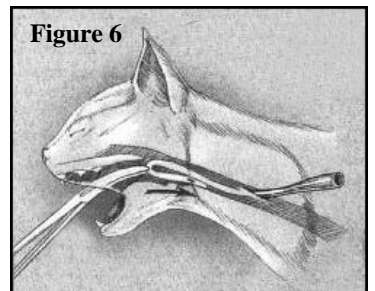


Figure 6

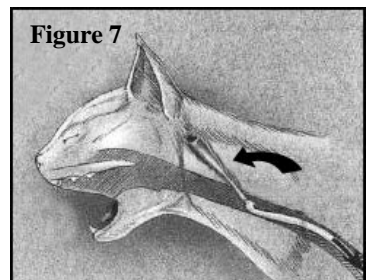


Figure 7

- inches in the cranial direction will help achieve the “flip.”
17. Confirm that the tube is properly placed without stricture at the stoma site and without any kinks either with the rigid pediatric colonoscope, or by passing the stylet fully into the tube. If you use a stylet, MAKE SURE to bend over the end, to protect both the tube and the tissues from being punctured by the stylet. Take a radiograph if you wish, to confirm proper placement.
 18. Place the feeding end of the tube where you would like it to be anchored, and then place a double-tagged white tape butterfly on the tube ¼ inch or so from the esophagostomy. The tube should slide in and out of the esophagostomy without too much resistance. If the esophagostomy is too snug, enlarge by a small amount very carefully with the surgical blade. Be careful not to nick the tube.
 19. Suture the white tape butterfly dorsally and ventrally to the esophagostomy site.
 20. Allow the patient to recover to sternal recumbency prior to bandaging the tube in place. It is difficult to gauge the proper bandage tension when the muscles are relaxed under general anesthesia. Esophagostomy tube bandages placed under anesthesia are often too snug.
 21. There are many bandaging techniques that can be used. I like to:
 - a. Cut a small piece of 4x4 gauze, apply antimicrobial ointment to it, and place it on the esophagostomy site.
 - b. Protect the shaved skin with 4x4 gauze.
 - c. Anchor the tube firmly in place with porous white tape. Some like elastikon, but I find it very difficult to remove without a great deal of discomfort to the patient. Leave no loops of tube that could be caught by a toenail to pull the tube out.
 - d. Wrap with cast padding then Vetrap or Coflex.
 22. Once the patient has recovered swallowing reflex, check patency of tube with 10 cc of water or saline. If resistance to flow, re-wrap the bandage.

E. Contraindications to esophagostomy tube:

1. Animals with profuse vomiting probably will not keep e-tubes in place.
2. primary or secondary esophageal dysfunction
 - a. esophageal stricture
 - b. post-op esophageal surgery
 - c. esophagitis
 - d. megaesophagus

IV. Gastrostomy tube

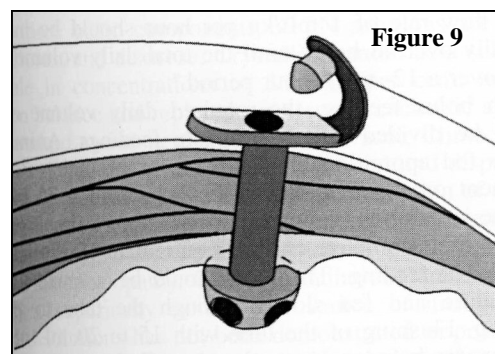
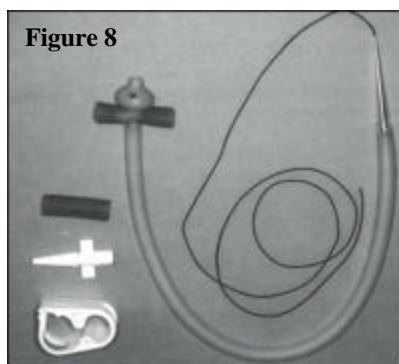
A. Ideal when the esophagus needs to be bypassed, or an e-tube can not be maintained.

1. Advantages
 - a. Tube stays in securely in place with vomiting
 - b. Largest tubes can be used here, for ease of feeding.
 - c. Latex tubes can be used for weeks to months.
 - d. Low profile tubes can be used permanently (for many years).
2. Disadvantages
 - a. Placement requires general anesthesia.
 - b. Must be maintained in place for at least 10-14 days before it can be safely removed. May take longer to form adhesion if immunosuppressive drugs.
 - c. If removed prematurely, gastric perforation can result.
 - d. 10-20% displacement, even when placed properly, which can result in peritonitis and possibly death.
 - e. Adverse effects during percutaneous gastrostomy tube placement include pneumothorax, visceral puncture or visceral entrapment between the stomach and body wall.

- f. Placement of gastrostomy tube too close to the upper or lower esophageal sphincter can cause protracted vomiting (more of a problem with percutaneous placement without an endoscope).

B. Tubes used for gastrostomy:

1. Latex or silicone Foley (balloon) catheters don't last as long because thin balloon is usually quickly eaten through by gastric acid.
2. Mushroom tipped (Pezzar) 18F-24F latex tubes last longer than Foleys. It is not recommended that the "nipple" be cut off, as this compromises the integrity of the mushroom tip.
3. Pre-adapted Pezzar kits are available from Mill Rose and Cook (see figure 8 below).
4. Low Profile Gastrostomy Devices (LPGD) tubes by Bard can be used as permanent feeding devices for dogs with problems such as megaesophagus who can not take food by mouth (see figure 9 below). These are usually placed following a Pezzar tube, once the stoma is well healed.



C. Gastrostomy tube placement using ELD Device or other Blind Percutaneous Gastrostomy (BPG) tube placement device:

Supplies for ELD or other percutaneous gastrostomy device:

Supplies and equipment for general anesthesia and perioperative pain control.

Pezzar tube appropriate for the size of the dog (sterile), with one-inch tube anchor, and feeding end trimmed to a point.

ELD Device – comes in small and large, or other percutaneous gastrostomy device.

30-60 inches of 2-0 Vetafil (2 pieces).

Tom cat catheter trimmed at a 45° angle, one inch past the tapering point (or 18g Sovereign IV Catheter, trimmed).

18-gauge needle.

1-inch round circle cut out of a new canine AV (artificial vagina), for inner bumper

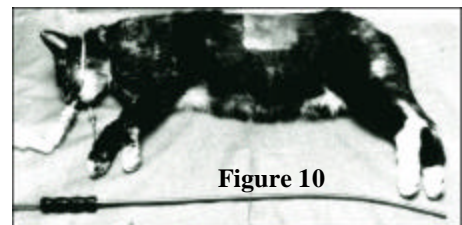
#11 or #15 surgical blade.

Sterile water-based lube.

Small surgical pack, as used for lacerations

Instructions for Percutaneous placement of a Gastrostomy tube using an ELD Device:

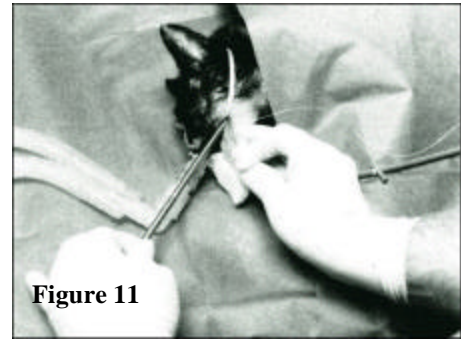
1. Patient should be fasted for 24 hours prior to gastrostomy tube placement.
2. Anesthetize the patient, intubate, and place in right lateral recumbency.
3. Surgically prep an area about 4-5 inches square around the gastrostomy site (see figure 10 right), approximately 1-2 cm caudal to the



costal arch, and on-third the distance from dorsal midline to ventral midline.

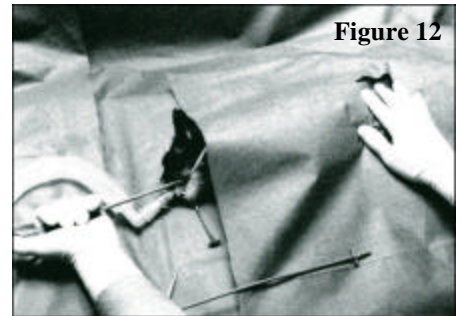
4. Pass the lubricated ELD device with guard in place through the esophagus and into the stomach (see figure 11 right).

- a. Direct the curved tip ventrally as you pass through the pharynx. Gentle traction on the tongue as pictured can help pass through the pharynx.
- b. Then twist the ELD device 180° so that the curved tip is directed dorsally as you pass through the thoracic inlet.
- c. Then twist back 180° as you pass over the base of the heart and into the stomach.
- d. Then twist the curved end back 90°, so that the tip is directed laterally, and can be seen protruding at the gastrostomy site.

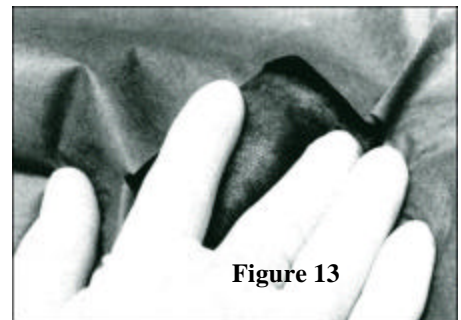


5. Have an assistant hold the ELD device hold the device in place as you don sterile gloves, and palpate the end of the ELD device to make sure it is proper position (see figure 12 right).

- a. Make sure the tip is caudal to the costal arch, so as to avoid penetrating the diaphragm and causing pneumothorax.
- b. Make sure there are no organs (gut or spleen) entrapped between the stomach wall and the abdominal wall
- c. Make sure the tip is not too far caudal, so as to tug on the stomach at the gastrostomy site.



6. When in proper position, place the index finger and middle finger on either side of the tip, and apply gentle pressure (see figure 13 right).

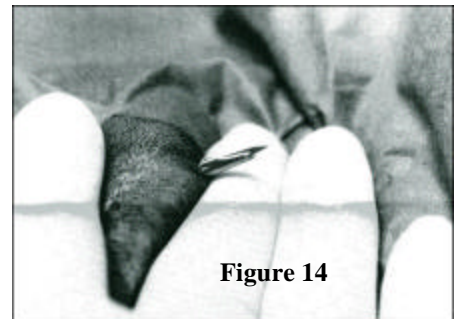


7. Ask your assistant to remove the guard, and push the plunger to pass the trochar through the stomach wall, abdominal wall, and then through the skin. The assistant must understand he/she is to hold the trochar extended with the plunger until you give the signal to release (see figure 14 right).

8. Thread the 30-60 inch piece of Vetafil through the hole in the trochar and pull through so that ends are even. Clamp a hemostat on the ends of the suture, and rest the hemostat on the sterile field.

9. Have your assistant release pressure on the trochar plunger, replace the guard, and gently pull the ELD device back out of the mouth.

10. Release one end of the suture from the hemostat, and re-clamp the hemostat on the remaining end.



11. Instruct your assistant to pull the free end of suture out through the mouth.
12. Thread the free end of the suture into the trimmed tom-cat catheter, small end first.
13. Use the 18-gauge needle as a suture passer, to pass the free end of the suture through the pointed trimmed end of the Pezzar catheter, for 2-4 passes. Pull at least 10-12 inches of suture through each time.

14. Tie the free end and the fixed end of the sutures together with a square knot.
15. Pass the free end of the suture back through the tom cat catheter, big end first.
16. Pulling on both ends of the suture, pull the pointed end of the Pezzar catheter snugly into the tomcat catheter.
17. Pull the free end of the suture rostrally and smoothly along the Pezzar catheter.
18. Lubricate the tube with sterile water soluble gel.
19. A second "safety suture" of Vetafil is placed through the holes in the mushroom tip of the Pezzar catheter. Pull this suture through so both ends are even, and secure with a second hemostat. The safety suture is used to retrieve the feeding tube from the stomach should it becomes detached from the pulling suture during placement (see figure 18 in section D below).
20. Use the first hemostat to pull the suture and attached tube through the gastrostomy site (see figure 15 right).
21. As soon as the tomcat catheter appears through the gastrostomy, pull the free end of the suture through the gastrostomy so that you have 2 sutures to pull the tube through.
22. Grasp sutures, tomcat catheter and the point of the Pezzar tube with the first hemostat, and pull through the gastrostomy until the tube is fully exposed. Resistance will be encountered as you pull the catheter and tube through the gastrostomy. Enlarge the gastrostomy with a scalpel blade if needed (see figure 16 right). Take care to avoid excising the stomach wall.
23. Pull the tube through the gastrostomy by hand, until the mushroom tip can be palpated snugly against the body wall.
24. Release one end of the safety suture from the second hemostat, and pull on the other end to remove the safety suture.
25. See section F below to secure, bandage and remove the gastrostomy tube.



Figure 15

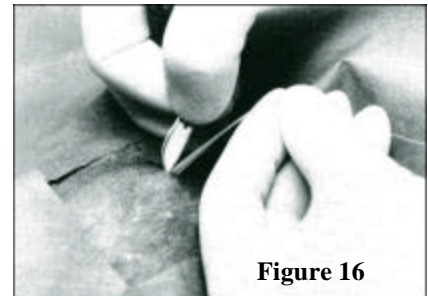


Figure 16

D. Percutaneous Endoscopic Gastrostomy (PEG) tube placement

Supplies for PEG tube placement:

Supplies and equipment for general anesthesia and perioperative pain control

Pezzar tube appropriate for the size of the dog (sterile)

Flexible upper GI endoscope

30-60 inches of 2-0 Vetafil (2 pieces)

Tom cat catheter trimmed at a 45° angle, one inch past the tapering point (or 18g Sovereign)

18-gauge needle

#11 or #15 surgical blade

Sterile water-based lube

Small surgical pack, as used for lacerations

Instructions for placement of a PEG tube:

1. Patient should be fasted for 24 hours prior to PEG tube placement.
2. Anesthetize the patient, intubate, and place in right lateral recumbency.
3. Surgically prep an area about 4-5 inches square around the gastrostomy site (see

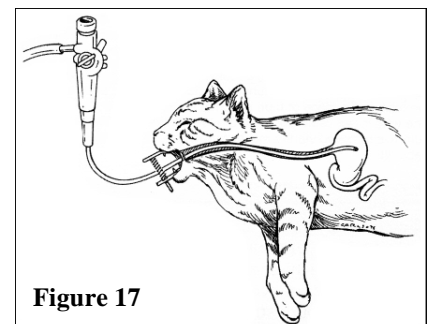


Figure 17

figure 8, section C), approximately 1-2 cm caudal to the costal arch, and on-third the distance from dorsal midline to ventral midline.

4. Pass the lubricated endoscope through the esophagus and into the stomach.
5. Insufflate the stomach with air, so that the gastric wall comes into contact with the abdominal wall, and the spleen is displaced caudally (see figure 17 previous page).
6. Direct the tip of the endoscope against the fundus as it contacts the body wall. The lighted tip of the endoscope will be seen pressing upward against the abdominal wall.
7. Have an assistant pass an 18-gauge needle or around the needle catheter perpendicular to and through the skin just adjacent to the tip of the endoscope, and pass it through the abdominal wall and gastric wall, until the hub is snug against the skin (see figure 18 right). Air will be released as you enter the stomach lumen.
8. Have the assistant thread one end of the 30-60 inch piece of Vetafil through the 18-gauge needle and into the stomach.
9. The other end should be secured by grasping with a hemostat.
10. Use the retrieval endoscopic forceps to grasp the free end of the Vetafil and pull it out through the mouth as the endoscope is withdrawn (see figure 19 right).
11. Thread the free end of the suture into the trimmed tom-cat catheter, small end first.
12. Use the 18-gauge needle as a suture passer, to pass the free end of the suture through the pointed trimmed end of the Pezzar catheter, for 2-4 passes. Pull at least 10-12 inches of suture through each time.
13. Tie the free end and the fixed end of the sutures together with a square knot.
14. Pass the free end of the suture back through the tom cat catheter, big end first.
15. Pulling on both ends of the suture, pull the pointed end of the Pezzar catheter snugly into the tomcat catheter.
16. Pull the free end of the suture rostrally and smoothly along the Pezzar catheter.
17. A second "safety suture" of Vetafil is placed through the holes in the mushroom tip of the Pezzar catheter (see figure 20 right). Pull this suture through so both ends are even, and secure the ends with a second hemostat. The safety suture is used to retrieve the feeding tube from the stomach should it become detached from the pulling suture during placement.
18. Lubricate the tube with sterile gel.
19. Use the first hemostat to pull the suture and attached tube through the gastrostomy site (see figure 21 right).
20. As soon as the tomcat catheter appears through the gastrostomy, pull the free end of the suture through the gastrostomy so that you have 2

Figure 18

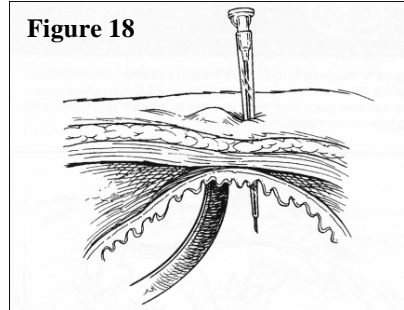


Figure 19

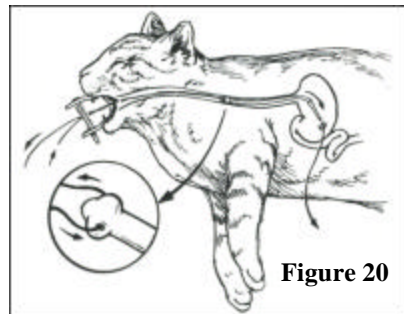
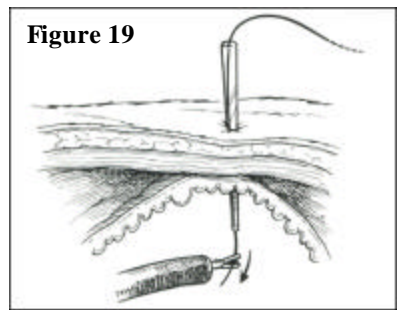


Figure 20

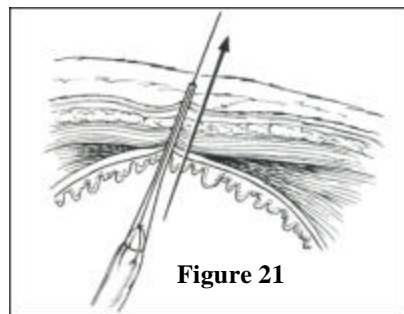


Figure 21

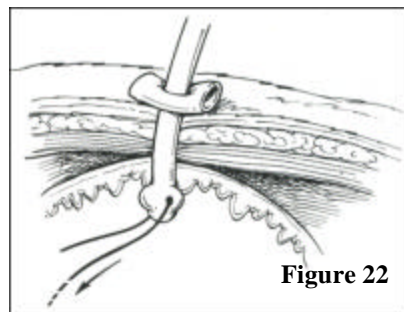


Figure 22

sutures to pull the tube through. Grasp sutures, tomcat catheter and the point of the Pezzar tube with the first hemostat, and pull through the gastrostomy until the tube is fully exposed. Resistance will be encountered as you pull the catheter and tube through the gastrostomy (see figure 21 previous page). Enlarge the gastrostomy with a scalpel blade if needed. Take care to avoid excising the stomach wall.

21. Pull the tube through the gastrostomy by hand, until the mushroom tip can be palpated snugly against the body wall.
22. Release one end of the safety suture from the second hemostat, and pull on the other end to remove the safety suture (see figure 22 on the previous page).
23. Reinsert the endoscope to make sure mushroom tip is snug against the mucosa, and not too close to either the upper or lower gastric esophageal sphincter.
24. See section F below to secure, bandage and remove the gastrostomy tube.

E. **Surgical placement of gastrostomy tube** is the ideal gastrostomy tube method for dogs larger than 40 pounds. Their stomach capacity is large, and the stomach needs to be firmly attached to the body wall at the gastrostomy site. Stomach tubes can be placed using this percutaneous flank approach, or by laparotomy.

Supplies for surgical placement of gastrostomy tube:

- Supplies and equipment for general anesthesia and perioperative pain control
- Pezzar tube appropriate for the size of the dog (sterile)
- General surgery pack
- #11 surgical blade
- 2-0 PDS or Maxon
- 2-0 non-absorbable suture

This method can be used, or a gastrostomy tube can be placed similarly during exploratory laparotomy. Instructions for surgically placing a gastrostomy tube:

1. Patient should be fasted (no food) for 24 hours prior to surgery.
2. Anesthetize the patient, intubate and place in right lateral recumbency.
3. Clip and surgically prepare the left flank area. Gastrostomy site will be in the left paracostal area, just caudal and parallel to the last rib, with its dorsal limit just below the ventral edge of the paravertebral musculature.
4. Have an assistant pass a large bore stiff plastic stomach tube into the stomach, and manipulate until the tube is against the left body wall.
5. Don sterile gloves and palpate the left flank area, then grasp the end of the stomach tube.
6. Hold the tube stable, and make a skin incision over the end of the tube.
7. Bluntly dissect the subcutaneous tissues and abdominal musculature, to expose the wall of the stomach over the tube; take care not to enter the lumen of the stomach.
8. Place a purse-string suture in the stomach wall around the tube, using 2-0 PDS or Maxon (see figure 23 right).
9. Use a #11 surgical blade to make a stab incision into the stomach lumen, over and into the end of the stomach tube.

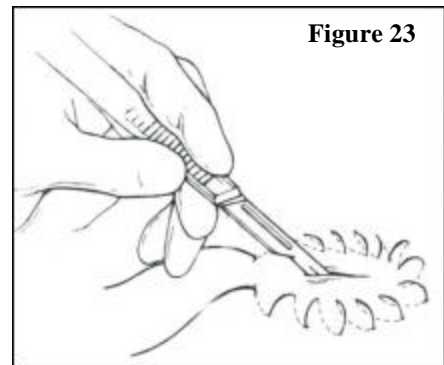


Figure 23

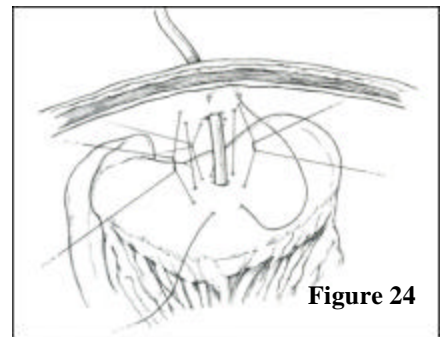
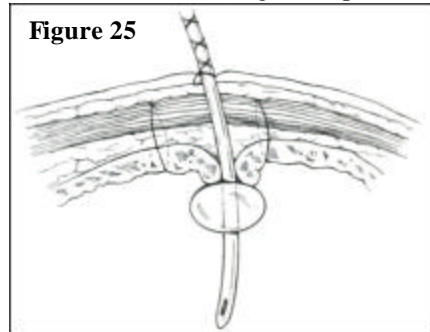


Figure 24

10. Place the mushroom tip end of a Pezzar catheter into the gastrostomy site, and into the stomach tube.
11. Snug and tie the purse string suture around the mushroom tip. Take care not to apply excessive tension on the purse string, to avoid pressure necrosis of the stomach wall.
12. Have the assistant carefully remove the stomach tube.
13. Pre-place 3-4 simple interrupted stay sutures (2-0 PDS or Maxon) through in the stomach, and firmly pexy each to the adjacent abdominal wall (see figure 24 previous page).
14. Put gentle traction on the Pezzar catheter, withdrawing until the mushroom tip is snug against the stomach wall (see figure 25 right).
15. Close muscle, subcutaneous tissues and skin around the gastrostomy tube in a routine manner.
16. See section F below to secure, bandage and remove the gastrostomy tube.

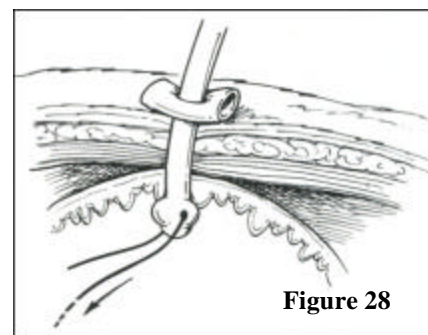
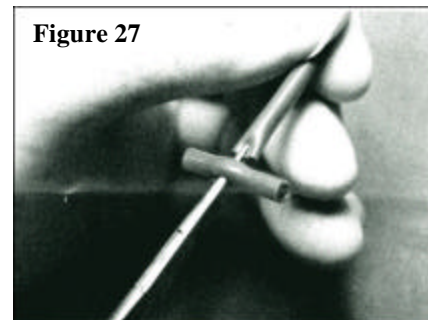
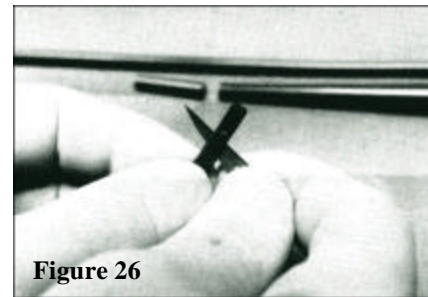


F. Securing, bandaging and removing the gastrostomy tube :

Supplies:

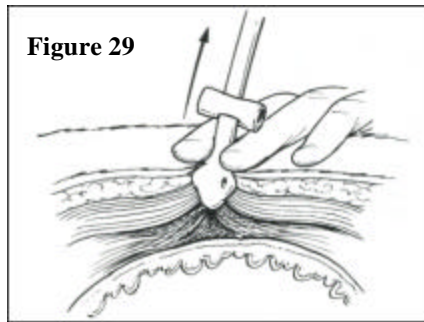
- 2-0 non-absorbable suture, to attach tube to skin
- Bandage material, stockinette or infant t-shirt, to protect the tube.
- Plug for the end of the tube
- 10 days broad spectrum prophylactic antibiotics

1. Use a scalpel blade or scissors to make a stab incision mid-length in the tube anchor (see figure 26 right).
2. Pass a hemostat through the stab incision, open them, and grasp the pointed end of the tube (see figure 27 right).
3. Pull the pointed end of the tube through the tube anchor, and snug the tube anchor to the body wall (see figure 28 right and below). Add a white tape butterfly to keep the tube anchor phlange in place, if desired.
4. Use a Chinese finger cot suture pattern to secure the tube in to skin (alternate crossing behind, and surgeon's knot in front, until the cot reaches the desired length).
5. Allow the pet to recover from anesthesia, and then secure the tube as desired
 - a. Some like to bandage, with 4x4 with antibiotic ointment on the gastrostomy.
 - b. Some like the bandage secured with a piece or two of tape, and then the tube protected with an e-collar, infant t-shirt or stockinette.
 - c. Heavy bandages can restrict breathing during anesthetic recovery, especially in obese pets.
6. I usually start feeding via the tube the next day.
7. The tube must stay in place for at least 10 days before it is removed. It takes this long for a strong gastropexy to form, preventing



leakage of ingesta into the abdomen, and subsequent peritonitis when the gastrostomy tube is removed. Cats sometimes form poor gastropexy adhesions.

8. The stomach should be empty when the tube is removed. Sedation is generally not required for G-tube removal, unless the patient is particularly fractious.
9. To remove the tube, first cut and remove the suture attaching the finger cot to the skin. Grasp the tube with the right hand, and brace the abdominal wall with the left (see figure 29 and 30 below), to provide counter pressure. Exert firm traction on the tube until it is removed. Keep bandaged for a day or two, until healed.



10. A second method of removal in dogs large enough to pass the mushroom tip is to trim the mushroom tip off at the body wall and push it into the stomach. This is not recommended in small dogs or cats, as it can cause intestinal obstruction.
11. A third method of removal is to thread a stylet into the tube to flatten the mushroom tip while applying traction to remove the tube.
12. Administer broad spectrum antibiotics, such as penicillin, potentiated penicillin or cephalosporin, for 10 days after gastrostomy tube placement.

G. What to do if the G-tube is removed prematurely

1. If removed before the stomach wall is well adhered to the abdominal wall.
 - a. Endoscopy to evaluate the gastrostomy site and replace the PEG tube.
 - b. Exploratory surgery if evidence of perforation and peritonitis
2. If removed after stoma is well healed
 - a. Can replace Pezzar tube with a PEG procedure or LPGD.
 - b. Can replace tube with a Foley type catheter.
 - c. Can place a low profile gastrostomy device (LPGD).

H. Contraindications for gastrostomy tube placement:

1. profuse vomiting
2. decreased consciousness
3. conditions where the stomach can not be easily apposed to the abdominal wall.
 - a. Ascites
 - b. Adhesions
 - c. Space occupying masses
4. primary gastric disease
 - a. gastritis
 - b. gastric ulceration
 - c. gastric neoplasia

V. Jejunostomy tube

- A. Ideal for pets with gastric or pancreatic disease
 - 1. advantages
 - a. Can give consistent nutrition when patient is vomiting can not be controlled.
 - b. Minimal stimulation of the pancreas
 - 2. disadvantages
 - a. requires abdominal surgery for placement
 - b. only liquid diets can be administered
 - c. food must be administered by CRI most of the time (some patients will tolerate frequent small bolus feedings)

- B. Tubes used for jejunostomy
 - 1. 5F-8F jejunostomy tubes , usually 36 inches

- C. Supplies for jejunostomy placement
 - 1. Supplies and equipment for general anesthesia and perioperative pain control
 - 2. infant feeding tube appropriate for the size of the pet (sterile)
 - 3. General surgery pack
 - 4. surgical blades
 - 5. 3-0 and 4-0 absorbable suture material
 - 6. 2-0 non-absorbable suture, to attach tube to skin
 - 7. Bandage material, stockinette or infant t-shirt, to protect the tube.
 - 8. 10 days broad spectrum prophylactic antibiotics

- D. Placement instructions for jejunostomy tube
 - 1. Patient should be fasted for 24 hours prior to surgery.
 - 2. Anesthetize the patient, intubate, and place in dorsal recumbency.
 - 3. Clip and surgically prepare the skin for a ventral midline Laparotomy, as well as an area of skin on the right or left abdominal wall for the jejunostomy site.
 - 4. Make a 2-3 mm stab incision through the skin, subcutaneous tissues and abdominal wall of the right or left abdomen, as prepared.
 - 5. Use hemostats to pass the distal end of a 5-8F infant feeding tube through the jejunostomy site and into the abdomen.
 - 6. Select a segment of jejunum that can be easily mobilized to the jejunostomy site on the body wall. Run the gut to determine which direction is oral, and which is aboral.
 - 7. Make a 1-1.5 cm partial thickness longitudinal incision through the peritoneum and the muscle layers at the anti-mesenteric border of the selected jejunal segment.
 - 8. Gently milk intestinal contents away from partial thickness incision, and occlude flow of ingesta back to the enterotomy site, using Doyen intestinal forceps, sterile bobby pins, or an assistant's fingers. Handles of Allis tissue forceps wrapped in moistened gauze can also be used.
 - 9. Use a #11 scalpel blade to enter the lumen of the jejunum at the aboral end of the partial thickness incision.
 - 10. Insert the distal end of the feeding tube through that incision and into the jejunum, passing 10-12 inches of tubing into the jejunum in an aboral direction.
 - 11. Nestle the exiting portion of the tube into the "tunnel" formed by the partial thickness incision.
 - 12. Invert the seromuscular layer over the tube with three or four Cushing suture of 4-0 absorbable suture material..
 - 13. Pre-place four simple interrupted sutures along the feeding tube exit site, to be pexied to the abdominal wall, using 3-0 absorbable suture material.
 - 14. Secure the feeding tube to the skin using 2-0 non-absorbable suture material, in a Chinese finger cot.
 - 15. Close the abdomen as usual.
 - 16. After the patient recovers, place an abdominal bandage to secure the jejunostomy tube.

E. Contraindications for jejunostomy tube

VI. Care of feeding tubes

- A. See Appendix 5 for tube feeding diets.
- B. See Appendix 6 for tube feeding instructions.
- C. Feeding tube bandages should be changed every 3-7 days, or more if needed.
 - 1. remove bandage
 - 2. clean around the ostomy site
 - 3. apply fresh dressing to the ostomy
 - a. dry gauze of telfa if the ostomy is clean
 - b. antimicrobial ointment if any discharge
 - a. triple antibiotic ointment
 - b. povidone iodine ointment
 - c. furacin ointment
 - d. silvadene cream
 - 4. Change bandage material.
 - 5. If tape butterflies are use to secure the tube to skin, the tape can be trimmed without removing the sutures, and suture tags taped back to the tube.