Nasogastric Tubes

**Brief Overview:** Nasogastric tubes are commonly used within patient care for both diagnosis and treatment. Primarily they are used for gastric and proximal decompression of the upper gastrointestinal (GI) tract. This module is designed to teach the proper indications, contraindications, complications, insertion, and maintenance of nasogastric tubes.

I. **Objectives**

At the end of this session the students will be able to:

1. Describe the indications for insertion of a nasogastric tube.
2. Describe the conditions under which a gastric tube should be inserted orally rather than nasally.
3. Describe the supplies needed for the task.
4. Insert the catheter into a mannequin, model, or human volunteer using proper technique, demonstrating how to ensure that the tip is in the stomach, that the catheter is properly secured, and that the catheter is connected to a drainage bag or suction.
5. Explain the possible complications of a nasogastric tube insertion.

II. **Assumptions**

- Student should know the anatomy of the nasal turbinates, naso- and oropharynx, esophagus, and stomach.
- Student should know the indications, contraindications, and possible complications of a nasogastric tube.
- Student should know how a sump tube works, including the function and care of the air vent.

III. **Suggested Readings**


IV. Description of the Laboratory Module

Using a commercially available double-lumen sump tube, the student will demonstrate the placement of a nasogastric tube in an appropriate mannequin, model, or human volunteer, including securing it appropriately to the nose and face while attaching it to a wall suction unit, suction tubing, or a drainage bag.

V. Description of Techniques and Procedure

Steps as follows:

1. Describe indications for insertion of a nasogastric tube:
   a. Adynamic ileus
   b. Small bowel or gastric outlet obstruction
   c. Severe burns or multiple trauma
   d. Intestinal surgery with an anastomosis
   e. Gastric lavage for bleeding or poison ingestion
   f. Endotracheal intubation with positive pressure ventilation
   g. Abdominal surgery (minimally invasive or open)

2. Describe patient preparation and positioning:
   a. Explain the procedure, risks, and alternatives and answer any questions
   b. Ask about previous history of nasal fracture or difficulty with previous nasogastric tube insertion
   c. In the case of a trauma patient, check for evidence of facial fracture, cerebrospinal fluid leak from the nose or ears, and for raccoon’s eyes
      - In the presence of a possible cribriform plate fracture, the gastric tube is inserted orally because of the danger of intracranial placement of a nasally inserted tube
      - In the case of the trauma patient with a known or suspected cervical spine injury, care is needed to maintain in-line cervical spine traction during insertion of the nasogastric tube
   d. An awake patient without spinal consideration will be placed in the upright (sitting) or decubitus position with the neck flexed forward

3. Explain equipment and supplies needed:
   a. Gloves and eye protection
   b. 16F–18F nasogastric tube (adults)
   c. Lubricant jelly (lidocaine jelly may be used)
   d. Optional topical nasal vasoconstrictor (phenylephrine)
   e. Optional topical anesthetic (benzocaine, butamben, and tetracaine)
   f. Emesis basin
   g. Towel or disposable pad for patient’s chest
   h. Tissues
   i. Tongue blade
   j. Glass of water with a straw
k. Irrigation set with 60 ml catheter-tip syringe
l. Stethoscope
m. Penlight/otoscope/flashlight (to visualize oropharynx and nares)

n. Hypoallergenic tape or commercially available tube-securing device

o. Benzoin liquid (need cotton-tipped applicators if benzoin comes in a bottle)
p. Safety pin and rubber band (to secure tube to patient gown)
q. Drainage bag or suction tubing if connected to wall suction

r. Wall or portable suction, suction tubing, and tonsil-tip (Yankauer) suction tube

4. Demonstrate how to estimate the proper length of tube to be inserted:
   a. Proper length is distance from tip of nose to ear (fig. 1) in addition to distance from ear to xiphoid process (fig. 2).

   ![fig 1: Distance from earlobe to tip of nose](image1)

   ![fig 2: To the distance from earlobe to xiphoid process](image2)

   b. Student may also indicate that end of tube can be wrapped around the fingers to create a curve that facilitates insertion.
   c. If a marking pen is not available, student should note where the length to be inserted is in relation to the available markings on the tube or mark the length with a piece of tape.

5. Demonstrate how to choose the most patent nostril (fig. 3).

   ![fig 3: Using a penlight to find the most patent nostril](image3)
6. Demonstrate (or explain, in the nonliving model) the application of topical anesthetic to the back of the throat and the nasal mucosa, as well as the application of the vasoconstrictor to the nasal mucosa.

7. Demonstrate the lubrication of both the catheter tip and the length of the catheter (fig. 4).

![Image of catheter lubrication](image)

**fig. 4:** *Lubricate catheter liberally for several inches; lidocaine jelly may be used*

8. Indicate that suction is turned on and tonsil tip is attached.

9. Ask patient to remove glasses and dentures and drape patient’s chest with a towel or a disposable pad.

10. Give patient an emesis basin, tissues, and a glass of water with straw. Make sure the patient knows there will be some gagging during placement.

11. With the patient’s neck flexed, insert tube into the nostril chosen (fig. 5). Apply firm, constant pressure, having the patient take small sips of water and swallowing while doing so. It may be helpful to pause when the tube enters the oropharynx, then advance the tube 2 to 4 inches with each swallow of water (fig. 6).

![Image of catheter insertion](image)

**fig. 5:** *Catheter insertion*

**fig. 6:** *It may be helpful to pause when the tube enters the oropharynx*
12. Once the tube is inserted, demonstrate:
   a. Holding the tube in place close to the nostril (steadying hand on patient’s nose) (fig. 7).

   ![fig. 7: Demonstrating catheter stabilization](image)

   b. Holding the taping in place, taping the tube first to the upper lip as it exits down from the nostril, then pulling the tube across the ipsilateral cheek (fig. 8).

   ![fig. 8: Taping the tube](image)

   - Alternatively, a long piece of tape may be split lengthwise for half its length.
   - The undivided portion is taped longitudinally to the nose with the two split ends hanging down over the nose. The latter are then wrapped around the nasogastric tube (NGT) as it exits the nostril. The tube should not be in forcible contact with the cartilage of the nose.

13. Demonstrate the injection of 30–60 ml of air into the tube while listening to the epigastrium for the whoosh of air as it enters the stomach (fig. 9). Student should then aspirate to confirm the presence of gastric content and the need to order a radiograph for placement.
14. Connect the tube to wall suction or drainage bag, pin tube to patient’s gown, and demonstrate proper position of air vent (above the patient’s stomach).

VI. Common Errors

- Attempted insertion of an NGT in someone for whom this is contraindicated:
  a. Patient with facial trauma or other symptoms of possible cribiform plate fracture
  b. Patient with recent nasal trauma or surgery
  c. Anti-coagulated patient (relative: insertion must be completely atraumatic)
- Nasal, nasopharyngeal, or oropharyngeal trauma due to insufficient lubricant
- Pain with catheter insertion
  Basis: 2% lidocaine jelly can be used as the lubricant and topical anesthetic sprays can be used in the nose and throat.
- Tube coils in the mouth or esophagus
  Basis: Chill tube in ice to stiffen it.
- Tube doesn’t pass through nostril
  Basis: Try the other side.
- Patient begins to cough during insertion
  Basis: Withdraw immediately. The tube is passing into the airway.
- Erosion of the skin/cartilage of the nostril
  Basis: Tape catheter to upper lip or tip of nose first, then across the cheek so that catheter does not pull on the edge of the nostril cartilage.
- Misplacement in trachea (more common during insertion in unconscious patients)
  Basis: Confirm placement by aspiration of gastric contents, injection of air, and radiograph before using tube.
- Trauma to pharynx and esophagus
  Basis: Do not force tube against resistance.
- Aspiration pneumonia
- Sinusitis secondary to swelling around sinus orifices
  Basis: This may be the cause of fever in a patient with an NGT.
• Leakage of gastric content from air vent
  Basis: Flush air vent with saline followed with 20 ml of air, then position air vent above the level of the patient’s stomach. The NGT should be flushed with 30 ml of saline every four hours and as needed to keep it patent. Air vent should be flushed with air at the same time.

VII. Supplies and Station Set-up:

• Mannequin, model, or human volunteer (latter seated)
• Bedside table
• Gloves and goggles
• 16F–18F nasogastric tube
• Lubricant jelly (lidocaine jelly may be used)
• Optional topical nasal vasoconstrictor (phenylephrine)
• Optional topical anesthetic (benzocaine, butamben, and tetracaine)
• Emesis basin
• Towel or disposable underpad
• Tissues
• Tongue blade
• Pen light/flashlight/otoscope
• Irrigation set with 60 ml catheter-tip syringe
• Glass of water with straw
• Stethoscope
• Hypoallergenic tape
• Benzoin liquid or commercially available tube-securing device (cotton-tipped applicators will be needed if benzoin comes in a bottle)
• Safety pin and rubber band
• Drainage bag or suction tubing to attach to wall suction
• Wall or portable suction, suction tubing, tonsil-tip (Yankauer) suction tube

This module may take place in a simulation facility, an OSCE facility, or after hours in a clinic or PACU-type area. The station may also be set up in a conference room on a table.

Ensure that the model or simulator works with lidocaine jelly and other “real” gels and solutions. Many models come with their own lubricants that must be used with that model or simulator. Full-body simulators that sit in the upright position will need a chair; those that lay supine will need a long table, stretcher, or bed.

Personnel necessary include set-up personnel and a proctor.

VIII. Suggested Module Length

One hour and 15 minutes to one hour and 30 minutes total:

• Fifteen minutes for set-up
• Thirty minutes of instruction if student has not read/reviewed videos/references prior to session
• Fifteen minutes of instruction if student has read/reviewed videos/references prior to session
• Fifteen minutes for completion of module

Note: Multiple students can be taught at the same time prior to individual performance of the module.

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