Feeding tubes

Enteral feeding

- simple, physiologic, and relatively inexpensive
- maintains the GI tract cytoarchitecture and mucosal integrity (via trophic effects), absorptive function, and normal microbial flora.
- less bacterial translocation and endotoxin release from the intestinal lumen into the bloodstream.

Enteral feeding

Enteral feedings are indicated for patients who have a functional GI tract but are unable to sustain an adequate oral diet.

Enteral feedings may be contraindicated in patients with an intestinal obstruction, ileus, GI bleeding, severe diarrhea, vomiting, enterocolitis, or a high-output enterocutaneous fistula.

Various commercially available enteral formulas are available. Standard solutions provide 1 kcal/mL; calorically concentrated solutions (>1 kcal/mL) are available for patients who require volume restriction.

The available dietary formulations for enteral feedings can be divided into polymeric (blenderized and nutritionally complete commercial formulas), chemically defined formulas (elemental diets), and modular formulas

Enteral feeding

It is recommended to start with a full-strength formula at a slow rate, which is steadily advanced. This reduces the risk of microbial contamination and achieves goal intake earlier.

Conservative initiation and advancement are recommended for patients who are critically ill, those who have not been fed for some time, and those receiving a high-osmolarity or calorie-dense formula.

Enteral feeding

Bolus feedings

reserved for patients with nasogastric or gastrostomy feeding tubes.

Feedings are administered by gravity, begin at 50 to 100 mL every 4 hours, and are increased in 50-mL increments until goal intake is reached (usually 240 to 360 mL every 4 hours).

The patient's head and body should be elevated to 30 to 45 degrees during feeding and for 1 to 2 hours after each feeding (to avoid aspiration).

The gastric residual volume should be measured before administration of the feeding bolus. If this volume is greater than 50% of the previous bolus, the next feeding should be held.

The feeding tube should be flushed with approximately 30 mL of water after each use.

Enteral feeding

Continuous infusion

Administered by a pump is generally required for nasojejunal, gastrojejunal, or jejunal tubes.

Feedings are initiated at 20 mL/hour and increased in 10- to 20-mL/hour increments every 4 to 6 hours until the desired goal is reached.

The feeding tube should be flushed with approximately 30 mL of water every 4 hours.

The entire day's feeding can be infused over 8 to 12 hours at night to allow the patient mobility free from the infusion pump during the day.

Enteral feeding

Conversion to oral feeding

When supplementation is no longer needed, an oral diet is resumed gradually. In an effort to stimulate appetite, enteral feeding can be modified by the following measures:

a. **Providing fewer feedings.**

b. **Holding daytime feedings.**

c. **Decreasing the volume of feedings.** When oral intake provides approximately

75% of the required calories, tube feedings can be stopped.

Predictive equation: Harris-Benedict

The equation used for males is:

- BMR (kcal per day) = 66.5 + (13.8) weight in kg + (5) height in cm - (6.76) * age in years.

The equation used for females is:

- BMR (kcal per day) = 655 + (9.6) weight in kg + (1.85) height in cm - (4.68) * age in years.

Table 2-3 Disease Stress Factors Used in Calculation of Total Energy Expenditure

Clinical Condition	Stress Factor
Starvation	0.80–1.00
Elective operation	1.00–1.10
Peritonitis or other infections	1.05–1.25
Adult respiratory distress syndrome or sepsis	1.30–1.35
Bone marrow transplant	1.20–1.30
Cardiopulmonary disease (noncomplicated)	0.80–1.00
Cardiopulmonary disease with dialysis or sepsis	1.20–1.30
Cardiopulmonary disease with major surgery	1.30–1.55
Acute renal failure	1.30
Liver failure	1.30–1.55
Liver transplant	1.20–1.50
Pancreatitis	1.30–1.80

Enteral feeding

- nasoenteric tubes are the first means of gaining enteral access in the vast majority of patients.
- A more permanent feeding tube should be considered if enteral support will be needed for more than four to five weeks
- The patient is unable to maintain adequate nutrition with oral feeds alone. In most cases nutritional support should be considered if recommended daily requirements will not be met for more than about seven days in adults
- The patient bowel function is relatively normal
- Ability to obtain a route of enteral access safely.

GASTRIC FEEDING

Advantages

- **More physiologic**

Intragastric feeds buffer gastric acid better than post-pyloric feedings

- **Ease of placement**
- **Convenience**

stomach can tolerate a larger volume and higher osmotic load

Disadvantages

- **Delayed gastric emptying**
- **Gastroesophageal reflux and aspiration**

POST-PYLORIC FEEDING

The most common indications for post-pyloric feedings include:

- Pulmonary aspiration.
- Severe gastroesophageal reflux (GER) and esophagitis.
- Recurrent emesis.
- Post surgery/multiple trauma.
- Abnormal gastric dysmotility.

POST-PYLORIC FEEDING

Advantages

- **Minimize aspiration risk**
- **Role in critically ill patients**

deliver adequate nutrition without the need for parenteral nutrition.

prevents gastric distension, thus potentially allowing for better respiratory function

- **Benefits in acute pancreatitis**

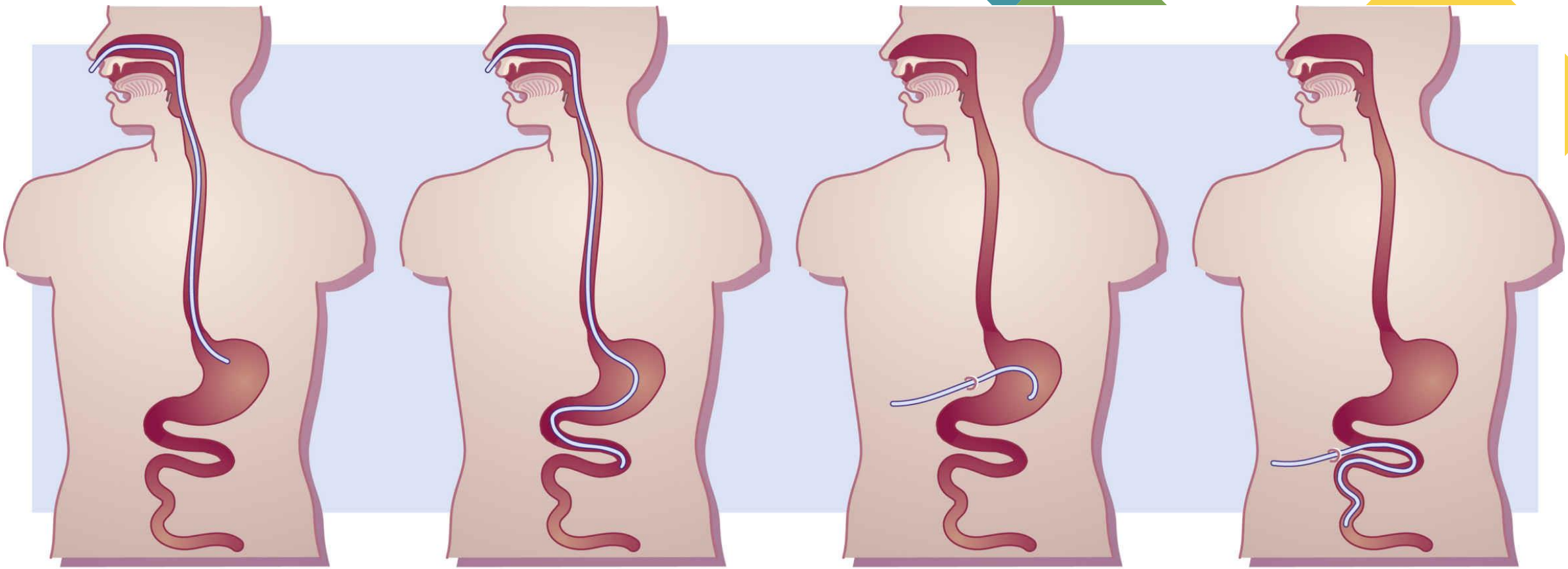
minimize the stimulation of pancreatic exocrine secretions,

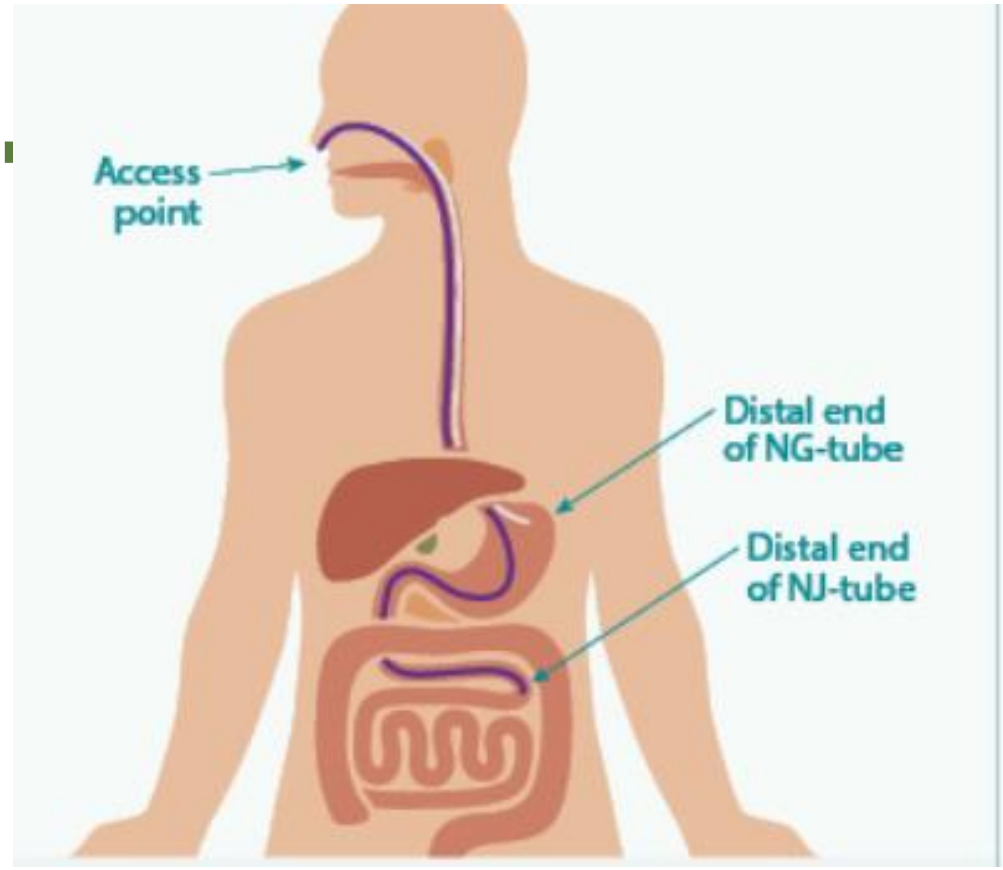
Disadvantages

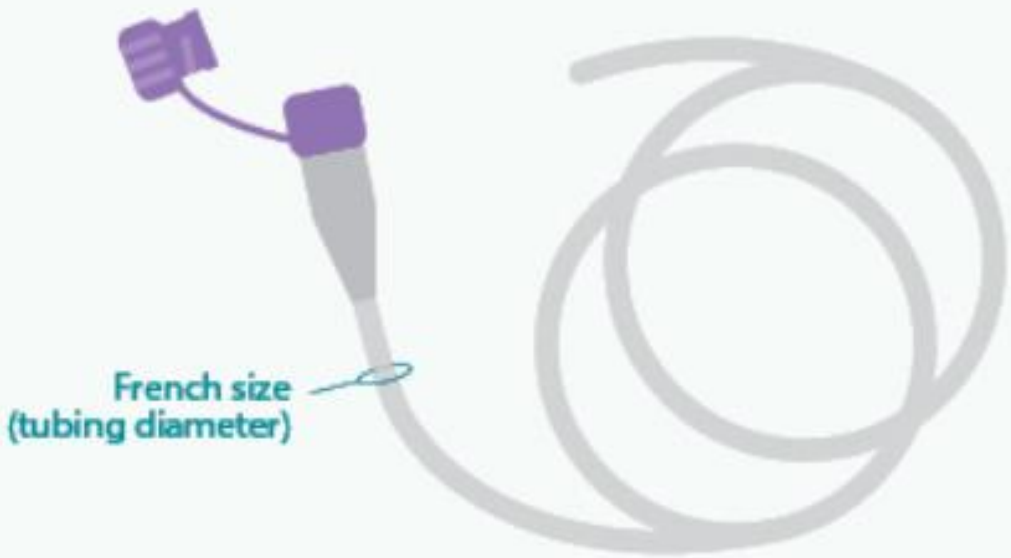
- **Difficulty with placement and ease of displacement**
- **Feeding intolerance**

types

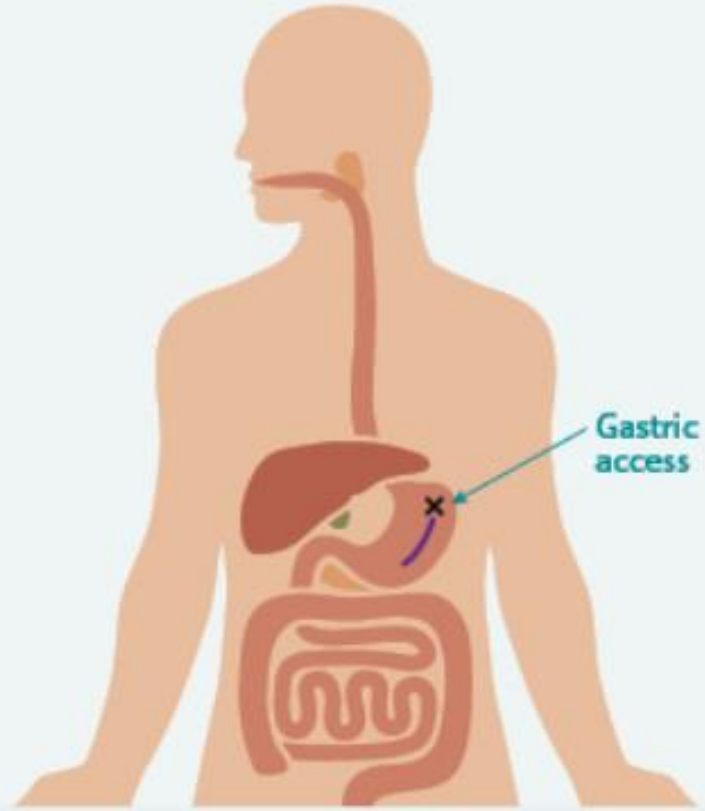
- Nasogastric
- Nasojejunal
- Gastrostomy
- Jejunal tubes

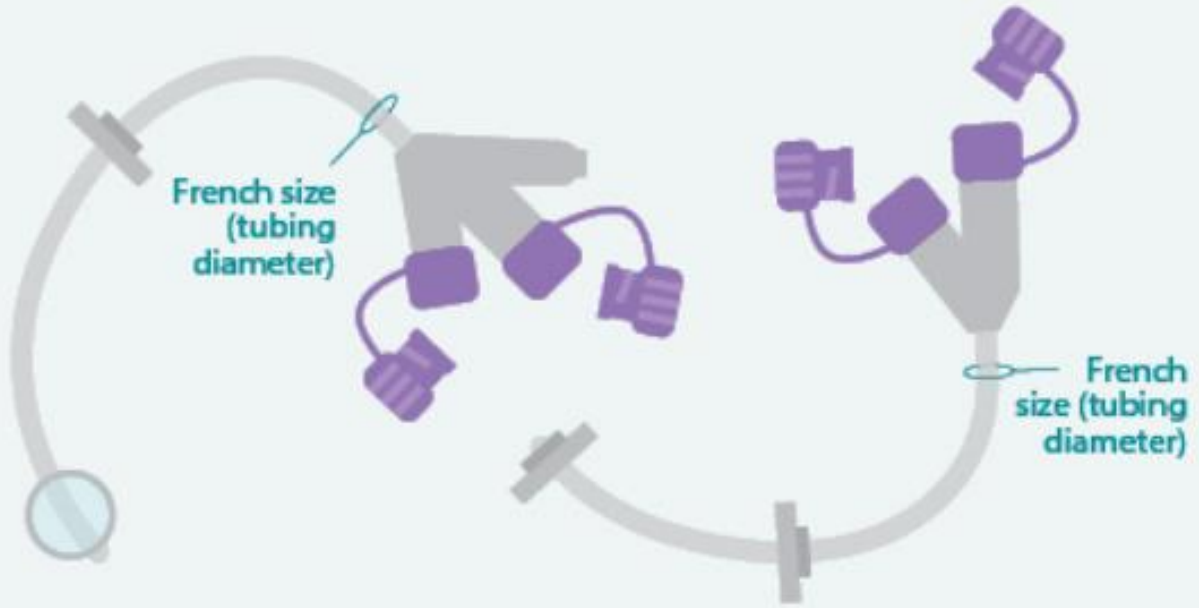

Nasogastric
Nasoduodenal/nasojejunal
Gastrostomy
Jejunostomy



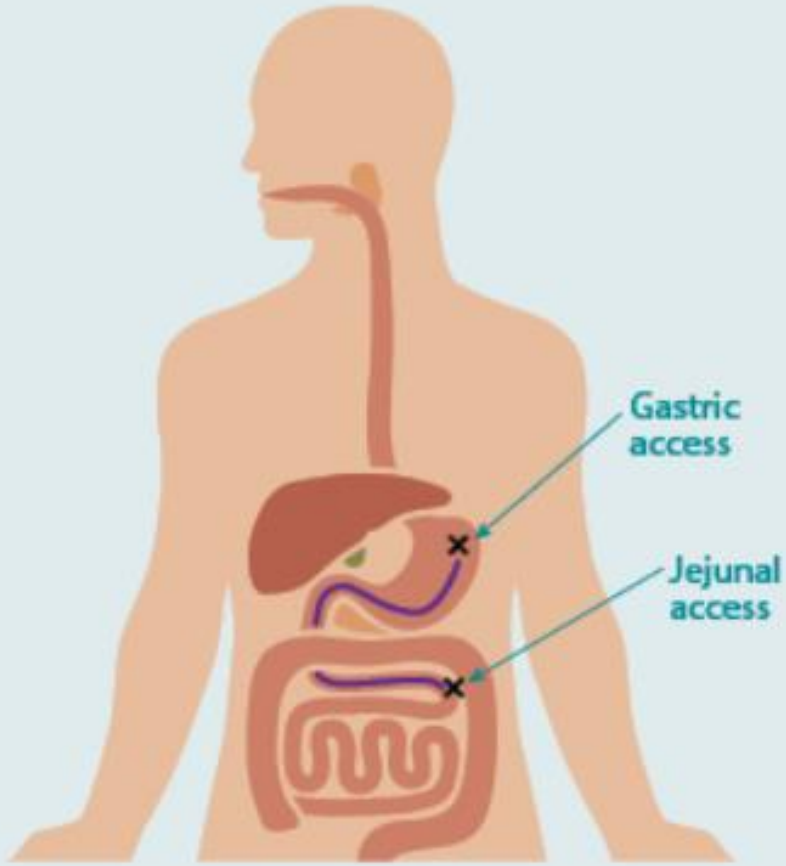


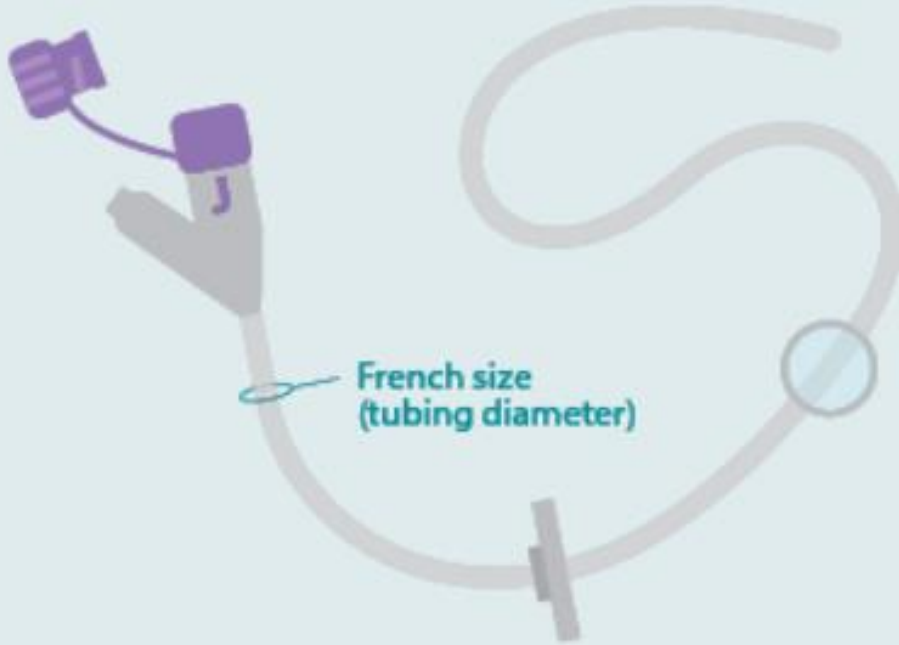
Nasal tubes are available in variety of French sizes and lengths.





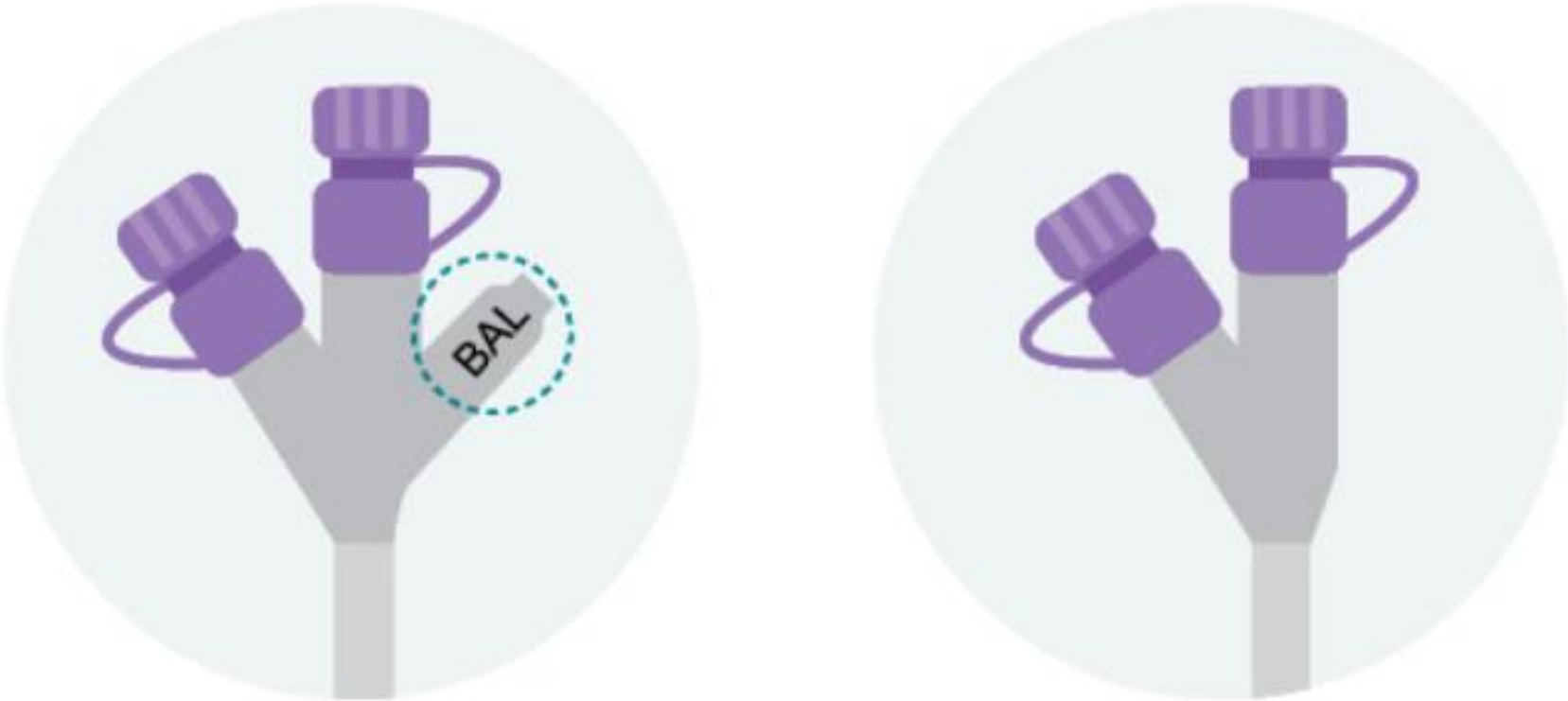
Standard-profile gastrostomy tubes (above left) are available in different French sizes and lengths. **PEG tubes** (above right) are available in a standard length and are then cut to the desired length.



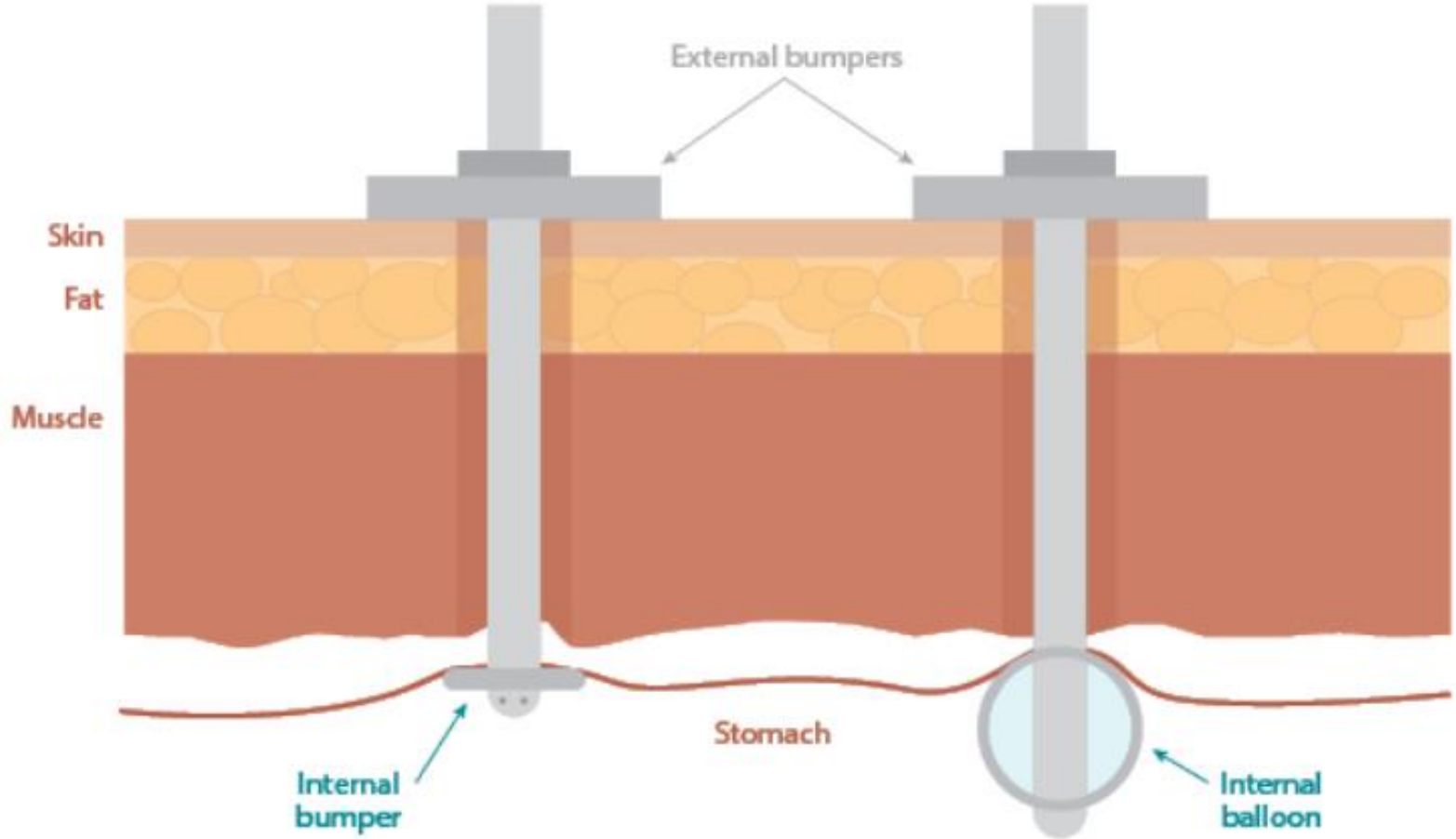


Standard-profile jejunostomy tubes are available in different French sizes with a limited selection of jejunal length.

To identify a balloon or non-balloon tube from the outside, look for a port labeled with the letters "BAL."



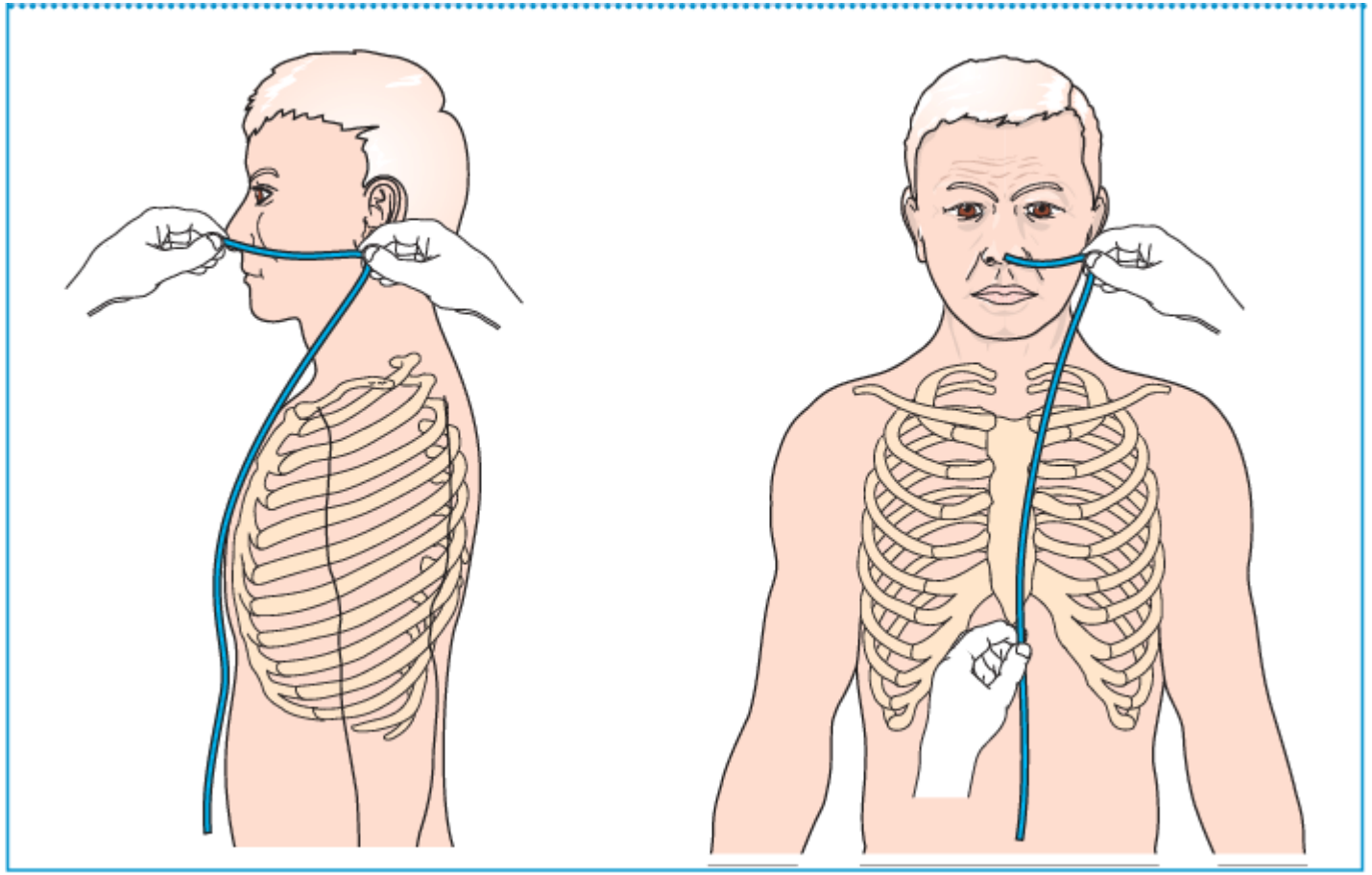
If a balloon port is visible (above left), it is a balloon style tube.



Both non-balloon tubes and balloon tubes have internal mechanisms to prevent the tube from being pulled out: **non-balloon tubes** (above left) use a soft disc or bumper, while **balloon tubes** (above right) use an internal balloon.

Measurement of the insertion length of NG tube

- Position the patient sitting upright with their head in a neutral position.
- Estimate how far the NG tube will need to be inserted: measure from the bridge of the nose to the ear lobe and then down to 5 cm below the xiphisternum.



Insertion of NG tube

1. Lubricate the tip of the NG tube.

2. Insert the NG tube through one of the patient's nostrils.

3. Gently advance the NG tube through the nasopharynx

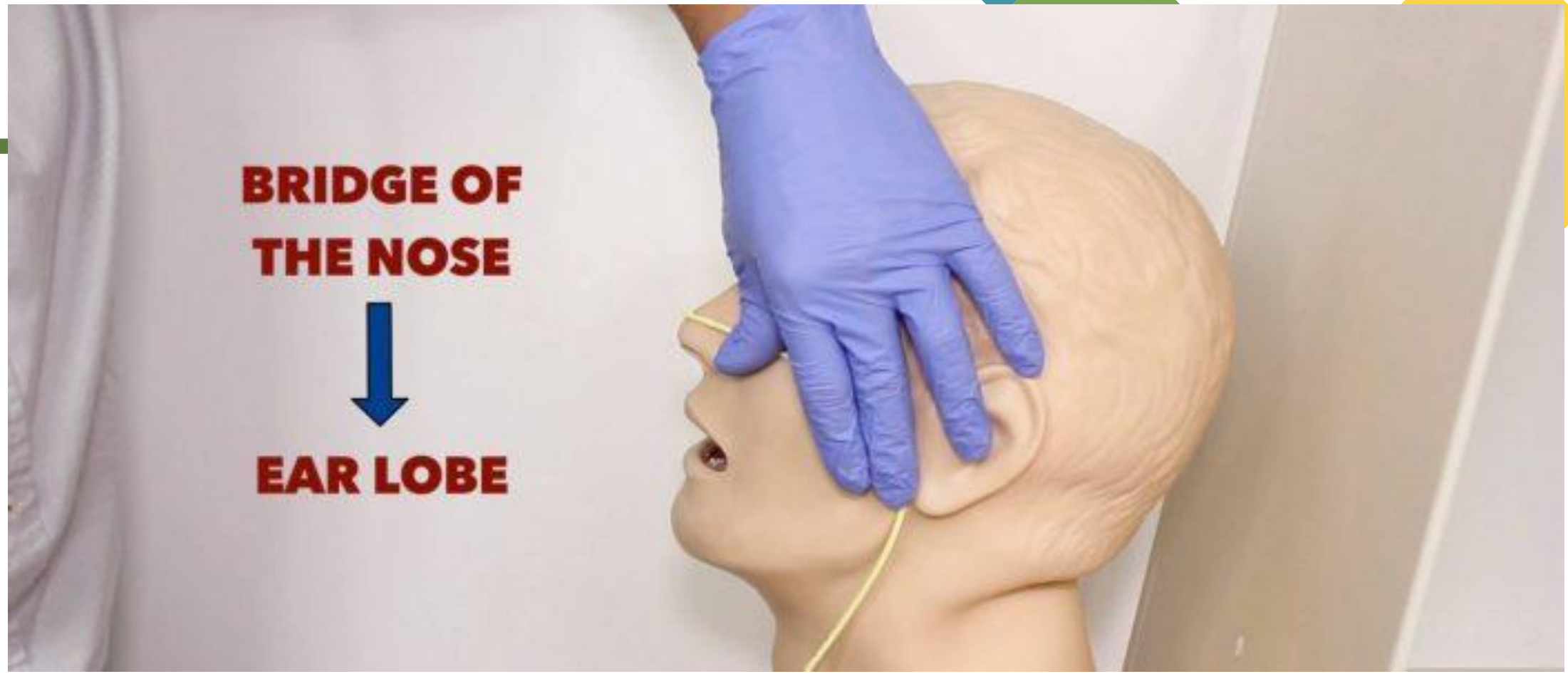
4. Continue to advance the NG tube down the oesophagus.

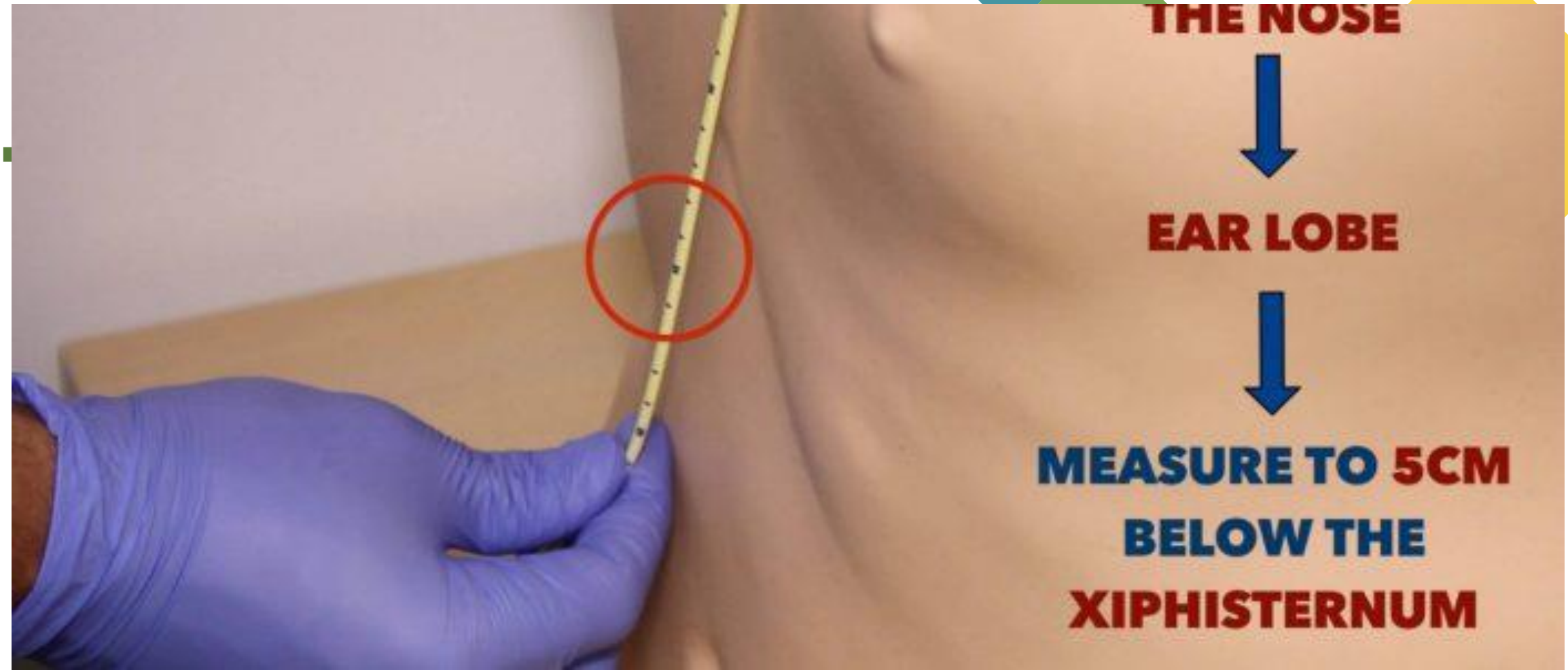
5. Once you reach the desired nasogastric tube insertion length, fix the NG tube to the nose with a dressing.

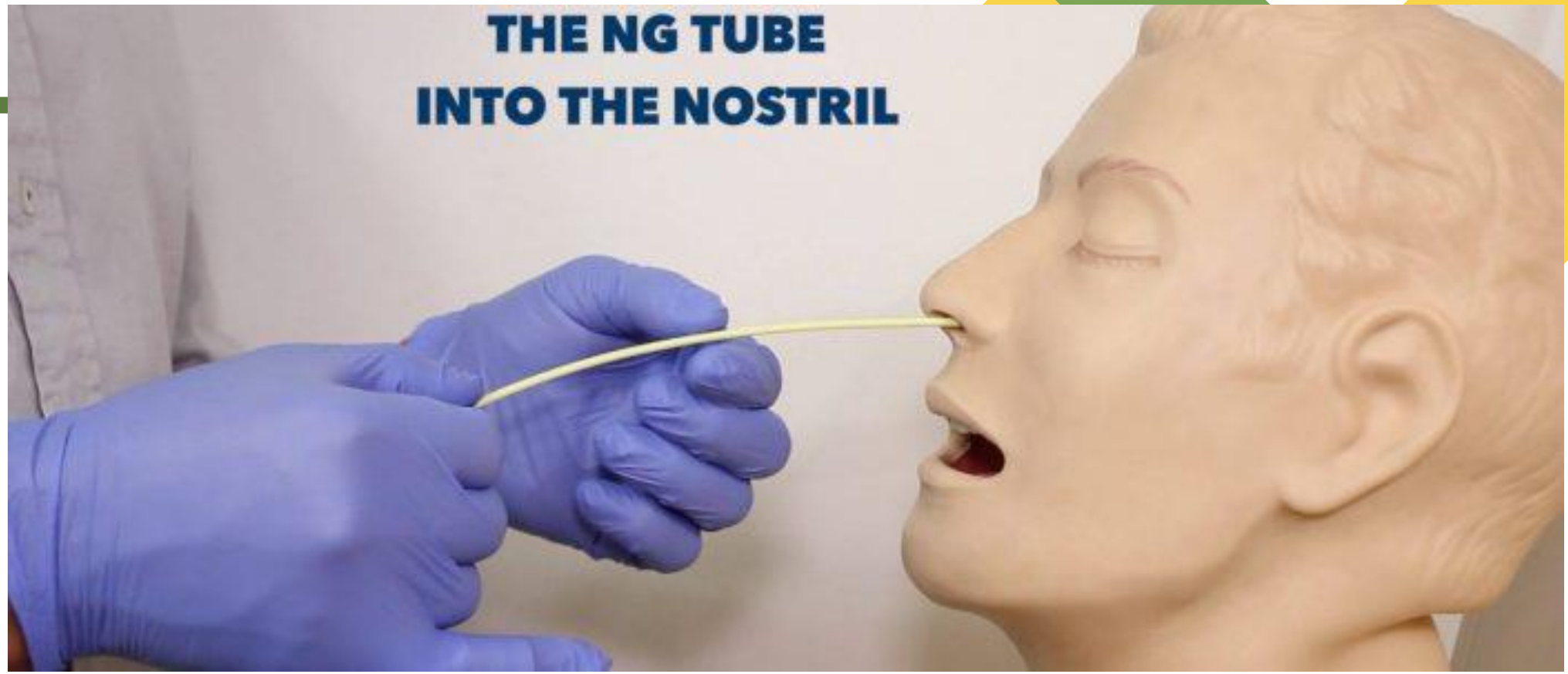
- This is often the most uncomfortable part for the patient.
- If resistance is met, rotating the NG tube can aid insertion. Avoid forcing the NG tube if significant resistance is encountered.
- If the patient becomes distressed, pause to give them some time to recover.
- Intermittently inspect the patient's mouth to ensure the NG tube isn't coiling within the oral cavity.

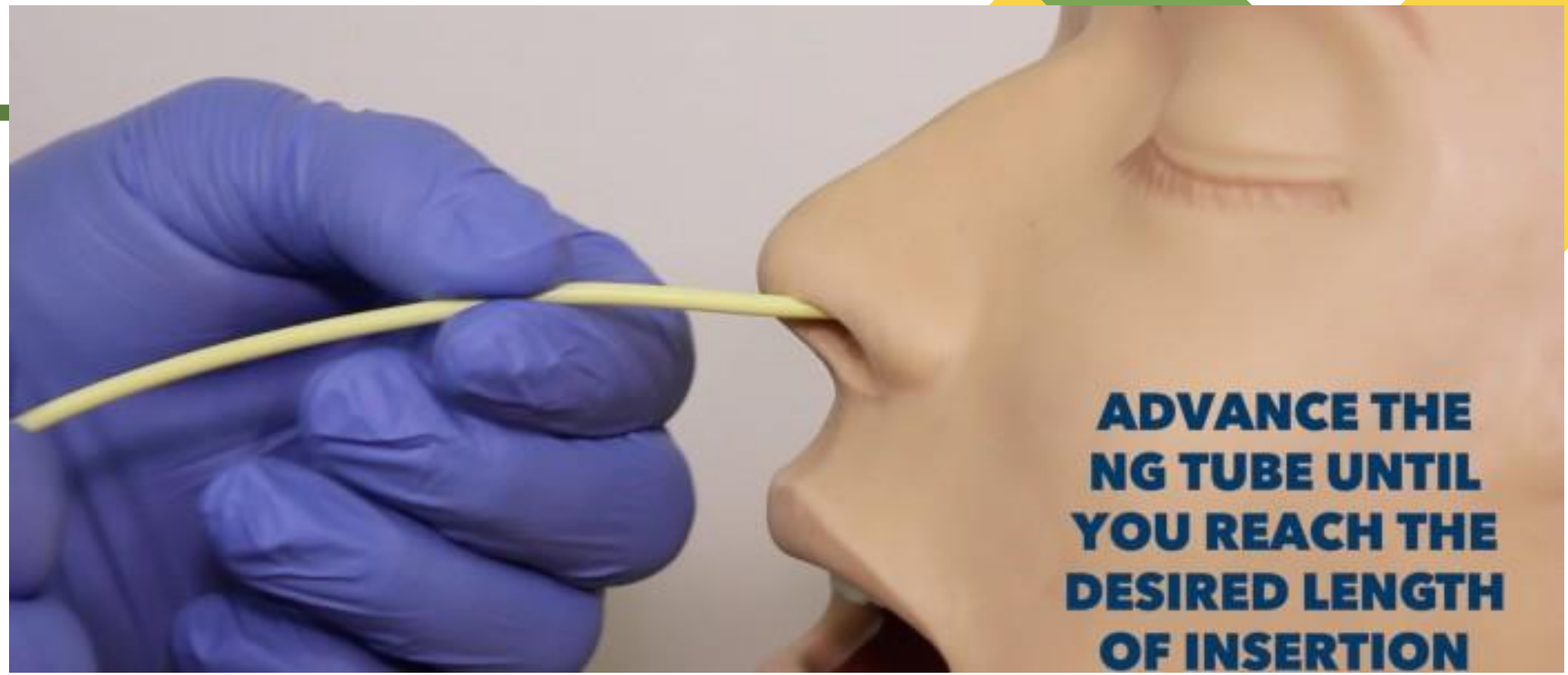
ask the patient to take some sips of water and then swallow as this can facilitate the advancement of the NG tube.

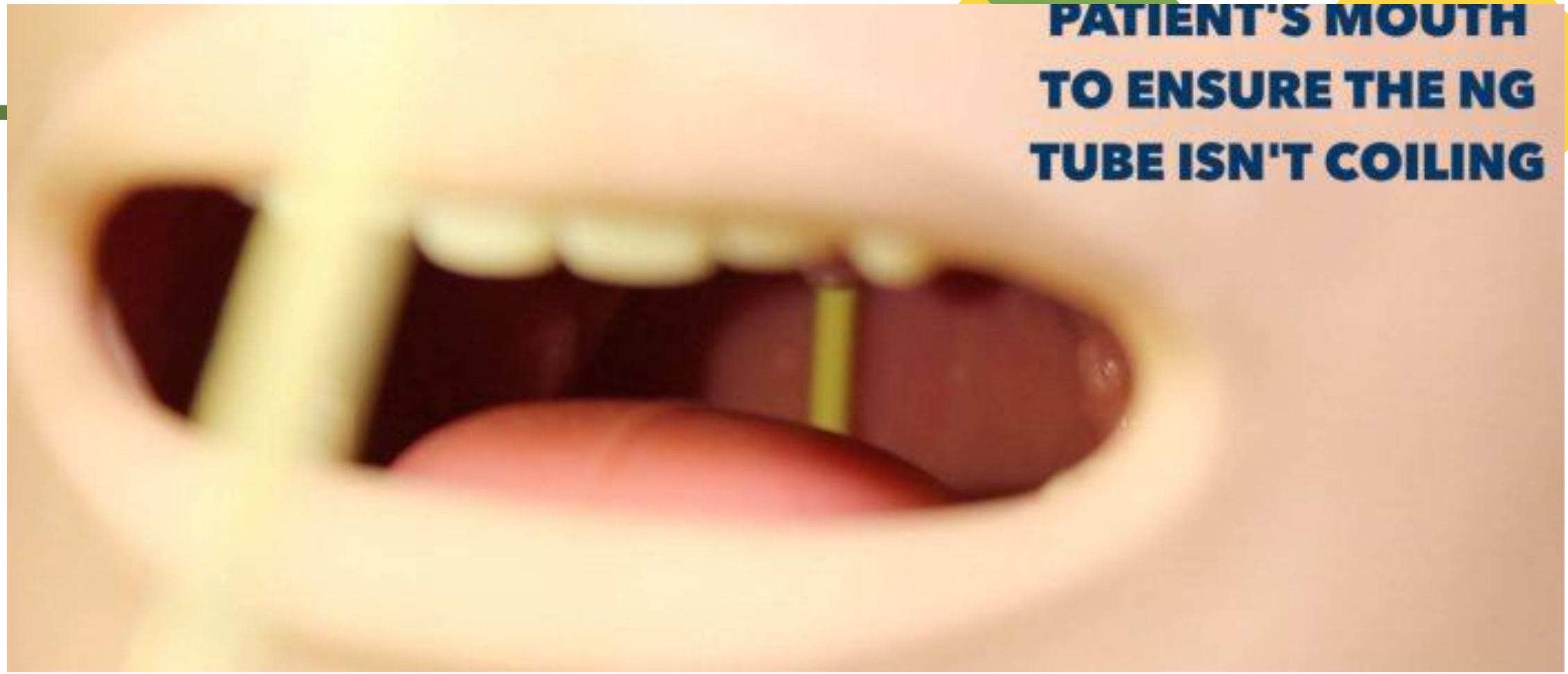
Avoid giving patients a drink if their swallow is deemed unsafe, due to the risk of aspiration.


BRIDGE OF
THE NOSE
EAR LOBE


THE NOSE
EAR LOBE
MEASURE TO 5CM
BELOW THE
XIPHISTERNUM


THE NG TUBE
INTO THE NOSTRIL

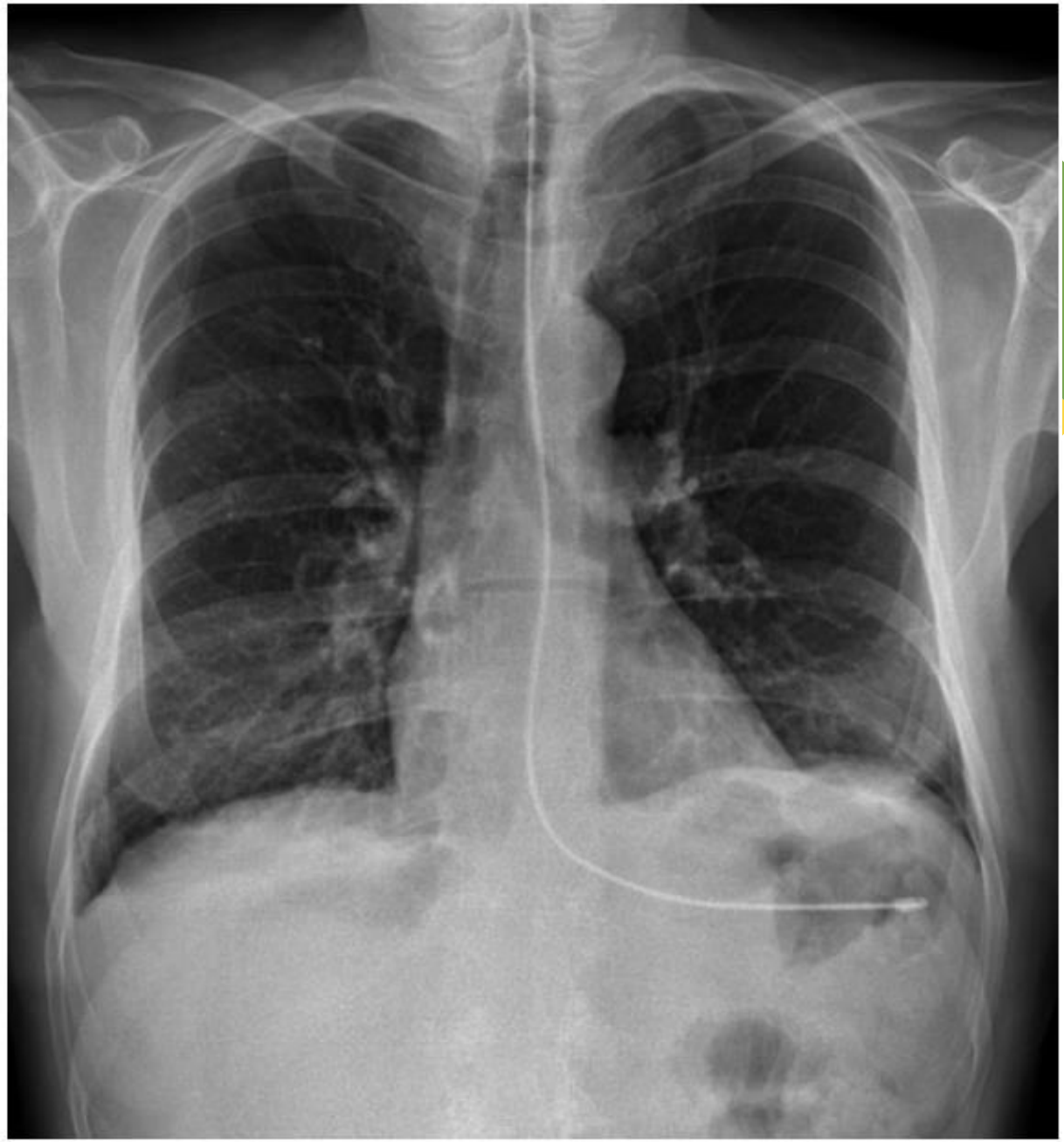

ADVANCE THE
NG TUBE UNTIL
YOU REACH THE
DESIRED LENGTH
OF INSERTION

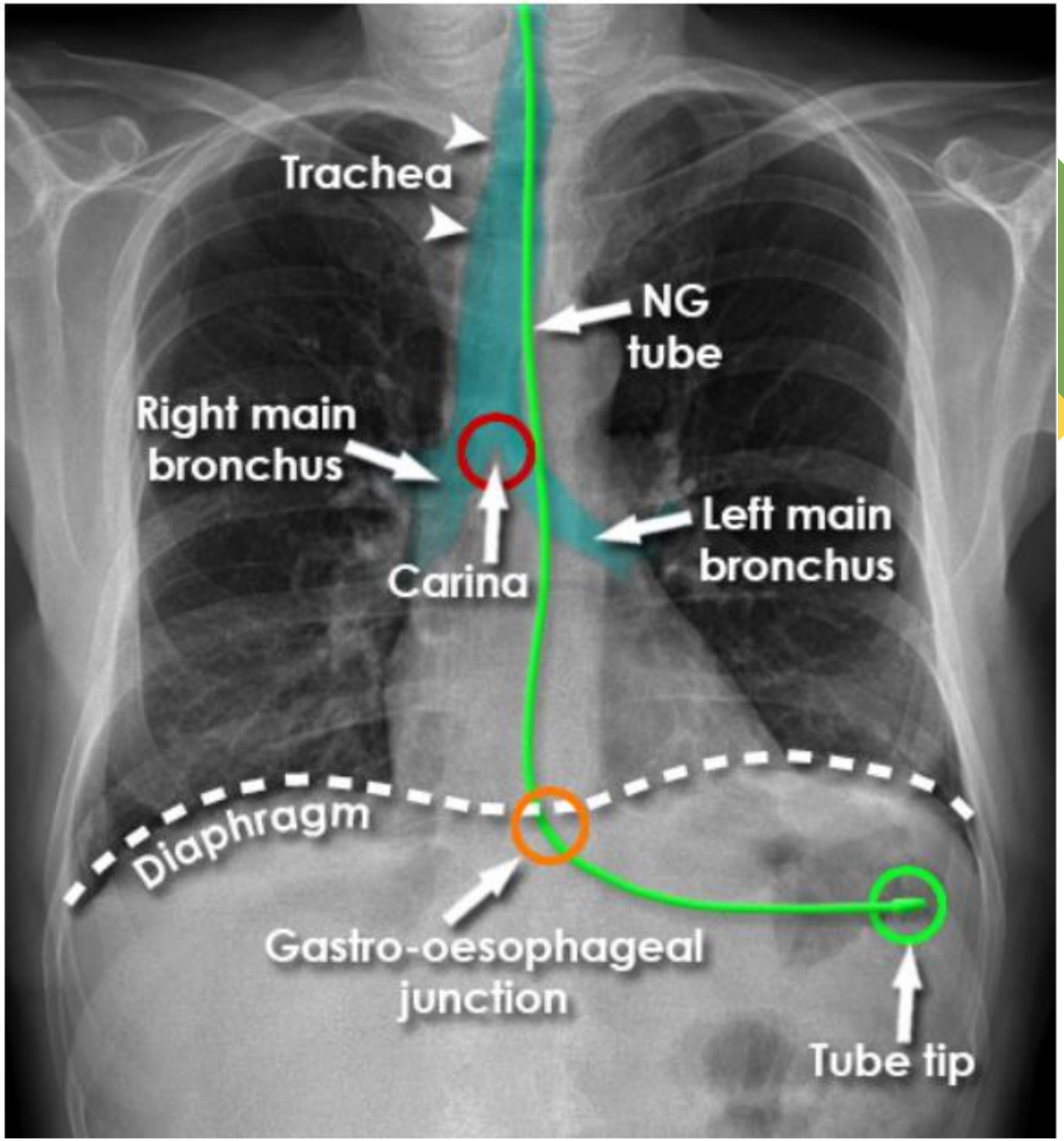

PATIENT'S MOUTH
TO ENSURE THE NG
TUBE ISN'T COILING


NG TUBE

Aspiration from the NG tube

You may test the pH: a value of <4 suggests correct placement in the stomach.




Trachea
NG tube
Right main bronchus
Carina
Left main bronchus
Diaphragm
Gastro-oesophageal junction
Tube tip

complications

- Metabolic derangements (**Hypernatremia** , **Hyperglycemia**).
- Clogging
- Tracheobronchial aspiration
- High gastric residuals
- Diarrhea

Potential nasoenteric tube complications
Arrhythmia
Empyema
Gastric perforation
Myocardial infarction
Otitis media
Pulmonary intubation
Tube feeding into pulmonary tree
Clogging
Epistaxsis
Gastrointestinal bleeding
Nasal mucosal ulceration
Pneumothorax
Pyriform sinus perforation
Tracheobronchial trauma
Tube dislodgment
Duodenal perforation
Esophageal perforation
Knotted tubes
Nasal trauma
Pulmonary aspiration
Reflux esophagitis, ulceration, or stricture
Tracheoesophageal fistula
Tube obstruction


Complete Enteral
Nutritional Formula
1.2 Cal
Enteral
Enteral

Thank you