Gastrointestinal Intubation

Learning Objectives

On completion of this lecture, the students will

- Define intubation.
- List six reasons for gastrointestinal (GI) intubation.
- Identify four general types of GI tubes.
- Name at least four assessments that are necessary before inserting a tube nasally.
- Explain the purpose of and how to obtain a NEX measurement.
- Describe three techniques for checking distal placement in the stomach.
- Name two common problems associated with transabdominal tubes.
- Name four schedules for administering tube feedings.
- Explain the purpose for assessing gastric residual.
- Name five nursing activities involved in managing the care of clients who are being tube-fed.

The gastric or intestinal tubes may be required in some clients, especially those undergoing abdominal or gastrointestinal (GI) surgery. It may be used to reduce or eliminates problems associated with surgery or conditions affecting the GI tract such as impaired peristalsis, vomiting, or gas accumulation. Tubes also can nourish clients who cannot eat.

INTUBATION

- **Intubation** means the placement of a tube into a body structure.
- **Orogastric intubation** (insertion of a tube through mouth into stomach).
- **Nasogastric intubation** (insertion of a tube through the nose into stomach.
- N**asointestinal intubation** (insertion of a tube through the nose to the intestine).

Indications of Gastric or intestinal tubes

- Performing a **gavage** (providing nourishment)
- Administering **oral medications** that the client cannot swallow
- **Obtaining a sample** of secretions for diagnostic testing
- Performing a **lavage** (removing substances from the stomach, typically **poisons**)
- Promoting **decompression** (remove gas & liquid contents from the stomach or bowel)
- **Controlling gastric bleeding**, a process called compression or **tamponade** (pressure)

TYPES OF TUBES

The outside diameter of most tubes is measured using the **French scale**, indicated by a number followed by the **letter "F."** Each number on French scale equals ≈ 0.33 mm.

Orogastric Tubes

An **orogastric tube** (tube inserted at mouth into stomach), is **used in an emergency to remove** ingested **toxic substances**. **The** tube's **diameter is large** e.g. (Ewald tube).

Nasogastric Tubes (NGT)

- A **nasogastric tube** (from nose to stomach) is **small in diameter**. Gastric double-lumen **tubes** are used almost to remove fluid & gas from stomach.

- NGT can cause **nose & throat discomfort** & may contribute to **gastric reflux**.

Nasointestinal Tubes

Nasointestinal tubes (tubes inserted through nose for distal placement below stomach) are **longer than gastric counterparts**.

- ***Feeding Tubes:*** used to provide nourishment
- ***Intestinal Decompression:*** used to remove gas & liquid from small intestine

Transabdominal Tubes

- **They are** tubes inserted through abdominal wall to provide access to various parts of GIT e.g. **gastrostomy tube** (within stomach) & **jejunostomy tube** (leads to jejunum).

NASOGASTRIC TUBE MANAGEMENT

Management of NGT involves: **insertion of nasogastric tubes**, **keep tube patent** (or unobstructed); **implement prescribed use** & **remove tube** when it accomplished its purpose.

a) Insertion

Client Preparation

Most clients are **anxious** about having to swallow a tube as:

- Suggest that the tube diameter is smaller than most pieces of food.
- Explain procedure & give instructions on how client can assist while tube is passed.
- Establish with the client a signal, such as raising the hand, to indicate that client needs a pause during the tube's passage.

Preintubation Assessment

1. **Level Of Consciousness**; Weight; Bowel sounds; Abdominal distention; Integrity of nasal and oral mucosa; Ability to swallow, cough, and gag & nausea and vomiting
2. **Nasal Inspection**
   - Ask the client to **clears nasal debris** by blowing into a paper tissue
   - **Inspects each nostril** for size, shape, and patency.
   - Nostril Exclusion (**nasal polyps**, **deviated septum**, or a **narrow nasal passage**).
3. **Tube Measurement**
   - Obtains client's **NEX measurement** (Nose - Earlobe - Xiphoid process).
   - **First** tube **mark** is made at the distance from nose to earlobe. It indicates **distance to nasal pharynx**, location **above where gag reflex is stimulated**.
   - A **second mark** is made at the point where the tube reaches the **xiphoid** process, indicating the **depth required to reach the stomach**.

Tube Placement

When inserting NGT, the nurse's primary concerns are to ***cause as little discomfort as possible***, to ***preserve nasal tissue integrity*** & ***locate tube within stomach***.

***CHECKING* PLACEMENT**

1. **Aspirating fluid**: If clear, brownish-yellow, or green (from stomach).
2. **Auscultating abdomen**: Instills 10 mL or more of air, listening with a stethoscope over abdomen. If a **swooshing sound** is heard, the cause was air entering stomach.
3. **Testing the pH of aspirated liquid**: confirms acidic gastric contents.
4. Obtaining an **abdominal x-ray**.

Once placement is confirmed, **secures tube to avoid upward or downward migration**.

b) Use and Maintenance

Gastric Decompression

Suction is either continuous or intermittent. Vented tube or intermittent suction prevents or minimizes localized irritation & allows drainage. Low pressure (40 - 60 mm Hg) is used.

Promoting Patency: ice chips or sips of water to NPO client to promote tube patency.

Restoring Patency: Monitor the volume and characteristics of drainage and observe for signs & symptoms suggesting **obstruction** (**nausea, vomiting & abdominal distention**). Sometimes the nasogastric tube must be irrigated to maintain or restore patency.

Enteral Nutrition

- **Enteral nutrition** (nourishment via stomach or small intestine) by tube feeding.
- Liquid formula will be administered through a nasointestinal or transabdominal tube.

c) Removal

Nasogastric tube is removed when:

- The client's condition improves
- The tube becomes hopelessly obstructed,
- According to agency's standards for maintaining the integrity of the nasal mucosa.
- **Unobstructed larger-diameter tubes** are changed at least **/2-4 weeks for adults**.
- **Small diameter, flexible tube** are removed & changed **every 4 weeks - 3 months**.
- Tubes used for **pediatric clients** are changed **more frequently**.
- Before removal, tube is clamped & client is allowed to consume oral fluids.
- Remaining asymptomatic (no nausea, vomiting or gastric distention) is a good indication.

NASOINTESTINAL TUBE MANAGEMENT

Insertion: to estimate the length of tube required for intestinal placement, determines the NEX measurement and adds 9 inches (23 cm).

Checking Tube Placement

- Tube placement is always initially verified with an x-ray.

- The aspiration technique after an initial x-ray, it involves using a large-volume (50-mL) to obtain a sample of fluid, therefore, provides enough fluid to test the pH.

TRANSABDOMINAL TUBE MANAGEMENT

- The physician inserts transabdominal tubes, such as gastrostomy and jejunostomy tubes, but nurse is responsible for assessing and caring for them & their insertion sites.
- Conscientious care is necessary; gastrostomy tubes may leak & cause skin breakdown.

TUBE FEEDINGS

Tube feedings are used when clients have an intact stomach or intestinal function but are:

1. Undergone extensive mouth surgery	2. Unconscious
3. Have difficulty swallowing	4. Have esophageal or gastric disorders.

Benefits and Risks

- Uses the body's natural reservoir for food
- Reduces the potential for enteritis (inflammation of the intestine)
- Gastric feedings increase the potential for gastric reflux
- Tube's Placement within intestine reduces risk of gastric reflux.

Additional problems are associated with intestinal tube feedings.

- Intestinal tube may lead to **dumping syndrome** (symptoms from rapid deposition of calorie-dense nourishment into small intestine). Symptoms include **weakness, dizziness, sweating, and nausea**, caused by **fluid shifts from circulating blood to intestine** & **low blood glucose level** related to a **surge of insulin**.
- **Diarrhea** also may result when administering hypertonic formula solutions.

Formula Considerations

- The type of formula is individualized, based on the client's nutritional needs.
- Factors include the **client's weight**, **nutritional status**, and **concurrent medical conditions** and the projected **length of therapy**.
- Feeding schedule affects choice of formula: calories may need to be concentrated if client is being fed several times a day. Most provide **0.5 to 2.0 kcal/mL** of formula.

Tube-Feeding Schedules

Tube feedings may be administered on: Bolus; Intermittent; Cyclic or Continuous schedules.

1. ***Bolus Feedings***
   - Instillation of **liquid** nourishment 4-6 times a day in < 30 min **250 - 400 mL**
   - It **distends stomach rapidly**, causing **gastric discomfort** and increased risk of **reflux**.
   - It **mimics the natural filling** and **emptying** of stomach.
   - **Delayed gastric emptying** ➔ great risk for regurgitation, vomiting & aspiration.
2. ***Intermittent Feedings***
   - Gradual instillation of liquid nourishment 4-6 times a day over **30 - 60 minutes**.

- The usual volume is **250 to 400 mL**.
- Given by gravity drip or with a feeding pump.
- Gradual stomach filling at a slow rate **reduces bloated feeling**.
- The formula container requires cleaning after each feeding. Tube feeding administration sets are replaced every 24 hours.

3. ***Cyclic Feedings***

- Continuous nourishment instillation for 8 - 12 hours is followed by a 16-12 hour pause.
- Used to wean clients from tube feedings.
- It is given during the late evening and sleep.
- During the day, clients eat some food orally.
- As oral intake increases, the volume & duration of tube feeding gradually are decreased.

4. ***Continuous Feedings***

- A continuous feeding (instillation of liquid nutrition without interruption) is administered at a rate of approximately 1.5 mL/minute.
- A feeding pump is used to regulate the instillation.
- The formula can be delivered directly into the small intestine.
- It reduces the risk of vomiting and aspiration.
- Continuous feeding creates some inconvenience.

Client Assessment

The following daily assessments are standard for every client:

- Weight ▪Vomiting ▪Lung sounds ▪Temperature ▪Bowel sounds
- Gastric complaints ▪Abdominal distention ▪Fluid intake & output,
- Condition of the nasal and oral mucous membranes ▪Bowel elimination patterns
- Skin condition at the site of a transabdominal tube. ▪Breathing pattern,
- Assess the client's **gastric residual** (volume of liquid within stomach).

☒ **Overfilling** stomach can cause **gastric reflux**, **regurgitation**, **vomiting**, **aspiration** & **pneumonia**.

☒ The gastric residual should be **no more than 100 mL** or no more than **20% of the previous** hour's tube-feeding volume.

Nursing Management

Caring for clients with feeding tubes generally involves

1. Maintaining tube patency,
2. Clearing any obstructions,
3. Providing adequate hydration,
4. Dealing with common formula related problems,
5. Preparing clients for home care.

Maintaining Tube Patency

- Feeding tubes, especially smaller than 12 F, are prone to obstruction.
- **Flush feeding tubes with 30 to 60 mL** of water immediately before and after administering a feeding or medications,
- Common causes are using large-molecule formulas, refeeding partially digested gastric residual, administer formula at a rate 50 mL/hour & instilling crushed medications into tube.
- **Flush** every 4 hours if the client is being continuously fed & after refeeding gastric residual.

Clearing an Obstruction

- If an obstruction occurs, consults the physician.
- Clear the tube with a solution of meat tenderizer or pancreatic enzyme, but both methods require written medical orders.
- When an obstruction cannot be cleared, the another tube is inserted.

Providing Adequate Hydration

- Adults require 30 mL of water/kg, or 1 mL/kcal, on a daily basis.
- Identify the amount of water on the label of commercial formula.
- If there is a significant deficit, the nurse revises the plan of care to either increase the volume or, the frequency of flushing the tube.
- Monitor client's urine output and lung sounds.

Dealing with Miscellaneous Problems

Clients with enteral feeding experience several potential problems. Many are associated with tube-feeding formulas or the mechanical effects of the tubes.

Report problems and make necessary adjustments to the plan of care.

Preparing for Home Care

Before discharged, the nurse provides a written instruction sheet that includes

- Places to obtain equipment and formula
- Amount & schedule for each feeding & flush, using household measurements
- Guidelines for delaying a feeding
- Instructions for skin, nose, or stomal care including frequency & types of used product
- Problems to report such as weight loss, reduced urination, weakness, diarrhea, nausea and vomiting, and breathing difficulties
- Names and phone numbers of people to call if questions arise
- Date, time, and place for continued medical follow-up

INTESTINAL DECOMPRESSION

Clients require intestinal decompression, which is performed with a tungsten-weighted tube.

Tube Insertion

- A naso-intestinal decompression tube is inserted as a nasogastric tube.
- The nurse promotes and monitors its passage into the intestine.
- In the presence of peristalsis, the tungsten weight propels tube tip beyond stomach.
- Openings in distal end provide channels for intestinal contents to be suctioned.

Removal

- The tube is removed slowly because removal is in a reverse direction through the curves of the intestine and the valves of the lower and upper ends of the stomach.
- First, the **tube is disconnected** from the suction source.
- Next, the **tape that secures the tube to the face is removed** and the **tube is withdrawn** 6 to 10 inches (15 to 25 cm) **at 10-minute intervals**.
- When the last 18 inches (45 cm) remains, the **tube is pulled gently** from the nose.
- Afterward, **nasal and oral hygiene measures** are provided.

NURSING IMPLICATIONS

Depending on data collected during client care, the nurse may identify one or more of the following nursing diagnoses:

- Diarrhea
- Constipation
- Risk for Aspiration
- Impaired Swallowing
- Self-Care Deficit: Feeding
- Impaired Oral Mucous Membranes
- Imbalanced Nutrition: Less than Body Requirements