HIGH ALERT - Inadvertent placement in the trachea can lead to severe complications: pleural injury, pneumothorax, tracheobronchial aspiration, pneumonia, and death if fluids or other agents are infused (Walsh et al, 2016).

DEFINITIONS

Levine Tube: a one-lumen nasogastric/orogastric tube. It is usually made of plastic with several drainage holes near the gastric end of the tube. This nasogastric tube is useful in instilling material into the stomach.

Nasogastric (NG) tube: a tube that is passed through the nose and down through the nasopharynx and esophagus into the stomach

Orogastric (OG) tube: tube that is passed through the mouth and down through the oropharynx and esophagus into the stomach

Salem-sump: is a two-lumen nasogastric/orogastric tube. The dual lumen tube allows for safer continuous and intermittent gastric suctioning. The large lumen allows for easy suction of gastric contents, decompression, irrigation and medication delivery. The smaller vent lumen allows for atmospheric air to be drawn into the tube and equalizes the vacuum pressure in the stomach once the contents have been emptied. This prevents the suction eyelets from adhering to and damaging the stomach lining.

ROLES

Graduate Nurse (GN) and Graduate Licensed Practical Nurse (GLPN): GNs and GLPNs may insert, care for and remove nasogastric/orogastric tubes, according to physician orders, and under supervision of an RN or LPN until deemed competent to provide care autonomously.

Most Responsible Physician (MRP) or designate: MRPs will provide orders for the insertion, use and removal of nasogastric/orogastric tubes, x-ray if needed, and will document results of any x-ray confirmation of tube placement.
Registered Nurse (RN) and Licensed Practical Nurse (LPN): RNs and LPNs, including those LPNs who graduated prior to 2008 and have completed the SaskPolytechnic NG Completer Course, may insert, care for and remove nasogastric/orogastric tubes, according to physician orders.

1. PURPOSE

1.1 To minimize risk of aspiration and other complications associated with nasogastric/orogastric tube insertion and use.

1.2 To provide consistent best practice guidelines for management of a nasogastric/orogastric tube.

2. POLICY

2.1 Nasogastric/Orogastric tubes are used:

2.1.1 To remove fluid and gas from the gastrointestinal tract

2.1.2 To obtain a specimen of gastric contents

2.1.3 To treat gastric immobility and bowel obstructions

2.1.4 To allow for drainage and/or lavage in drug overdoses or poisonings

2.1.5 For short term medication administration and short term feeding

2.2 The Most Responsible Physician (MRP) or designate writes orders:

2.2.1 Written Order Required:

2.2.1.1 To insert, irrigate and/or remove a nasogastric (NG)/orogastric (OG) tube

2.2.1.2 For x-ray to confirm tube placement when unable to confirm tube placement with pH testing. Requisition MUST indicate reason for X-ray (i.e. Chest X-ray for confirmation of gastric tube placement). The MRP or designate may confirm placement based on a review of the x-ray. It is the responsibility of the MRP or designate to consult with radiology should there be any doubt with respect to placement

2.2.1.3 For the type and amount of suction

2.2.1.4 For gastric fluid replacements; should include route, solution type and additive, volume/rate and duration time for replacement

2.2.1.5 For short term feedings

2.2.1.6 NG/OG tube placed intraoperatively: The Surgeon has confirmed placement by direct visualization or palpation, an order will be written that confirmation of placement was done and tube may be used. An additional order may be written that pH testing is not needed, and placement will be checked by doing Clinical Assessment (see 2.3.2)
2.3 The correct gastric placement of NG/OG tubes will be confirmed:

2.3.1 By pH testing of aspirate, regardless of the purpose of the tube on insertion, as well as prior to instilling any feeding or medication. Exception: for a special circumstance where pH may not be reliable, an alternate method of checking placement may be used (i.e., patient on continuous feeds, or patients taking acid reducing medication). Refer to 3.2.5.1 to 3.2.5.3.

2.3.2 By Clinical Assessment: Which is done on tube insertion as well as prior to instilling any feed or medication, and placement must be checked minimally every shift by Clinical Assessment. The Clinical Assessment includes all of the following: Client is tolerating the NG/OG, the NG/OG is working properly (for suction or feeds), no coiling of tube in mouth, no unexplained respiratory distress, absence of unexplained cough, no drop in oxygen saturations if being monitored, absence of vomiting or retching, and insertion length of NG/OG has not changed.

2.3.3 By x-ray:

2.3.3.1 If unable to obtain aspirate (to test pH), or the pH is above the expected range - at the discretion of the MRP.

2.3.3.2 At the discretion of the physician when placement of NG is in doubt

2.3.4 By visualization or palpation for tubes placed intra-operatively by the surgeon

2.4 Special Considerations

2.4.1 A Nasogastric / Orogastric Tube will not be inserted if:

2.4.1.1 The patient has or is suspected to have a basal skull fracture or cribriform plate fracture - both NG/OG tubes

2.4.1.2 There is danger of perforation with patients who have had recent esophageal surgery/repair, esophageal varices, esophageal strictures, esophagectomy, recent gastric surgery, gastrectomy, recent throat surgery. Check with MRP prior to insertion - both NG/OG tubes

2.4.1.3 The patient has facial fractures or recent surgery to ear, nose, throat, or jaw. Check with MRP or ordering Physician prior to insertion - both NG/OG tubes

2.4.1.4 The patient has severe coagulopathies. It is recommended to check INR/PTT, hemoglobin and platelets prior to procedure - both NG/OG tubes

2.4.2 Large bore NG/OG tubes are not recommended for enteral feeding. Small bore feeding tubes should be used instead.

Please see the following policies:

- Enteral Feeding Tube with a Stylet: Assisting with Insertion of, Care of, Removal of - #1109
- Enteral Tube Feeding - Adult # 1020
- Enteral Tube Feeding - Pediatrics # 1026
3. PROCEDURE

3.1. Insertion

3.1.1 Consent and Patient Teaching

3.1.1.1 Obtain verbal consent from the patient or family and document in nursing progress notes

3.1.1.2 Documentation of verbal consent to include:

- Who consent was obtained from
- Explanation of procedure given
- Rationale and potential risks explained
- Teaching done with patient

3.1.2 Supplies:

- 14 or 16 Fr Levine or Salem Sump tube (smaller lumen catheters are not suitable for decompression because they are unable to remove thick secretions)
- Water soluble lubricating gel
- Appropriate PPE (must include gown, clean gloves, mask with attached visor, or N95 mask with face visor)
- Tongue depressor
- Flashlight
- Emesis basin
- Incontinent pad or towel
- Catheter tipped syringe 60 mL
- Fixation device
- Safety pin and rubber band (optional)
- Glass of water with straw or ice chips
- Facial tissues
- Wash cloth with soap and water
- Alcohol Swab
- Functioning Suction equipment
- Anti-Reflux Valve if needed
- Surgical tape and Instrument tape
- Skin barrier wipes
- pH indicator strips SKU # 204370

3.1.3 Perform hand hygiene and don appropriate PPE.

3.1.4 Provide privacy.

3.1.5 Place patient in high Fowler’s position (if no positioning restriction). Place pillows behind head and shoulders. Raise/lower bed to height that is comfortable for the nurse.

3.1.6 Place incontinent pad/towel over patient’s chest. Allow to blow nose if necessary. Place emesis basin within reach.

3.1.7 Wash bridge of nose with soap and water or alcohol swab.
3.1.8 Perform procedure from right side of patient if right-handed, left side if left-handed.

3.1.9 Instruct patient to relax and breathe normally while occluding one nares. Then repeat this action for the other nares. Select nostril with greater air flow.

3.1.10 Measure distance to insert tube.

3.1.11 Measure distance from tip of nose to earlobe then to xiphoid process (For oral insertion measure from lips to earlobe to xiphoid)

3.1.12 Mark tube by wrapping a small piece of tape around NG/OG tube as temporary marker for length of insertion.

3.1.13 Curve 10 to 15 cm (4-6 inches) of end of tube tightly around index finger, then release.

3.1.14 Lubricate 7.5 to 10 cm (3-4 inches) of end of tube with water-soluble lubricating gel.

3.1.15 Instruct patient to extend neck back against pillow. Insert the tube gently and slowly through nare with curved end pointing downward.

3.1.16 Continue to pass tube along floor of nasal passage aiming down toward patient’s ear. If you feel resistance apply gentle downward pressure to advance the tube (do not force past resistance).

**Note:** Oral insertion: Direct tube to the back of the tongue and then direct tube downwards through the oropharynx.

3.1.17 If you meet continued resistance, try to rotate the tube, and see if it advances. If still resistant, withdraw tube, allow patient to rest, lubricate tube again and insert into other nare.

3.1.18 Continue insertion of the tube until just past nasopharynx by gently rotating tube towards opposite nares.

3.1.19 Once past nasopharynx, stop tube advancement, allow patient to relax and provide tissue.

3.1.20 Explain to the patient that they will need to swallow to assist with tube advancement. Provide the glass of water with straw.
Note: If potential for aspiration a few ice chips on a spoon may be offered or the patient can be asked to dry swallow.

3.1.21 With the tube just above the oropharynx, instruct the patient to flex head forward, take a small sip of water and swallow. Advance the tube 2.5-5 cm (1-2 inches) with each swallow. The same can be done with a dry swallow.

3.1.22 If the patient begins to cough, gag, or choke - withdraw tube slightly and stop advancement to allow patient to relax, breathe and take small sips of water.

Note: If the patient does not have an intact gag and/or swallow reflex this will not occur.

3.1.23 After the patient relaxes attempt advancing the tube again. If the patient continues to cough and gag, check for coiling of the tube at the back of the throat using a tongue blade and flashlight. If coiled withdraw the tube until it is up in the oropharynx again.

3.1.24 After the patient relaxes attempt advancement with the patient swallowing until the tape mark is reached.

3.1.25 Temporarily anchor to the nose or the cheek until tube placement confirmed. Can apply tube fixation device. May apply skin barrier to aid adhesion.

3.1.26 Special Considerations regarding insertion

- If the patient has an endotracheal tube, the cuff remains inflated during insertion.
- If the patient has a cuffed tracheostomy tube, the cuff should be inflated during insertion.
- The patient without a gag or swallow reflex should not be given water to swallow. Instead have the patient dry swallow.
- The patient with decreased level of consciousness is heavily sedated, unable to communicate, or lacking a gag reflex has potential for inadvertent respiratory placement. If there is any question regarding placement, a physician must be consulted for a second opinion regarding NG/OG tube placement.
- The unconscious patient is positioned with head down preferably in a left side lying position for insertion. If there is any question regarding placement, a physician will be consulted for a second opinion regarding NG/OG Placement in a unconscious patient.
- Exercise caution when inserting NG in the patient with suspected cervical spine injury. Stabilization of the head is required to avoid excessive manipulation or movement.
- If local anesthetic is required or ordered by the physician to assist with ease of insertion, the physician is required to apply. Do not give water to swallow. Patient should dry swallow.
- Infection Control. Potential for contact with a patient’s blood/body fluids. Use of gloves, face and eye protection is mandatory.

3.2 Confirm Correct Placement of NG/OG Tube - Includes initial placement and prior to instilling feeding or medication. (See Appendix A)

3.2.1 NG/OG placement check: (includes all of the following)

3.2.2 Asking patient to speak (if able to).
3.2.3 Inspecting back of throat for coiling of tube.

3.2.4 Attach 60 mL catheter tip syringe to end of tube and aspirate gently back to obtain gastric contents.

3.2.5 Test pH of aspirate. Place .5 to 1 ml of gastric aspirate on pH indicator strip. Follow manufacturer’s directions as to wait time. A pH of 5.5 or below indicates correct placement in most patients. Call MRP prior to use if pH greater than 5.5, considering the following information:

**3.2.5.1 Patients taking acid reducing drugs** may have an altered pH. Notify MRP on 1st pH testing for further direction regarding ongoing management of this patient. The MRP may order no further pH testing to check tube placement (because of expected changes in pH with acid reducing medication). The NG/OG placement must be monitored at least once a shift using the Clinical Assessment (see 2.3.2). The Clinical Assessment includes: Patient tolerating the tube, no coiling of tube in mouth, no unexplained respiratory distress, absence of coughing, no drop in oxygen saturation if being monitored, absence of vomiting and retching, and insertion length of NG/OG has not changed.

**3.2.5.2 Patients with NG/OG only being used for decompression (attached to suction)** For patients with NG/OG tubes used only for decompression, the initial NG/OG placement will be checked by pH as well as other NG/OG tube assessments. The NG/OG placement must be monitored at least once a shift using the Clinical Assessment (see 2.3.2): The Clinical Assessment includes: Patient tolerating the tube, the NG/OG is working properly, no coiling of tube in mouth, no unexplained respiratory distress, absence of coughing, no drop in oxygen saturations if being monitored, absence of vomiting or retching, and insertion length of NG/OG has not changed. If there are concerns, MRP should be contacted. If giving a medication or feeding, pH must be tested prior to each administration.

**3.2.5.3 When the patient on a continuous short term feed**, the continuous feed will affect the pH measurement. Therefore the NG/OG tube placement must be monitored at least once a shift using the Clinical Assessment (see 2.3.2). The Clinical Assessment includes: Patient is tolerating the feedings, no coiling of tube in mouth, no unexplained respiratory distress, absence of coughing, no drop in oxygen saturation if being monitored, absence of vomiting or retching, and insertion length of NG/OG has not changed.

3.2.6 Check color of aspirate. Gastric fluid is usually grassy green, while intestinal fluid tends to be golden or translucent. Pleural fluid is typically off white or pale yellow.
3.2.7 **X-ray may be ordered to confirm placement. Refer to 2.2.1.2.**

3.2.8 Measure and document length of tube from nares/lip to where NG/OG tube meets the connector. If the NG/OG has marked measurements then these can be documented for reference. Instrument tape/water proof tape may be used to mark the level of the insertion on the NG/OG tube without markings. See Appendix B.

3.2.9 Nursing judgement of proper NG/OG placement is based on results of patient’s Clinical Assessment (e.g., patient is tolerating tube, no unexplained respiratory distress, absence of coughing, no drop in oxygen saturation if being monitored, absence of vomiting or retching), insertion length has not changed, and pH measurement within range is used to determine placement. If any of assessment is questionable, consult MRP.

3.3 **If x-ray is ordered to confirm placement by MRP**

  **Note:** NG/OG tube must be anchored prior to x-ray

3.3.1 Complete order for x-ray to confirm NG tube placement on tubes that are being used for decompression, medication administration or feeding. Requisition MUST indicate reason for x-ray i.e. ‘Chest x-ray or abdominal x-ray for confirmation of gastric tube placement.’ Requisition must include the ordering Physician’s name.

3.3.2 Notify MRP or designated Physician when x-ray is competed.

3.3.3 MRP or designate confirms placement: It is the responsibility of the MRP or designate to consult with radiology should there be any doubt with respect to placement. If X-ray to confirm placement, the Practitioner Order MUST be written stating “Tube placement verified by x-ray and may be used.”

3.4 **Anchoring Tube**

3.4.1 Apply tube fixation device to nose and to tube (most common method) or apply prepared tape to nose leaving split end free. Wrap two split ends of tape around tube.

3.4.2 Apply marking tape (instrument tape/water proof tape) on tube to indicate where tube exits nose/mouth. Measure and document length of tube from nares/lip to connector. If the Salem sump has marked measurements then these markings can be documented for reference.

3.4.3 Once anchored and placement confirmed, clamp end of tube or connect to drainage bag or suction as ordered.

3.4.4 Apply Anti-Reflux Valve to the end of the venting lumen of Salem-sump to prevent spillage or siphoning of gastric fluid into it (blue to blue end). If any gastric fluid is present in this lumen then using a catheter tip syringe inject 10 mL of air into it to clear prior to attaching the anti-reflux valve.

3.5 **Care of**

3.5.1 Nurse patient with head of bed elevated to 30 degrees unless otherwise ordered.

3.5.2 Using a safety pin and tape, secure tube to patient’s gown.
3.5.3 Assess for coiling of the tube if patient presents with gagging, coughing, and vomiting. (Check the back of throat using a tongue depressor and flashlight).

3.5.4 Check NG/OG tube placement at least once a shift, and prior to instilling any medication or feeding for all of the following:

3.5.4.1 Asking patient to speak (if able to)

3.5.4.2 Inspecting back of throat for coiling of tube.

3.5.4.3 Check the tube anchoring device and the insertion marking (either increment markings on tube or tape marking insertion level) with documented insertion length. If length if different but able to withdraw gastric secretions, and pH testing is 5.5 or less, document new length in chart

3.5.4.4 Attach 60 mL catheter tip syringe to end of tube and aspirate gently back to obtain .5 to 1 mls of gastric contents. If unable to withdraw gastric secretions, try the following:

- If the length of insertion is less than previously documented, may advance the NG/OG tube 2.5 to 5.0 cms and attempt to aspirate secretions.
- If possible, reposition patient onto side and instill 10 to 20 mls of air into the NG/OG. Wait 15 to 30 minutes and attempt to aspirate gastric secretions again.
- If still unable to obtain gastric secretions, do not use and notify MRP.

3.5.4.5 Test pH of aspirate. Place .5 to 1 ml of gastric aspirate on pH indicator strip follow manufacturer's directions as to wait time. A pH of 5.5 or less indicates correct placement in most patients. Call MRP prior to use if pH greater than 5.5. X-ray may be ordered to confirm placement. pH testing for gastric placement should take place:

- Following insertion
- Before the administration of each bolus of feed or fluid
- Before commencing a new cycle of feed or fluid
- Before each medication given through tube, if feed is not in progress
- Following episodes of vomiting, retching or coughing
- Where there is evidence of tube displacement e.g. Insertion length of tube at the nostril or mouth is less/more than previously documented, or securement device has loosened
- If there is any new or unexplained respiratory symptoms or reduction in oxygen saturation

Note: Refer to 3.2.5.1 to 3.2.5.2 for placement checks for those patients with NG/OG only being used for decompression, those patient on acid-reducing medication and those patients receiving continuous feed through NG/OG
3.5.5 Perform mouth care q1-2h to prevent damage to the oral mucosa while tube in place since mouth breathing is common in patients who have a nasal tube present.

3.5.6 Perform nose care each shift and pm for NG tube placement

3.5.7 Re-secure the tube to patient’s nose and/or mouth as necessary, maintaining position of tube as marked.

3.5.8 Observe drainage contents and record drainage volumes every shift or as ordered.

3.5.9 Auscultate for bowel sounds q shift or as ordered. (Turn off suction while auscultating).

3.5.10 Report to the physician

3.5.10.1 A sudden increase or decrease in output of drainage

3.5.10.2 The presence of “coffee ground” or frank blood

3.5.10.3 An abnormal pH

3.5.10.4 Large volume losses as can lead to electrolyte imbalances and hypovolemia, both of which may require IV fluid replacement

3.5.10.5 Unable to verify placement with pH.

3.6 **Irrigation of NG/OG Tube (if ordered)**

3.6.1 Supplies:

- Appropriate PPE – clean gloves and mask with attached visor
- 2-60 mL catheter tip syringes and container for irrigating solution
- Normal saline for irrigation
- Disposable pad or bath towel
- Clamp

3.6.2 Perform hand hygiene and put on appropriate PPE.

3.6.3 Check for tube placement in the stomach. Refer to 2.3 and 3.2

3.6.4 Draw up 30 mL of normal saline into catheter tip syringe.

3.6.5 Clamp tube. Disconnect connecting tubing and lay connecting tubing on disposable pad or towel.

3.6.6 Insert tip of syringe in tube. Remove clamp. Hold syringe upright tip pointed at floor and gently and slowly inject saline. Do not force solution into tube.

3.6.7 If resistance occurs, check for kinks in the tubing. Turn patient onto left side and attempt again. If repeated resistance report to physician.
3.6.8 Following instillation, gently aspirate or pull back slowly on syringe to withdraw fluid. If amount aspirated is greater than amount instilled, record difference as output. If amount aspirated is less than amount instilled then record difference as intake.

3.6.9 If using a Salem Sump, you may need to use a catheter tip syringe and inject 10 mL of air into the smaller lumen (venting lumen) to keep clear.

3.6.10 Reconnect tube to drainage or suction. Repeat irrigation if solution does not return.

3.6.11 Remove and discard gloves and perform hand hygiene.

3.6.12 Report to the physician the inability to irrigate the tube.

3.7 Removal of NG/OG Tube

3.7.1 Explain procedure to patient and reassure that the removal is less distressing than insertion.

3.7.2 Perform hand hygiene and apply clean gloves, mask with attached shield and/or appropriate PPE

3.7.3 Turn off suction and disconnect tube from drainage bag or suction. Inject 20 mL of air into lumen of tube.

3.7.4 Remove tape or fixation device from nose and unpin tube from gown.

3.7.5 Stand on patient’s right side if right handed, left side if left handed.

3.7.6 Provide patient with tissue, place incontinent pad or towel across patient chest.

3.7.7 Instruct patient to take a deep breath and hold it.

3.7.8 Clamp or kink tube securely and then pull tube out steadily and smoothly into pad while patient holds breath.

3.7.9 Inspect intactness of tube then discard into appropriate garbage.

3.7.10 Clean nares and provide mouth care.

3.7.11 Measure and record amount of drainage on appropriate fluid balance record.

3.8 Documentation (Chart on the appropriate nursing record)

3.8.1 Date and time of nasogastric/orogastric tube insertion and size of tube used.

3.8.2 External tube measurement for confirmation of tube placement.

3.8.3 Confirmation of tube placement prior to administration of feeding or medication via NG/OG tube and if tube is only being used for decompression, confirmation is checked at least once a shift.

3.8.4 pH reading

3.8.5 Date and time of tube irrigation.
3.8.6 Date and time of tube removal.

3.8.7 Name of person performing the procedure(s).

3.8.7 Tolerance of procedure(s).

3.8.8 Attachment to suction, straight drainage, tube feed or if clamped.

3.8.9 Irrigation, drainage amounts, replacement fluid amounts on appropriate fluid balance record.

**NOTE:** For administration of tube feed see: Enteral Tube Feeding Policy #1020

4. REFERENCES

Best, C. How to insert a NG tube and check gastric position at the bedside. Nursing Standard. 2016; 30 (38): 36-40


Evolve resources for Perry, Potter & Ostendorf: Clinical Nursing Skills and Techniques, 8th Edition 2014


Appendix A

Confirming Nasogastric/Orogastric Tube Placement in Adults prior to Instilling Feedings or Medication

1. Check if on acid reducing medication
2. Check for signs of tube displacement and measure tube length
3. Reposition or repass tube if required
4. Aspirate using 60 ml syringe and gentle suction

Aspirate not obtained

DO NOT FEED
1. If tube length is less than documented on insertion
2. Advance Tube 2.5 to 5.0 cm
3. Try to aspirate again
4. Do not reposition GI Surgery NG's, contact MRP

Aspirate obtained (0.5-1ml)

DO NOT FEED
1. If possible, turn adult onto side
2. Inject 10-20 ml air into the tube using syringe
3. Wait for 15-30 minutes
4. Try aspirating again

Aspirate obtained (0.5-1ml)

Aspirate not obtained

Test on pH strip or paper

pH greater than 5.5

DO NOT FEED
1. Leave for up to one hour
2. try aspirating again

pH 5.5 or less

pH greater than 5.5

DO NOT FEED
1. Notify MRP or designate
2. MRP may consider x-ray or replacement

pH 5.5 or less

Proceed to feed

Adapted from National Nurses Nutrition Group: www.spsa.nhs.uk/advice
Diagram of NG/OG tube and Connector Placement

Information Regarding Ordering of Instrument Tape

1. Through SPH Stores: Vendor: Cardinal Health Canada Inc. VPC is HS7196 - RL $41.73

2. Through RUH Stores: Vendor: Schaan Healthcare: $12.95 a roll