Guideline

Nasogastric and Orogastric Tube Insertion and Management in Neonates, Infants and Children

Summary This Guideline is intended to guide health professionals within healthcare facilities on the minimum requirements for insertion, correct placement and safe management of gastric tubes for neonates, infants and children.

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Author branch Agency for Clinical Innovation

Branch contact (02) 9464 4666

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Audience Clinical;Medical;Nursing Staff;Emergency Department;Paediatric wards;Special Care Nursery;Neonatal intensive care units;Paediatric intensive care units

Secretary, NSW Health

NSW Health

Guideline

Nasogastric and Orogastric Tube Insertion and Management in Neonates, Infants and Children

Guideline Summary

This Guideline provides direction to clinicians who are responsible for the insertion and/or management of gastric tubes, such as nasogastric or orogastric tubes, in neonates, infants and children. Clinicians performing the insertion and management are expected to be appropriately trained, or under appropriate supervision, to perform the procedure.

The Guideline covers strategies for each stage of tube insertion and management, including pre-insertion of the tube, insertion of the tube, confirmation of placement of the tube (both radiologically and non-radiologically), tube care and maintenance, and removal of the tube. It also provides guidance on health record documentation requirements, and incident reporting.

The insertion and management of transpyloric/nasojejunal tubes, and the insertion and management of nasogastric and orogastric tubes in adults are out of scope of this Guideline. For adults, please refer to NSW Health Guideline *Insertion and Management of Nasogastric and Orogastric Tubes in Adults* (GL2023_001).

Key Principles

Implementation and governance

NSW Health organisations are responsible for the implementation of this Guideline within their services/facilities and ensuring local protocols or operating procedures are in place and consistent with this Guideline. This includes providing education and training where it is required to improve skill and competency and establishing a process for monitoring practice.

A treating medical officer/nurse practitioner must order the insertion of a gastric tube and document in the health record, including the reason the gastric tube is needed. Standing orders or clinical pathways may be developed by Local Health Districts and Specialty Health Networks for the management of specific conditions and circumstances.

Decision making must consider the indications for use of a gastric tube, and the complexity of the presenting clinical condition. In emergency departments, nursing staff may insert a gastric tube during initial emergency care under the appropriate Emergency Care Assessment and Treatment (ECAT) Protocol, and within their scope of practice. Gastric tube insertion or replacement in high-risk clinical conditions requires review by the senior medical officer responsible for the patient's care.

Gastric tube insertion and verification

Gastric tube insertion is a common procedure performed in a ward environment by a nurse or medical officer. Where experience is limited, the insertion should be supported by a more experienced clinician.

Orogastric tube insertion is common in neonates and infants, however, in an older child or adolescent it is a more specialised procedure. The insertion must be completed by, or under the supervision of, a clinician experienced in orogastric tube insertion. As this procedure may require use of a laryngoscope, insertion may be completed at the time of intubation, and usually in a critical care setting.

There are risks associated with incorrect gastric tube insertion. This risk could include death. Use of an incorrectly positioned gastric tube resulting in serious harm or death is classified as an Australian Sentinel Event. The patient should be monitored for early warning signs of deterioration and if recognised the local clinical emergency response system (CERS) must be initiated.

Before a gastric tube can be used for any enteric intake (feeding formula, medication or fluids), confirmation of correct tube placement must be actioned and documented in the medical record. Confirmation of tube placement can be done via pH testing of aspirates or radiologically (via chest X-ray).

Confirmation and ongoing care

pH testing can be performed in instances such as prior to administration of medications or enteral feeds. It requires attainment of an aspirate via the tube and testing of the pH level on pH indicator strips with clear gradation markings (Litmus paper **must not** be used).

Radiological confirmation must be ordered by a medical officer to confirm safe placement of a tube if:

- there was difficulty experienced when inserting the tube
- the patient had a clinical presentation which may have increased the risk of tube misplacement during the insertion
- there is any concern about potential tube misplacement
- an aspirate cannot be obtained
- the pH testing of the aspirate is greater than 5.0.

Radiological confirmation requires that the chest X-ray is reported by a radiologist, or reviewed by an experienced medical officer, who can exclude insertion complications and can confirm the anatomical position of the tip of the tube below the diaphragm and in the stomach.

Tube care and maintenance is important to maintain effectiveness of the tube and prevent the need for removal and replacement. It involves monitoring for tube migration, monitoring tube condition and patient skin integrity, maintenance of tube patency and safe and appropriate management of tube blockages.

The ongoing care and maintenance of orogastric tubes is similar to a nasogastric tube with differences in management in tube measurement guidance and securement, and dislodgement and reinsertion protocols.

Revision History

Version	Approved By	Amendment Notes
GL2025_015 October-2025	Deputy Secretary, System Sustainability and Performance	Updated clinical decision pathway in Appendix 2.
GL2025_012 July-2025	Deputy Secretary, Clinical Innovation and Research	• Neonates included. Guideline now applies from birth to 16 years. • Medical order requirement from medical officer or nurse practitioner documenting indication now required. • Updated tube size recommendations. Revised guidance based on age and clinical need.
IB2024_043 August-2024	Chief Executive, Agency for Clinical Innovation	
GL2016_006 Febrruary-2016	Deputy Secretary, Strategy and Resources	Guideline revised following identified errors in the text and format following publication.
GL2016_003 January-2016	Deputy Secretary, Strategy and Resources	New guideline.

Contents

1. Background

1.1. About this document

This Guideline provides health professionals in healthcare facilities with the minimum requirements for insertion, correct placement, and safe management of nasogastric (NGT) and orogastric (OGT) tubes for neonates, infants, and children. The term ‘gastric tube’ used in this Guideline pertains to orally or nasally inserted gastric tubes.

Each patient is to be individually assessed, and a decision made regarding appropriate management to achieve the best clinical outcome. Incorrectly placed gastric tubes can be associated with significant morbidity and potential mortality (Australian Sentinel Event).

Gastric tube insertion is an invasive procedure and may cause patient and/or parent/carer distress. Clinicians are to use a trauma-informed approach and be aware that a child’s development, cultural background, and level of health literacy may impact a patient and family's ability or willingness to communicate distress.

Clinical staff involved in caring for neonates, infants, and children are required to be knowledgeable in the safe insertion and management of gastric tubes. Each NSW Health service will determine appropriate education pathways to ensure clinicians are able to confirm correct placement as well as provide safe care and management of gastric tubes for neonates, infants and children.

1.2. Scope

This Guideline is for use with pre-term neonates through to children up to and including 16 years old.

The principles of gastric tube management remain the same in any care setting, however, those being managed in the community by a primary health care team require a gastric tube management plan.

This Guideline:

- does not cover the management of enteral nutrition
- does not apply to transpyloric/nasojejunal tube insertion and/or management in neonates, infants and children.

NSW Health organisations are responsible for the implementation of this Guideline within their services and facilities, and for ensuring local protocols or operating procedures are in place and consistent with this Guideline. This includes providing education and training where required to improve skill and competency, and establishing a process for monitoring practice and reviewing any adverse events.

1.3. Key definitions

Aspirate	The withdrawal of fluid or gas from the gastric tube.
Australian Sentinel Event	Australian Sentinel Events are a subset of adverse patient safety events that are wholly preventable and result in serious harm to, or death of, a patient. They are the most serious incidents reported through the state and territory incident reporting system.
Child	12 months – 16 years.
Child Safe Standards	The *Children's Guardian Act 2019* (NSW) focuses on ensuring the safety and wellbeing of children in various settings. Its main purpose is to protect children by providing for the role and functions of the Children's Guardian, including promoting the quality of services and regulating organisations involved in child safety. There are 10 standards (Child Safe Standards) that help guide child safe practices in organisations in NSW.
Decompression	The relief of pressure caused by fluid and gases that remain in the stomach.
ENFit	A global patient safety initiative, designed to ensure that enteral feeding tube connectors are incompatible with the connectors for unrelated delivery systems, such as tracheostomy tubes, intravenous lines, and catheters. The enteral feeding device connector design complies with the International Standard ISO 80369-3. ENFit is not compatible with Nutrisafe without adaptors converting Nutrisafe male connectors to ENFit female connectors, ensuring compatibility with various feeding and medical systems.
Enteral feeding	Method of giving the patient fluids and nutrients via a tube directly into the gastrointestinal tract.
Fr	French unit in relation to tube sizing. Tubes are measured in French units (Fr) where 1 French unit equates to an external tube diameter of 0.33mm.
Gastric aspirate	The withdrawal of fluid from the gastric tube which is tested using a pH test to confirm its origin in the stomach.

Gastric Tube	Can be either an orally or nasally inserted tube terminating in the stomach. Must be radio-opaque.
Infant	1 month – 12 months.
Medical Device Related Pressure Injury (MDRPI)	A localised injury to the skin or underlying tissue resulting from sustained pressure caused by a medical device, such as tubing and straps.
Migration	The tube position at the nose or gum has changed.
Nasogastric tube (NGT)	A tube that is passed via the nose and down through the nasopharynx and oesophagus into the stomach.
NEMU	An abbreviation of the measurement process from Nose-Ear-Mid-Umbilicus.
Neonate	A term infant 0-28 days (up to 44 weeks corrected gestational age).
Nutrisafe	Enteral feeding syringe specially designed for neonatal patients. Nutrisafe is a unique safe enteral feeding system incompatible with Luer and other small-bore connectors following the International Standard ISO 80369-1. Nutrisafe syringes can only be used with Nutrisafe feeding tubes or with any device featuring a male Nutrisafe connection.
Orogastric tube (OGT)	A tube that is passed through the mouth and down through the oesophagus into the stomach.
pH	Quantitative measure of the acidity or alkalinity of liquid, measuring the hydrogen ion concentration.
pH indicator strips	A pH measurement product that changes colour according to pH. Finer colour gradations with 0.5 increments improve accuracy. Must be certified for medical device regulation for use with human gastric fluids.
Polyurethane tube	Polyurethrane tubes are longer-term, designed to remain in situ for weeks or months, depending on manufacturer instructions for specific product used.
Pre-term neonate	A baby delivered before 37 weeks of gestation that may require specialist care in neonatal services.

PVC tube	PolyVinylChloride (PVC) is tubes are designed for short-term use, such as short-term feeding, resuscitation, or gastric decompression. Dwell time is generally in days and will depend on manufacturer instructions for the specific product used.
Senior Medical Officer (SMO)	Refers to a medical officer employed as a Staff Specialist or Visiting Medical Officer.
Transpyloric tube or naso-jejunal tube	A tube passed via the nose, down the back of the throat, through the oesophagus, stomach, and pyloric sphincter into the jejunum (small intestine).
Xiphoid process	The cartilaginous section at the lower end of the sternum, which is not attached to any ribs.

2. Meeting the needs of priority populations

Providing and enabling access to consistent, integrated, and continuous care is important for all families and carers, especially for marginalised groups (including young families and carers under 18 who fall under the scope of the Child Safe Standards). To communicate effectively with families and carers, it is important to understand the context and needs of the communities you are working with, including priority and vulnerable groups.

2.1. Care of Aboriginal and/or Torres Strait Islander families

It is recommended that all clinicians:

- Build strong relationships and work in partnership with Aboriginal patients and families to support their engagement with services and share their health history and concerns.
- Provide culturally safe care and understand that some Aboriginal people continue to have mistrust in health services due to the ongoing impacts of colonisation and intergenerational trauma.
- Ensure that Aboriginal families are offered a referral to appropriate services, such as Aboriginal Health Workers and/or Aboriginal Liaison Officers to support collaborative care and ensure cultural support is available.

2.2. Care of patients with an intellectual and/or physical disability

It is recommended that all care providers:

- promote dignity, autonomy, and inclusion, ensuring that care is respectful, non-discriminatory, and tailored to the child's developmental and functional abilities.
- engage with the child and their family or carers to understand their individual strengths, needs, and preferences.

- use communication aids or alternative communication methods (e.g., visual supports, simplified language, assistive technology) to ensure the child and their carers can understand and participate in care.

2.3. Care of Culturally and Linguistically Diverse families

It is recommended that all care providers:

- Use interpreter services for all families and carers where English is not their first language.
- Provide written information in the preferred language of the family or carer (where available).
- Use additional services, such as multicultural liaison officers, to support and inform families.

2.4. Refugees and asylum seekers

It is recommended that all care providers:

- Recognise the impact of past trauma, displacement, and uncertainty on the health and wellbeing of refugee and asylum seeker children and their families, and approach care with sensitivity and compassion.
- Respect cultural and religious practices and be aware of the potential stigma or fear associated with accessing health services due to past experiences.
- Collaborate with refugee health services, community organisations, and settlement support programs to ensure coordinated and continuous care.

2.5. Care of LGBTIQ+ people

It is recommended that all care providers:

- Create an environment where the person can share what language best describes themselves, their health care experiences and needs, relationships and family or support network.
- Use appropriate pronouns, language and terminology about bodies, sexuality, gender, and intersex variations as this supports recognition, trust, and safety.

3. Insertion and management of gastric tubes

3.1. Indications

Nasogastric tubes are used for:

- Nutrition, hydration support and medication administration.
- Gastric decompression and/or drainage of the upper gastrointestinal tract.
- Surgical splinting post oesophageal surgery.

3.1.1. Gastric drainage/decompression

If the purpose of the tube is decompression or drainage, the use of a larger size short-term tube with radio-opaque marker is appropriate. If the patient requires enteral feeding, the tube should be changed to one with a smaller lumen size as soon as practical to reduce the risk of Medical Device Related Pressure Injury (MDPRI) and for patient comfort.

When a patient has excessive gas or fluid in their stomach (due to conditions like bowel obstruction, ileus, or gastric distension), an NGT can help alleviate discomfort by draining these contents. Manual aspiration may be necessary.

3.2. Precautions

Nasogastric tube insertions are to be performed by a clinician trained in inserting a gastric tube according to the principles of this Guideline and any relevant local policy or procedure. The clinician must seek support from experienced staff for assistance if required. In the case of patient/parent/carer concerns or complications, clinicians must follow escalation pathways as per local Clinical Emergency Response System (CERS) protocols.

Orogastric tube insertion is common in neonates and infants, however, in an older child or adolescent it is a more specialised procedure. The insertion must be completed by, or under the supervision of, a clinician experienced in orogastric tube insertion. As this procedure may require use of a laryngoscope, insertion may be completed at the time of intubation, and usually in a critical care setting.

3.2.1. Special conditions requiring review by a senior medical officer

Gastric tube insertion or replacement under the following conditions must not be performed without consultation with the senior medical officer (SMO) responsible for the patient's care.

The SMO must:

- Assess and document specific risks and considerations.
- Authorise the method of insertion and the clinician responsible (e.g., radiologist under radiological guidance, anaesthetist or delegate under direct vision, surgeon or delegate, experienced nurse).

High-risk clinical conditions requiring SMO review:

- Postoperative period following surgery to the mouth, pharynx, oesophagus, or stomach.
- Known structural abnormalities (e.g., choanal atresia).
- Recent caustic ingestion.
- Suspected inhaled or ingested foreign body.
- Suspected spinal cord injury.
- Known or suspected oesophageal varices, chronic liver disease, or liver failure.
- Upper gastrointestinal or oesophageal stricture.

- Oesophageal obstruction (e.g., neoplasm or foreign object).
- Suspected trauma to the nasal, maxillary, oropharyngeal, or oesophageal regions.
- Suspected base of skull fractures.
- Bleeding disorders or current/recent use of anticoagulants.
- Haematology and oncology patients.
- Recent head and neck radiation therapy.
- Facial and/or airway burns.
- Presence of an artificial airway (e.g., tracheostomy).

Special considerations

Insertion of a gastric tube in neonates, infants, or children carries a higher risk of misplacement in the following situations:

- Altered level of consciousness.
- Diminished or absent gag reflex and/or impaired swallow.
- Existing endotracheal or tracheostomy airway (especially with uncuffed tracheostomy).
- History of tracheo-oesophageal fistula repair, hiatal hernia repair, or abnormal GI anatomy. In such cases, blind reinsertion should be avoided, endoscopic placement may be considered. Gastric tube placement must be discussed with the surgical team in the immediate postoperative period (e.g., within 1–2 weeks). [3]

Additional risk factors:

- Long-term continuous enteral nutrition.
- Use of acid pump inhibitors.

These patients are at increased risk of adverse events during gastric tube insertion, particularly at initial placement. A documented risk management plan must be developed by the SMO prior to proceeding.

3.3. Risks associated with incorrect insertion and placement

Gastric tube misplacement can result in adverse patient outcomes, including severe morbidity and mortality. The following risks can be associated with the incorrect insertion and placement of gastric tubes:

- Aspiration and/or pneumonitis from gastric feeds and/or medication being administered into the lungs.
- Spontaneous passage through pylorus, causing feeding intolerance, abdominal pain, poor absorption of medications and diarrhoea.
- Trauma to surrounding tissues and lung/airway trauma.
- Perforation of the oesophagus.

- Pneumothorax.
- Haemorrhage.
- Intracranial insertion in infant/child with base of skull disruption or fracture.

3.4. Pre-insertion requirements

The following principles must be followed for every gastric tube insertion:

- infection control (see NSW Health Policy Directive *Infection Prevention and Control in Healthcare Settings* [PD2023_025])
- clinical documentation (see NSW Health Policy Directive *Health Care Records - Documentation and Management* [PD2012_069])
- use of a procedural safety checklist (see NSW Health Policy Directive *Clinical Procedure Safety* [PD2025_006])
- partnership with patients and parents/carers in accordance with the Child Safe Standards, including Standard 2 (Children participate in decisions affecting them and are taken seriously) and Standard 3 (Families and communities are informed and involved)
- informed consent (see NSW Health Policy and Procedure Manual *Consent to Medical and Healthcare Treatment Manual*
- trauma-informed practice (see the NSW Health *Integrated-Trauma Informed Care Framework: My story, my health, my future*).
- appropriate implementation of non-pharmacological techniques with consideration of the need analgesia and/or sedation (see The Royal Children's Hospital Melbourne webpage, Acute pain management).

3.4.1. Order and documentation

A treating medical officer/nurse practitioner must document in the health record the indication for NGT or OGT insertion. Standing orders or clinical pathways may be developed by Local Health Districts (LHDs) and Specialty Health Networks (SHNs) for the management of specific conditions and circumstances.

3.4.2. Emergency department protocol

In emergency departments, nursing staff may insert a gastric tube during initial emergency care under the appropriate Emergency Care and Assessment and Treatment (ECAT) paediatric protocol *Gastric tube or nasogastric tube replacement* [see NSW Health Policy Directive *The Use of the Emergency Care Assessment and Treatment (ECAT) Protocols* (PD2025_025)], and within their shaded scope of practice.

3.4.3. After-hours protocol

▲ **Red Flag**: Routine and non-acute gastric tube insertion should NOT occur after-hours. If gastric tube placement is required after-hours, escalate to the treating medical team as per local pathways.

Strict adherence to insertion verification processes is necessary. Independent verification and confirmation of gastric tube placement must be undertaken. Some areas, such as the neonatal intensive care may be exempt from this. Follow local guidelines.

3.4.4. Procedure preparation

Refer to the relevant section in the NSW Health Policy Directive *Clinical Procedure Safety* (PD2025_006). Gastric tube insertion is a Level 1 procedure.

Care must be provided following the Child Safe Standards, and this includes empowering children to participate in discussions about their care and decisions that affect them.

Prepare the child and parent/carer for the procedure with clear and age-appropriate communication. Minimise anticipatory anxiety by preparing all equipment before commencing a brief and honest explanation to the child and carer immediately before the procedure.

3.4.5. Nasogastric tube reinsertion

If there is, or previously has been, an NGT insitu, the alternate nostril should be used for reinsertion if possible or appropriate.

The procedure should, where possible, take place in a treatment/procedure room. This is to preserve the child's bedspace as a safe environment, free from painful or unpleasant procedures.

3.4.6. Managing patient anxiety and distress

Gastric tube insertion can be uncomfortable, causing anxiety and distress. Where appropriate, use distraction techniques, such as bubbles, action toys, books, smart devices, or video guided imagery for older children (see the Sydney Children's Hospitals Network Practice Guideline *Child Life Therapy: Procedure Support*). Some services may have designated Child Life Therapists to assist.

Where developmentally and medically appropriate, asking children to sip iced water through a straw facilitates swallowing and provides a helpful focus for distraction during the procedure.

Consider prescribing and administering procedural analgesia as per local protocol pre and/or during procedure.

Where appropriate and with parent/carer consent, during the procedure, allow infants to suck on a dummy that has expressed breast milk or 24% sucrose applied, as this can facilitate swallowing and provide analgesia. For those without consent for the use of a dummy, a gloved finger may also be used.

Parent/carers may also experience anxiety and distress, including if they are involved in holding the patient during the procedure. Following the Child Safe Standards, care should be

taken to keep the parent/carer informed before, during, and after the procedure. Aboriginal families may benefit from support provided by Aboriginal Health Workers.

3.4.7. Sedation considerations

Extreme care must be used with all forms of sedation as it has the potential to impair gag and/or swallow reflexes and increase the risk of gastric tube misplacement. Sedation is not required for the majority of neonates, infants, and children.

3.4.8. Feeding considerations and pre-procedure assessment

There is a risk of aspiration with vomiting during tube insertion. Assessment of risk should be considered for children who have eaten/been enterally fed within the 2 hours before gastric tube placement.

It is recommended that the nostrils and/or oral cavity be assessed to identify any possible abnormalities or obstructions before insertion of the gastric tube.

3.4.9. Guide to gastric tube sizes

The following table provides a guide to gastric tube sizes based on the age of the neonate, infant, or child and the intended purpose of the tube placement.

Tube size	Feeding	Decompression
Pre-term Neonates	5-6Fr	6Fr
Term Neonates (<28 days)	6Fr	8Fr
Infants – children up to 2 years	6-8Fr	8Fr
Children 2-8 years	8Fr	8-10Fr
Children over 8 years	8-12Fr	10-14Fr
Special consideration to tube size selection should be given to children with developmental or physical delay, and others who are very small for their age as a smaller tube may be indicated.		

3.4.10. Positioning

To maintain safety, provide security and comfort, therapeutic holding should be used to insert a gastric tube in neonates, infants and children. For neonates', skin-to-skin contact (kangaroo care) with the parent/carer may be suitable for the procedure. A parent/carer or staff member may be required to therapeutically hold the infant or child during gastric tube insertion.

Depending on the age of the child, different positioning techniques can be used to provide comfort and facilitate correct gastric tube placement during the procedure:

- For a neonate or infant <3 months the use of swaddling with a blanket (hospital baby blanket or own swaddle cloth) can be used, see Diagram 1.
- For an infant >3 months, the cradle position can be used to provide comfort to the infant during the procedure, see Diagram 2.

- For a toddler or child, the sitting position can be used as tolerated. Placing young children in the sitting position securely held by their carer (therapeutic holding) [6], see Diagram 3, helps facilitate correct tube placement, whilst receiving comfort from their carer and allows the child to maintain some sense of control over the procedure. The child should not lean forward, nor should the neck be extended.

Diagram 1 – Swaddling a neonate or infant <3 months

Diagram 2 – Cradle hold of an Infant > 3 months of age

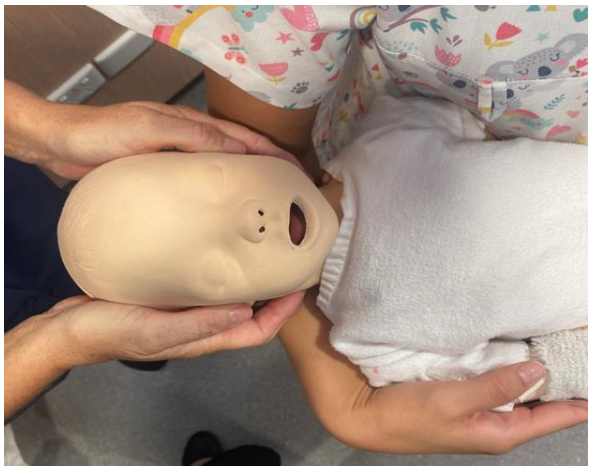


Diagram 3 – Child in seated position held by parent/carer

3.5. Procedure

Ensure the procedure is clinically indicated and that an assessment, including observations for clinical stability, has been carried out to exclude contraindications or potential complications.

Check the manufacturer's recommendations before insertion to ascertain maximum dwell times and specific instructions, which may include lubrication, priming solutions, and where applicable, when to remove the guidewire.

Equipment required for insertion:

- Suction and oxygen should be available.
- Select an appropriate type and size of gastric tube (consider the purpose and proposed dwell time).
    - Polyurethane tubes generally have a dwell time of weeks, and PVC tubes generally have a dwell time of days.
    - PVC tubes are stiffer than polyurethane tubes and are therefore less likely to kink.
- Lubrication – water or water-based lubricant or use the patient's saliva (neonates). Lubricant should not contain any anaesthetic agent.
- pH test indicators.
- 5-10 mL enteral syringe for aspiration.
- Skin barrier wipes/swabs.
- Adhesive tape or device for the securement of NGT/OGT.
- Appropriate personal protective equipment (PPE) for standard precautions, such as gloves.

The following instructions are for the insertion of an NGT. If an OGT is required, the principles remain the same, however, the tube is inserted via the oropharynx.

Steps	Instructions
1	Measure the opening port of the tube from the tip of the nose to the bottom of the ear lobe and to the observed midpoint between the xiphoid process and the umbilicus (Nose-ear-mid-umbilicus [NEMU]) [see Diagram 4].
2	For NGT insertion, lubricate the end of the tube with a thin smear of water-based lubricant, drops of water, or activate the lubricant of a polyurethane tube by following the manufacturer's instructions. For OGT insertion, the patient's saliva can be used as the lubricant, additional lubricant is not generally required.
3	Assess the nostrils for patency to determine the best side for insertion.
4	Gently insert into one nostril and advance the tube posteriorly, aiming the tube parallel to the nasal septum and superior surface of the hard palate. Advance to the nasopharynx, allowing tip of the tube to seek its passage into the oesophagus and stomach until the measured marking is reached, as seen in Diagram 5.
5	Where age appropriate, encourage the patient to swallow and advance the tube as the patient swallows. For neonates or infants, using a dummy with consent or oral sucrose as per local protocol, or for a child with an intact gag reflex, swallowing small sips of water may enhance passage of the tube into the oesophagus.
6	Observe the infant or child for excessive gagging, coughing, wheezing, apnoea, or colour change during placement. This may indicate passage of the tube into the trachea. If passage into the trachea is suspected, withdraw the tube and re-advance once the patient is stable and comfortable.
7	If resistance is met during insertion of the tube, stop advancement, withdraw the tube 1-2 cm, and adjust direction, rotating the tube slightly before reattempting advancement. Never force the gastric tube.
8	Document the length of the tube insertion in the health record.

While gagging and signs of respiratory distress are obvious indicators of incorrect placement, the absence of these signs does not indicate correct placement, especially when inserting in an infant or child with altered consciousness.

Two failed attempts require escalation to an experienced nurse or medical officer who is skilled in the insertion and management of gastric tubes.

▲ **Red Flag:** Should placement, maintenance, and ongoing verification of a gastric tube become hazardous, risking the patient's health and safety, consideration of alternative methods for delivery of nutrition and medications is necessary.

Diagram 4 – Nose-Ear-Mid-Umbilicus (NEMU): Measure the tube from the tip of the nose to the ear lobe. Then measure from the ear lobe to the observed midpoint between the xiphoid process and the umbilicus

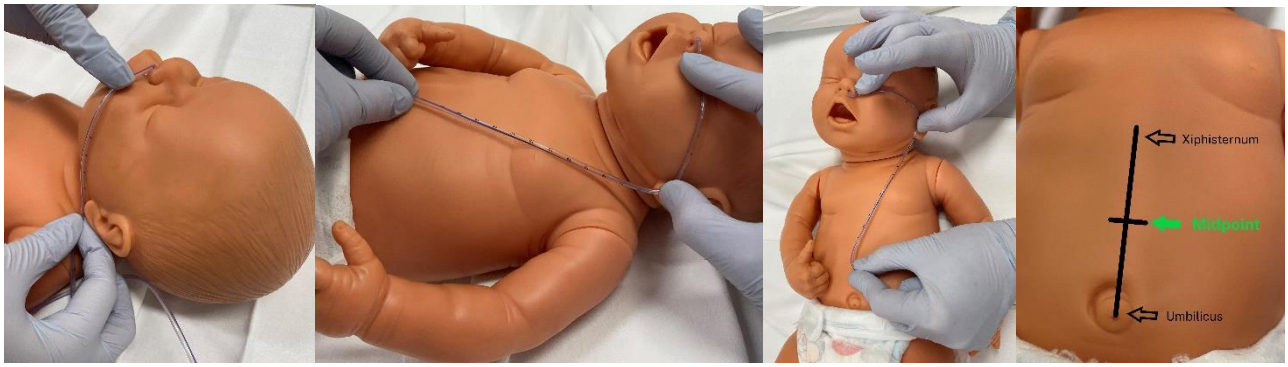
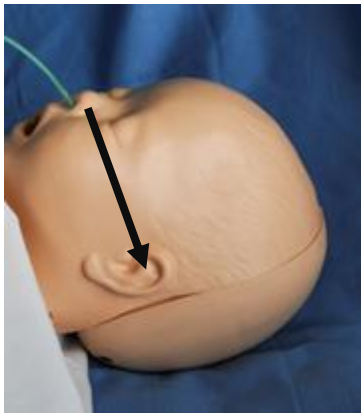


Diagram 5 – Gently insert the tube into one nostril and advance the tube posteriorly, aiming the tube parallel to the nasal septum and superior surface of the hard palate



3.6. Confirmation of correct placement of a gastric tube

The following steps describe the process for confirming gastric tube placement:

Steps	Instructions
Step 1: Measure tube length	**Document the length marking on the gastric tube at the nare/gum post-insertion.** This allows confirmation that the gastric tube was inserted to the initially measured length (using NEMU) at time of insertion, and that the gastric tube has not migrated up or down since insertion. However, it does not confirm the tip of the gastric tube is in the correct place.
Step 2: Clear the tube	**Ensure previous enteral feed, medications, or flushes are cleared from the tube by pushing 5 mL (for a term neonate) or 5-10 mL (for a child) of air prior to obtaining aspirate.** This is **NOT** the "whoosh test". Contaminants may alter the pH of the aspirate and give a false pH reading. For example, sterile water and lubricant can falsely lower the pH to 5 or below.
Step 3: Aspirate	Slowly aspirate a small quantity of fluid from the NGT/OGT with an ENFit/Nutrisafe syringe. If no aspirate is obtained and it is safe to do so, place the patient on their left side and leave the tube uncapped on free drainage, and below the level of the patient's stomach for up to 30 minutes. This facilitates capillary action and pooling of gastric contents. Following this, re-aspirate. Remeasure the correct insertion length using a measuring tape and the NEMU technique. Check against length at the nare/gum post-insertion and advance the tube if necessary. Consider advancing the tube an additional 1-2 cm. Re-aspirate. If no aspirate is obtained, **do not use the gastric tube** and escalate to a medical officer competent in the insertion and management of gastric tubes.
Step 4: pH	**Check pH using an approved pH indicator strip.** **pH less than or equal to 4.0** indicates correct placement in the stomach with a high safety margin. Aspirated stomach contents have a median pH of 2.0. **pH of 4.5 or 5.0** indicates either stomach or distal oesophageal placement. Whilst rare in this pH range, sentinel events still occur and the gastric tube should NOT be used without additional placement confirmation techniques, safety measures and consideration. Consider remeasuring and advancing the tube an extra 1-2cm due to the possibility of distal oesophageal placement and recheck the pH. **pH 4.5 or 5.0** indicates an X-ray is required for all 'at risk' neonates, infants, and children before commencement of feeds on all initial insertions. If subsequent reinsertion is required, an X-ray is performed as per the gastric tube management plan (see Section 2.6.3). If the child is on acid suppressing medications and/or on continuous feeds, see Section 2.6.3.

Also see Appendix 2 for confirming the gastric tube position.

DO NOT:

The following techniques do **NOT** confirm placement and must **NEVER** be used:

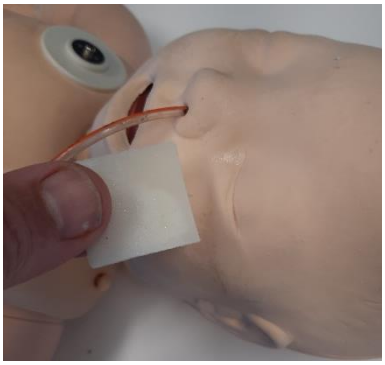
- Auscultation of air insufflated through the feeding tube (the 'whoosh' test)
- Absence of respiratory distress
- Blue litmus paper to test the acidity or alkalinity of aspirate
- Bubbling at the proximal end of the tube
- Appearance of the feeding tube aspirate
- Instilling then aspirating the same fluid prior to pH testing.

Gastric tubes should be secured using suggested taping methods or fit for purpose medical securement devices.

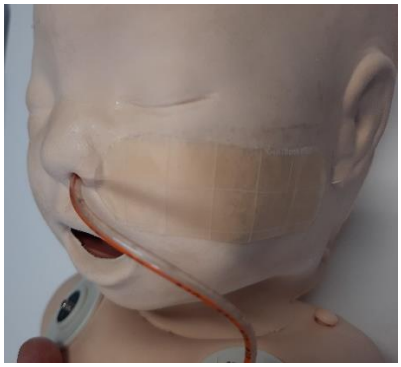
Diagram 6 – Suggested taping for securing NGT

Cut tape in preparation for procedure.

Prepare skin using barrier wipe if appropriate.



Secure gastric tube with an appropriare adhesive or fixation dressing.



3.6.1. Preventing a medical device related pressure injury (MDRPI)

To prevent or minimise the risk of a medical device related pressure injury (MDRPI), consider the following:

- The area at the point of insertion must be checked once per shift at a minimum.
- Careful application of tapes (including colloid dressing) to ensure direct pressure is not applied to the side of the nare (for NGT)/gum or lip (for OGT).
- In older children and adolescents, consider securing gastric tubes in line with NSW Health Guideline *Insertion and Management of Nasogastric and Orogastric Tubes in Adults* (GL2023_001).
- Check and clean the nasal mucosa within the nostril. This is to be done at least once every shift and with every tape change.
- Assess the condition of the gum or lip (for OGT) and skin on the nose (for NGT) for blanching, redness, and skin breakdown.
- Change adhesive tape as required. When changing, slightly adjust both the tube and tape positions to minimise pressure points.
- Protect skin by using a barrier wipe before replacing the tape.

3.6.2. Trouble Shooting Guide

The following table provides clinicians with suggested actions to overcome common problems with the insertion and management of gastric tubes:

Potential Problem	Risk Factors/ Common causes	Actions	Prevention
Aspirate pH 4.5-5.0	Oesophageal Placement	Check insertion depth/length at nare/gum. Confirm measurement with paper tape or new gastric tube using NEMU. Advance tube 1-2 cm.	Always use NEMU measurement process (see Section 3.5).
	Continuous Feeds Acid Pump Inhibitors	A clear plan or acceptable adjusted pH range for confirming the tube's position must be documented in the health record.	If possible, pH should be tested just before receiving these medications.
	Newborn/amniotic fluid	Do not feed/use the tube and discuss with the medical officer. Allow 2 hours and retest pH.	Do not insert a tube in the first few hours of life unless for emergency care.
Aspirate pH5.5	Medical Management Plan pH >5	Do not use until X-ray is performed and correctly interpreted unless a clear plan or acceptable adjusted pH range for confirming the tube position is documented in the health record.	Consider the indication for acid pump inhibitors. pH must be tested just before receiving these medications.
	Tube has advanced transpyloric	If the tube has advanced through the pyloric sphincter, following review of the X-ray, withdraw the tube by the indicated length to position it in the stomach. Re-test the pH after withdrawal.	
	Newborn/amniotic fluid	Do not feed/use gastric tube and discuss with medical officer. Allow 2 hours and retest pH.	Do not insert tube in first few hours of life unless for emergent care.

Potential Problem	Risk Factors/ Common causes	Actions	Prevention
If unable to obtain an aspirate	Tube not advanced far enough Tube not positioned in gastric fluid due to patient positioning	Turn the patient onto their left side. This may allow the tip of the gastric tube to move to a position where fluid has accumulated. Instil 1-5 mL of air into the tube using a 5-10 ml ENFit/Nutrisafe syringe (to reposition the tube tip to reach accumulated stomach fluid). DO NOT USE WATER TO FLUSH. If the patient can tolerate oral fluids, offer oral fluids and reattempt aspiration. Give mouth care to stimulate the gastric secretion of acid. Adjust tube position (advance or pull back tube by 1-2 cm) and re-aspirate. Wait 15-30 mins – re-aspirate. If using a dual port NGT, ensure the second port is tightly sealed. **If aspirate not obtained, do NOT use the gastric tube.** Confirm position by X-ray or remove/replace gastric tube and recommence checking procedure.	
Blocked gastric tube	Medication type/ interactions/ preparation Inadequate flushing or poor flushing technique	Flush the gastric tube in a pulsating manner (push-stop, push-stop) with warm water, if it is safe to do so and considering the child's age, size, and clinical status. 5-10 ml for paediatric patients unless otherwise indicated by the treating team. It may be appropriate to allow the warm water to soak by clamping/capping the tube to assist with unblocking. Neonates flush with 1-5 ml air and/or replace the tube where clinically safe/indicated. **There is no evidence to support the practice of using carbonated or acidic products such as Coca Cola™ to unblock gastric tubes.**	Flushing is the single most effective action that prolongs the life of gastric tubes. Flushing should occur before, during and after administration of enteral medications and feeds.

Potential Problem	Risk Factors/ Common causes	Actions	Prevention
Dislodgement or accidental removal	Poor securement Patient pulling at NGT/OGT	Dislodgement – stop feed/medication immediately. Consider if the gastric tube can be repositioned or if it needs to be removed. Do not use the gastric tube until the correct position is confirmed. The decision to reinsert should consider the patient's ongoing nutritional needs, clinical status, and be made in consultation with an experienced nurse, medical team and/or dietitian.	Use of appropriate securement device/ technique. Regular assessment of the securement device as per MDPRI.

3.6.3. Medical Management Plan for a patient with pH>4.0

Neonates, infants, and children receiving acid pump inhibitors and continuous feeds need to have a specialised care plan developed in consultation with the treating consultant to determine appropriate gastric tube confirmation techniques when pH is >4.0. [1] [2] [3]

Ongoing confirmation of gastric tube placement by pH testing utilising patient specific benchmarking of gastric pH may be deemed acceptable by the patient's senior medical officer. This acceptable pH must be clearly documented in the patient's health record and discharge summary, if relevant, by the treating medical officer. This should be done at least once per shift or before the administration of a medication or feed.

▲ **Red Flag:** Any alteration of acceptable pH will decrease the margin of safety for confirming correct gastric tube placement. A pH of 6.0 or above must never be used to confirm tube position. These risks must be weighed against ongoing exposure to radiation or repeated ultrasound examination, explained to the patient or their parent/carer, and their consent must be clearly documented in the health record.

3.6.4. Radiological confirmation (X-ray) on insertion

It is recognised that the best method of determining gastric tube location is provided by a reliably obtained and interpreted X-ray that visualises the entire course of the tube. [4] [5]

However, many factors, including radiation exposure, delay in obtaining and interpreting radiographs, and risk of gastric tube misplacement while moving the patient, contribute to the need for other reliable methods for confirming gastric tube placement.

X-rays performed to check the position of a gastric tube must clearly state that "gastric tube position" is one of the clinical indications for performing the imaging on the radiology request.

Documentation following X-ray must include:

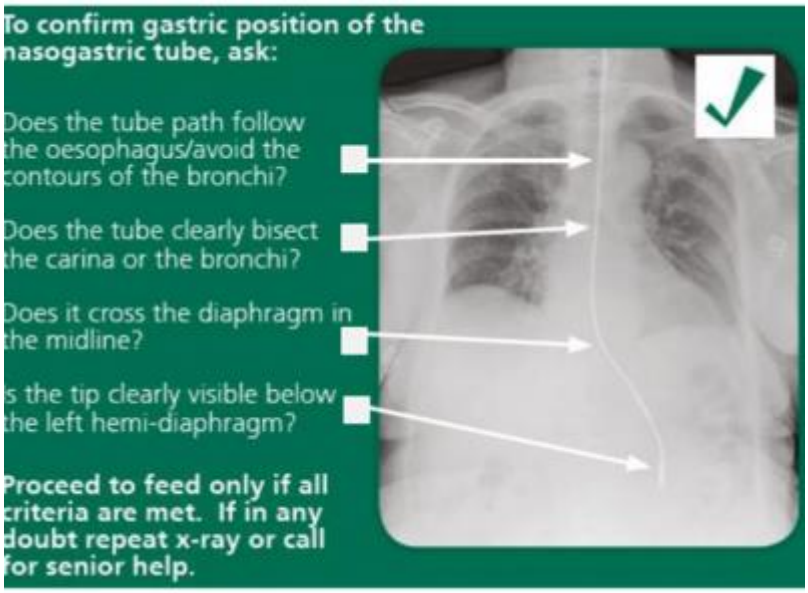
- Name and designation of the clinician who confirmed the position of the gastric tube.
- Confirmation that any X-ray viewed is the most recent for the correct patient.
- That the position of the gastric tube was interpreted using the '4 criteria' [4] [5]. All 4 criteria must be met:

- Gastric tube follows the path of the oesophagus.
- Gastric tube seen bisecting bronchi.
- Remains midline to the level of the diaphragm and deviates to the left thereafter.
- The tube tip is seen below the diaphragm (about 7cm).

- Clear instructions as to required actions, for example, NGT/OGT is safe to use for feeding.

Consider ultrasound confirmation in neonates, infants, and children with chronic and/or complex care needs.

Diagram 7 – Chest X-ray demonstrating correct gastric tube placement



([European Society of Radiology Congress Poster])

3.7. Gastric tube care and maintenance

When to re-check the gastric tube position:

- Before administering each feed and/or giving medication.
- At least once per shift during continuous feeds or as per medical officer orders.
- Following episodes of respiratory distress, coughing, vomiting or retching.
  - Note: the absence of coughing does not rule out misplacement or migration.
- If suspicion of gastric tube displacement, for example, poor tolerance to feed, reflux of feed into the throat, discomfort in the throat, a change in gastric tube length is suspected.
- Any change in clinical condition.

- For continuous feeds, verify external markings and confirm gastric aspirate pH at least once per shift and at change of feed bottle or medication administration (whichever is shorter).

3.8. Removal of gastric tubes

Confirm the need for removal of the gastric tube. This must be documented in the health record by a treating medical officer before the gastric tube is removed.

Removal of the gastric tube must be performed safely by trained and competent health professionals, adhering to standard precautions.

Procedure for removal should include the following process:

- The 5 moments of hand hygiene must be practiced before, during, and after this procedure.
- Turn off suction or continuous feeding, if applicable.
- Position the patient in the supine position.
- Elevate the head of the bed as tolerated by the child.
- Encourage the presence of the parent/carer for support and prepare the patient.
- Gently remove the tape from the face. Consider using adhesive remover or saline wipe to assist in the removal of tape.
- Pull the gastric tube out of the mouth or nose using a swift, consistent motion.
- If resistance is met, stop the procedure, clinically assess the patient, and seek medical advice.
- Observe that the tip of the gastric tube is intact on removal. If it is not, seek advice from a senior staff member.
- Documentation of the time and date of removal in the health record

Post procedure:

- The clinician must document the removal in the patient's health record.
- Continue to observe the patient for any changes in condition or vital signs post tube removal.
- Escalate any signs of deterioration as per local CERS protocol.

3.9. Incident reporting

All incidents, including near misses and adverse events involving gastric tubes, must be reported to the appropriate management team and documented in the ims+ system.

Use of an incorrectly positioned gastric tube resulting in serious harm or death is classified as an Australian Sentinel Event and requires a serious adverse event review following the NSW Health Policy Directive *Incident Management* (PD2020_047).

3.10. Minimum documentation requirements

There are minimum documentation requirements for all health professionals involved in the patient's care. These are listed below.

3.10.1. Pre-insertion of the gastric tube

Prior to insertion of a gastric tube, the following key details must be documented in the health record:

- Medical order for tube insertion, including indication (for example, for feeding, medication administration, decompression).
- Documentation from nursing staff if following ECAT protocol (see NSW Health Policy Directive *The Use of the Emergency Care Assessment and Treatment (ECAT) Protocols* [PD2025_025]).
- Parent/carer and/or patient consent.
- Risk assessment outcomes.

3.10.2. Gastric tube insertion

When a gastric tube is inserted, any attempt at tube insertion must be documented in the health record, including unsuccessful attempts and reasons for failure.

The following key details must also be documented in the health record:

- Type and size of gastric tube.
- Nostril used (not applicable for orogastric tube insertion).
- The exit-point centimetre mark at the insertion point.
- Amount and nature of gastric aspirate.
- pH of aspirate.
- Any complications or issues.
- Any failed attempts – include details of staff who were consulted during the escalation process.
- Outcome following the escalation pathway.
- Medical order for X-ray and/or gastric tube management plan.
- Positive confirmation of correct placement, including method of confirmation.

3.10.3. Gastric tube use, maintenance, and care

At least once per shift, and before the use of the gastric tube for enteral feeding or medications, the following key details must be assessed and documented:

- Tube position. If the gastric tube is repositioned, placement must be reconfirmed.
- pH.

- Skin integrity at the entry point.
- Any complications or issues.

3.10.4. Gastric tube removal

Prior to the removal of a gastric tube, the following key details must be documented in the health record:

- Order for planned gastric tube removal must be documented by the medical officer.
- Date, time, and indication for gastric tube removal.
- If gastric tube removal was unplanned, the date and time, including that it was unplanned.
- The removal outcomes, including that the tip has been confirmed as intact and removed, and any complications or issues arising during removal.

4. Special Considerations for Orogastric Tubes

4.1. Indications for insertion of an orogastric tube

The principles for insertion and management of orogastric tubes (OGT) and nasogastric tubes (NGT) [see Section 2] are closely aligned. Differences for orogastric tube indication, route, insertion, and tube management are specified in the following sections.

Neonates are obligate nose breathers, and the presence of an NGT may increase airway resistance.

OGTs may be considered in:

- Very low birth weight neonates less than 1500 gm.
- Neonates needing respiratory support. Consider re-siting from an NGT to OGT for neonates trialling respiratory support so as not to block the nare and impact respiratory effort.
- Structural or anatomical abnormality (such as choanal atresia, cleft lip/palate)
- Nasal trauma.

4.2. Insertion of an orogastric tube

The placement of an orogastric tube may be required in situations where nasopharyngeal insertion is contraindicated (such as patients with a fracture to the base of the skull). The decision to insert an orogastric tube must be made by an experienced member of the medical team, indicating the rationale for the route of insertion.

If an OGT is required, the principles of insertion (see Section 3.5) remain the same as for an NGT, however, the tube is inserted via the oropharynx.

4.3. Management of an orogastric tube

The ongoing care of an OGT is similar to an NGT (see Section 3.7), including the process for:

- confirmation of correct placement (see Section 3.6)
- when to re-check position (see Section 3.7)
- tube care and maintenance (see Section 3.7)
- removal (see Section 3.8).
- incident reporting (see Section 3.9)
- documentation (see Section 3.10).

Differences in OGT management include:

- The tube measurement is to be taken at the tube marking at the level of the teeth/gums (if teeth are absent).
- If the patient is intubated, the OGT may be secured to the endotracheal tube.
- If the patient is not intubated, the OGT must be secured so it does not dislodge or displace.
- OGT can also be secured on the top lip and may be better tolerated (not pictured).

Diagram 8 – Securement and taping of orogastric tube (endotracheal tube and lower lip)

Securing OG tubes for an infant on CPAP

Tube feeding – Babies in Neonatal Care

5. References

The following citations have all been reviewed as part of the compilation of this Guideline. A review of published evidence demonstrates that there is no updated reference. A bibliography is included listing contemporary supportive evidence for this Guideline.

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7. Appendices

1. Pre-insertion and post-insertion checklist for nasogastric and orogastric tubes
2. Algorithm for confirming gastric tube position

7.1. Pre-insertion and post-insertion checklist for nasogastric and orogastric tubes

Pre-insertion checklist:

Confirm the following before commencing the procedure:

- ☐ Confirm procedure is indicated and ordered by a medical officer/nurse practitioner/ECAT.
- ☐ Contraindications and special precautions are considered.
- ☐ Clinicians introduce self to the patient and the parent/carer.
- ☐ Complete Level 1 Procedures safety check, including consent (PD2025_006).
- ☐ Patient's identity confirmed (PD2021_033).
- ☐ Allergy/adverse reaction check.
- ☐ Record of minimum set of baseline vital sign observations (PD2025_014).
- ☐ Confirm paediatric emergency equipment is accessible and functional, including suction and oxygen.
- ☐ Determine whether parent/carer therapeutic holding is desirable or appropriate.

Gather required equipment:

- ☐ Nasogastric/orogastric tube of appropriate size and type.
- ☐ ENFit/Nutrisafe syringe to access the enteral tube.
- ☐ Personal protective equipment.
- ☐ Securement tape, colloid dressing, and skin barrier wipe.
- ☐ Water soluble lubricant.
- ☐ pH indicator strip (**DO NOT** use litmus paper).

Additional equipment as required:

- ☐ ENFit gastric drainage bag and spigot/valve/gastric suction pump, if required.
- ☐ Dummy, straw or syringe and water for sips (if allowed) during insertion.
- ☐ Local anaesthetic sprays (if indicated) – order required by medical officer.
- ☐ 24% Sucrose solution.

Explain the procedure to the patient and parent/carer:

- ☐ Explain the procedure, including the rationale.
- ☐ Explain any parent/carer involvement in therapeutic holding and advise of alternative options. Position patient as appropriate.
- ☐ Ensure safe space for the procedure to be undertaken - consider privacy.

- ☐ Reassure patient and parent/carer and implement comfort and distraction interventions (Communicating procedures to children).

Post-insertion checklist:

Proceduralist to document in the patient's health record. This includes:

- ☐ Any attempt at gastric tube insertion, including unsuccessful attempts and reasons for failure, and details of staff who were consulted during the escalation process.
- ☐ Nostril used (not applicable for orogastric tube insertion).
- ☐ Type and size of the tube.
- ☐ Measurement mark at nare (nasogastric) or teeth/gum (orogastric).
- ☐ Securement technique used.
- ☐ pH reading obtained.
- ☐ Colour, content and amount of aspirate where clinically appropriate.
- ☐ If confirmation via X-ray is required, refer to the medical officer/nurse practitioner.
- ☐ Document and communicate 'Nil by Tube' until the position of the tube is confirmed as correct by the medical officer/nurse practitioner.
- ☐ Record a minimum set of post-insertion vital sign observations (PD2025_014).

Note: For any child being discharged home with a gastric tube, refer to the Sydney Children's Hospital Network Practice Guideline *Enteral Feeding Tubes and the Administration of Enteral Nutrition*.

7.2. Algorithm for confirming gastric tube position