Gastrostomy, Care of Infant in Newborn Intensive Care Unit (NICU)

Procedure Responsibilities and Authorisation

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Target Audience	Nurses

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Procedure Review History

Version	Updated by	Date Updated	Summary of Changes
3	Joyce Mok	Oct 2015	Due for review
4	Richard Pagdanganan	January 2019	3-yearly update
5	Richard Pagdanganan	December 2022	3-yearly update

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Gastrostomy, Care of Infant in Newborn Intensive Care Unit (NICU)

1 Overview

1.1 Purpose

- To outline procedure for care of infants with gastrostomy
- To provide nutrition to infants who are unable to feed orally due to the following conditions:
  - Neuromuscular disorders
  - Congenital gastro-oesophageal abnormalities e.g. oesophageal atresia
  - Severe cerebral palsy
  - Traumatic brain injuries
  - Gastro-intestinal disorders requiring alternate route for nutrition
  - Difficulty swallowing i.e neuromuscular disorder

1.2 Scope

Te Whatu Ora Waikato staff working in NICU.

1.3 Patient / client group

Neonates and infants in NICU.

1.4 Definitions

CNS	Clinical Nurse Specialist
Gastrostomy	This is a surgical opening through the abdominal wall into the stomach. A feeding device is inserted through this opening into the stomach. This allows for the infant to be fed directly into his or her stomach, bypassing the mouth, throat and oesophagus. The tract between the stomach and abdominal wall matures after 8-12 weeks, allowing ease of tube changes.
Mic Gastrostomy tube (Mic g tube)	Mic G tube is a standard length silicone tube and has an internal balloon and external ring flange. It is initially placed via surgical laparotomy, endoscopically or laparoscopically.
Mic-Key Button	Mic-Key button is a silicone low-profile device and has an internal balloon. It is placed into an existing stoma tract or can be placed endoscopically, laparoscopically or with a combined procedure.
NNP	Neonatal Nurse Practitioner
PEG tube	Percutaneous Endoscopic Gastrostomy tube is most often placed and removed endoscopically. PEG is a standard length silicone tube and has internal retention dome and an external flange. It must be removed by a surgeon or clinical specialist to prevent serious complications.

Notes: The PEG is inserted first and may be replaced if required usually after 3 months with the Mic-Key button, to allow stoma time to heal and the gastrostomy tract to mature. This usually requires a further General Anaesthetic.

2 Clinical Management

2.1 Competency required

- Registered Nurse who has completed Level 2 orientation.
- Enrolled Nurse who has completed Level 2 orientation and under the direction and delegation of a Registered Nurse.

2.2 Procedure

2.2.1 Care of gastrostomy site

Equipment

- Sterile normal saline or sterile water
- Sterile cotton tipped applicators
- Sterile gauze/topper for keyhole dressing

Newly formed stoma site

1. Observation

- After initial insertion and during the first 10-14 days, observe site for bleeding, discharge and inflammation to detect signs of haemorrhage or infection at stoma site.
- Check gastrostomy device is secure to prevent dislodgement.
- Stoma site should not be immersed in water for the first three weeks to allow stoma to the tract to be fully healed and to keep site clean and dry.

2. Stoma care

DAILY and PRN site cleaning:

- Perform hand hygiene
- Use personal protective equipment, e.g. gloves, while cleaning the site.
- Use sterile normal saline or sterile water and matchstick swab for cleaning stoma site to prevent infection and formation of granulation tissue.
- Gently soften and remove any crusts from around and underneath the disc to enable observation of the stoma site. Observe the device for signs of leakage of fluid, infection, skin irritation, or hypergranulation of the stoma. Report to the medical staff/CNS/NNP if these are observed.
- Use a clean and dry cotton tip applicators to dry the skin surface well. Do not touch the area with your hands.
- Place a dry keyhole dressing around tube. Avoid dressing if skin is intact because gauze restricts air flow and may break skin down, resulting in infection.

Keyhole dressing

cut to fit

Notes:

- Stay sutures and/or Saf-T-Pex fixation buttons, if present, around a newly formed gastrostomy should be removed post-operatively as per the operation note to avoid wound infection/permanent scarring. The timing will vary depending upon technique, but generally sutures will be removed at Day 5-7 post-op and Saf-T-pex buttons at 14 days post-op.

3. Reducing post-operative discomfort

- Administer analgesia as prescribed.
- Decompress the stomach by attaching a syringe barrel to the feed port to allow excess gas to be released.
- The tube may be left for free drainage as per surgeon's instructions.

4. Checking position of a PEG/gastrostomy tube

- Document the tube length, which is the baseline for checking the position of the tube Generally this is <2cm at the skin level.
- Check the position of the tube to ensure the external flange is secure, not too tight or too loose.

  Notes:

- If too tight, the stoma will protrude through the fixation plate.
- If too loose, it will cause the tube to move back and forth. This will cause irritation to the tract, resulting in stretching of the tract diameter and causing leakage of stomach contents on to skin.

5. Rotating the Mic-Key button gastrostomy device

First rotation

- Check with the surgeon's timing for the first rotation: First rotation is done only when the stoma is healed and free of infection or discharge. This is usually 6 weeks after it was inserted.

Regular rotation

- Regular rotation and/or 'dipping' of device is performed

  - to prevent 'buried bumper syndrome', where the internal fixation disc becomes buried with the stomach lining growing around it (relevant to PEGs only)
  - to reduce the possibility of tissue overgrowth around the tube,
  - to prevent soreness under the external ring
- Perform hand hygiene
- Clean site
- Rotate the device in a full circle during daily cleaning according to surgeon's instructions.

Figure 2

Established stoma site

1. **Cleaning site**

- Clean site **DAILY** and more often if necessary with a mild soap solution and luke warm water to remove skin irritants and prevent infection. This can be done during bath time.
- Dry site well.
- No dressing is required once the site is healed, unless there is discharge from stoma site.
- Observe site before each feed for any oozing, discharge and infection and, if present, take a swab for culture.

2. **Rotating gastrostomy device**

- Rotate gastrostomy device in a full circle during daily cleaning to prevent skin breakdown.

3. **Checking balloon**

- Check balloon weekly (but only at least 6 weeks from initial placement of a new gastrostomy) to ensure the retention balloon is anchoring inside the stomach and helps to keep the stoma from leaking.
- Two person procedure: One checks the balloon and the other secures the device.
- Measure weekly the amount of water inside the balloon:
  - Insert a 5ml syringe into the identified balloon port and withdraw the water and discard.

- Fill the syringe with the correct amount of sterile water and inject into the balloon port. The volume of water depends on the type of device (refer to manufacturer's instructions e.g. recommended volume for the Low Volume Balloon is 2-3ml.)
- **Do not use air to inflate the balloon, use sterile water** because air will migrate over several hours causing the balloon to deflate and saline/tap water may enable salt crystallisation in the balloon over time.
- Document in Care Plan and Clinical Notes date of checking and date next check is due.

2.2.2 Daily maintenance of gastrostomy

1. Must Do

- Perform hand hygiene
- Inspect stoma site for redness, swelling, discomfort or gastric leakage.
- Check position of devices.
- Rotate the Mic-Key daily during cleaning according to surgeon's instructions.
- Gently clean the skin around the stoma.
- Flush device before each use by using a 50ml catheter-tip syringe with 5ml of warmed sterile water to confirm the device is patent before commencement of feed.
- Flush the gastrostomy tube after feeding using a 50ml catheter-tip syringe and 5ml of sterile water to prevent blockage by milk curds.
- Use a 50ml catheter-tip syringe and 5ml of sterile water for each flush to prevent damage of the tube by increased pressure due to build-up of milk deposits.
- Verify balloon volume weekly as described in previous section.

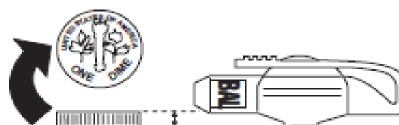
2. Observation

- Monitor stoma site for:
  - Redness
  - Bleeding
  - Purulent exudates
  - Pain/discomfort
  - Leakage from device
  - Leakage around tube from stoma

General observations:

- Changes in bowel motion e.g. increased loose stool with or without fever
- Vital signs monitoring 4-8 hourly.
- Take swab from stoma site if discharge/oozing and send to laboratory for culture.

- Leakage can be due to colonisation with Candida as the anti-reflux valves of the low profile device (e.g. Mic-Key button) are known to be prone to colonisation with thrush.
- Leakage can cause skin excoriation therefore must be dealt with promptly because leaking from the device due to high acidity of gastric contents can cause valve failure.
- Position of the SECUR-LOK ring. If both the tube and the ring are dry, friction holds them together preventing the tube from sliding inside the stomach.
- Position of the button should be 2-3mm above the skin (refer to diagram below). If the button is too close for a long time a pressure injury could result.



(Figure 3: Position the button this far above the skin)

2.2.3 Management of gastrostomy problems

Equipment

- An extra PEG/gastrostomy tube or Mic-Key button of the same size and length and one size smaller
- A Foley catheter of same size and one size smaller (kept in the store room)
- 50ml catheter tip syringes.

Note: If any of the following problems occur, inform the medical staff

1. Manage dislodge tube

- DON'T PANIC
- Place a dressing over the stoma
- Inform CNS/NNP/Registrar/Surgeon
- Prepare correct sized gastrostomy tube or Foley catheter for emergency replacement to maintain patency of tract until new tube can be inserted. For a well formed tract, a feeding tube or Foley catheter can be placed in the tract without inflating the balloon to keep it open whilst awaiting re-insertion.

2. Prevent and manage tube obstructions

- Prevent blocked tube by flushing the tube with sterile water before and after each feed to prevent tube obstruction.
- Use a 50ml catheter-tip syringe and flush with 5ml of water before and after each feed.
- If the obstruction is visible inside the tube above the skin, massage the tube and try to gently aspirate the blockage out. Do not use force.

3. Manage and reduce leakage from stoma site

- If suspect gastric leakage, gently clean and dry site, then check the site 30 minutes later to see if there is any fresh leakage to ascertain whether it is an actual leakage and not spill from previous feeding or tube check.
- Check the amount of water in the balloon. If correct amount of water remains in the balloon, the device may be poorly sized or inadequately stabilised. Inform CNS/NNP/Registrar/Surgeon. If it has lost the prescribed amount of fluid, the tube may need replacement.
- Check for proper internal balloon placement by aspirating stomach contents to assess for gastric residues.
- Verify that the SECUR-LOK ring rests just above the skin by 2-3mm.
- Position infant at 30° angle with head above stomach as leakage may be due to improper patient positioning.
- Lower the feeding syringe to decrease rate to prevent leakage that is caused by infusing feeds too rapidly.
- Discuss with CNS/NNP/Registrar and whether need to change to smaller, more frequent feeds as leakage may be due to too large a volume.

4. Prevent and manage skin excoriation

- Use barrier ointment e.g. Stomahesive or Cavilon cream.
- If infected by thrush use clotrimazole 1% if thrush is suspected **- do not use** a zinc-based product because zinc-based product may worsen the infection - .
- Use topper or foam dressing to absorb excess ooze.
- Apply thin duoderm to protect and aid in healing of excoriated skin.
- Consult Wound Care Resource Nurse.

5. Reduce and manage granulation

- Use foam dressing to apply pressure and reduce granulation.
- Consult Wound Care Nurse Specialist.
- Doctor may prescribe treatment (e.g. silver nitrate) to granulation tissue.

6. Prevent and manage PEG tube migration

- Document the tube length after the insertion of PEG tube and this is the baseline for checking position of tube.
- Before each feed, ensure the tube number above the external flange is the same as the length recorded after insertions.
- If the numbers are different, the tube must be adjusted because:
  - Balloon may have slipped away from the inside stomach wall and could cause intestinal obstruction.
  - Pressure may build inside the stomach causing leaking from the stoma, nausea and/or vomiting.
  - If the tube looks longer, check the number above the ring because the balloon may have a slow leak causing it to slide out of the stomach.
- Inform the surgeon/medical staff/CNS/NNP if tube migration occurs as tube may need repositioning.

7. Caring for the infant with diarrhoea

- Warm up milk before feeding.
- Check the PEG/gastrostomy tube position to ensure it has not slipped forward into the intestine. If the tube slips forward, milk will enter the intestine directly, not the stomach, causing diarrhoea and other problems.
- Consult the surgeon/ dietician if needed.

8. Caring infant with nausea/vomiting

- Stop the feed at once to prevent aspiration that will increase the risk of pneumonia.
- Disconnect the delivery set.
- Check position of PEG/gastrostomy tube.
- May need to aspirate stomach content using a catheter-tip syringe.
- Check for residue if the feed backs up in the extension set or infant is nauseating.
- Check the residue 30 minutes later and restart feeding if the amount is less than at the first check.
- Report to CNS/NNP/Registrar and document.

2.2.4 Feeding via PEG tube

Equipment

- PEG tube

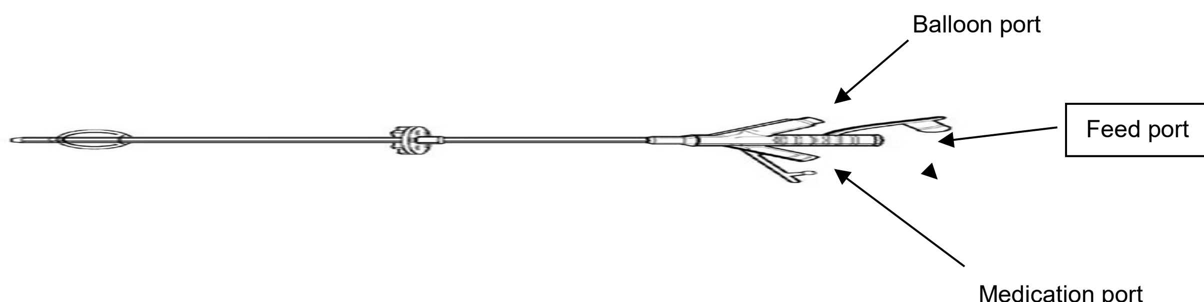


Figure 4

- 50ml catheter-tip syringe for aspirating & feeding
- Sterile water for flushing before and after feed
- Warmed feed

1. Preparations

- Perform hand hygiene.
- Gather equipment and prepare milk according to NICU Nursing Procedure: *Labelling, handling, storage, transport and administration of human milk in New Born Intensive Care Unit (2771).*
- Perform hand hygiene again.
- Position infant at 30° angle with head above stomach to aid feed tolerance and reduce likelihood of gastric reflux.
- Assess position and ensure correct length of tube.
- Check for any leakage to ensure the tube is not displaced or blocked.

2. Feeding

- Flush with 5ml of warm sterile water to clear the residue in the tube.
- Before adding milk, disconnect syringe from gastrostomy device to prevent injury to stomach lining by excess negative pressure.
- Remove plunger.
- Re-insert syringe barrel to gastrostomy tube feed port.
- Pour feed into the syringe barrel at level of stomach.
- Raise the syringe to a height where milk will gravity feed slowly over approximately 20-30 minutes, if on full feeds, to mimic normal stomach filling process.

- Reduce height of syringe if feed is going too fast to avoid feeding too rapidly causing nausea, vomiting, abdominal cramps (colic) and diarrhoea.
- Provide a pacifier (after parental consent is obtained) during feeding to associate oral gratification with a full stomach and to aid development and coordinate with suck/swallow reflexes.
- Put 5ml of warmed sterile water into the syringe after feeding to prevent milk build up inside tube and to keep air from entering the stomach.
- If baby is on restricted fluid, the amount of sterile water for flushing may need to be reduced, e.g. 3-4ml.
- Disconnect the syringe and close the feed port.
- Handle infant gently post feed and allow infant to rest in comfortable upright position for 20-30 minutes.
- Perform hand hygiene.
- Document volume and tolerance of feed on fluid balance chart

2.2.5 Feeding via Mic-Key Button Gastrostomy Tube

Equipment

- 50ml catheter-tip syringe (on top of the silver shelf in the store room, in a white plastic container)
- SECUR-LOK extension sets for gastric feeding
- Warmed sterile water
- Warmed feed

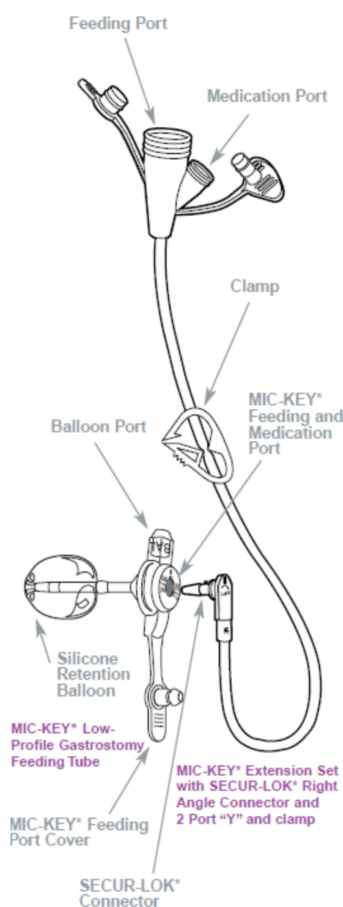


Figure 5

1. Check for tube position and patency

- Check during first feed in the morning.
- Perform hand hygiene.
- Gather equipment.
- Shake the extension set empty of any Milton solution.
- Use the catheter-tip syringe containing 10ml of warmed sterile water.
- Prime the extension set until 5ml of warmed sterile water is left in the syringe for flushing the tube before feeding to ensure patency of tube and check for leakage.
- Check size of tube, stoma length and placement.
- Connect SECUR-LOK extension set (refer to diagram below) to the Mic-Key button feeding Port.
- Insert the extension set securely to the feed port, push firmly and twist ¼ turn to secure the connection.

- Align the black line on the set (D) with the black line on the MIC-KEY feed port.

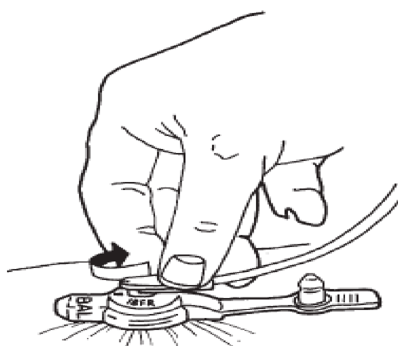


Figure 6

- Gently aspirate gastric contents and test with pH strips to confirm the correct tube position inside the stomach.
- Flush with 5ml of warmed sterile water.
- Check for leakage around the stoma.
- If there is a leak, reconfirm proper balloon inflation (refer to "Checking balloon" on page 6).
- Document procedure in clinical notes.

2. Feeding

- Perform hand hygiene.
- Gather equipment.
- Perform hand hygiene again.
- Confirm position of button.
- Check for leakage around the stoma.
- Position infant at 30° angle with head above stomach to aid feed tolerance and reduce risk of gastric reflux.
- Ensure SECUR-LOK extension set is connected to the Mic-Key button securely and correctly. Connect SECUR-LOK extension set (refer to diagram above) to the Mic-Key button feeding Port.
- Remove plunger from syringe and attach the barrel of the 50ml catheter-tip syringe to extension set and prime with sterile water, using clamp to keep 5ml of sterile water in the tube.
- Hold syringe at level of stomach, release clamp and flush the tube with the 5ml of sterile water in the syringe. If there is a leak, reconfirm proper inflation of the balloon.
- Clamp the tubing when it is nearly empty.
- Pour in the warmed feed and unclamp.

- Hold syringe at level of stomach and slowly raise the syringe until feed is being administered by gravity over a 20-30 minutes to mimic normal stomach filling process.
- Lower syringe to prevent feed being administered too quickly to avoid nausea, vomiting, colic or diarrhoea.
- Provide positive oral, verbal and tactile stimulation if infant awake e.g. offer pacifier (after parental consent) to aid development of coordination of suck/swallow reflexes and for infant to associate oral gratification with feeling of stomach fullness.
- Observe behavioural cue to avoid over-stimulation.
- Upon completion of feed, flush the extension set and Mic-Key with 5ml warm sterile water to clear the tubing and to avoid residue build-up.
- If baby is on restricted fluid, amount of sterile water for flushing may need to be reduced, e.g. 3-4ml.
- Handle infant gently after a feed and allow infant to rest in a comfortable upright position for 20-30 minutes.

3. Care of SECUR-LOK extension set after each feeding

- Disconnect the SECUR-LOK extension set and replace the Mic-Key feed port plug.
- Wash the extension set with warm soapy water and rinse thoroughly.
- **Tubing must be washed in warmed soapy water and leave it to dry. The extension set can be re-used up to 14 days.**

4. After care

- Perform hand hygiene.
- Document on fluid balance chart.

2.2.6 Administration of Medication

Equipment

- Two 10ml luer-tip syringes
- Warmed sterile water
- Prescribed medication

1. Preparations

- Perform hand hygiene.
- Prepare medication and equipment.
- Check patient and medication as per Te Whatu Ora Waikato medicine policies.
- Identify the correct medication port (refer to diagram below).

- Fill each of the two luer-tip syringes with 5ml of sterile water to flush the tube before and after giving the medication.

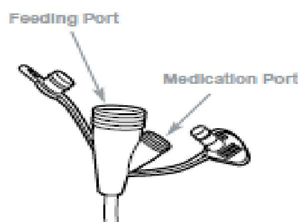


Figure 7

2. Giving medication

- Give medication 1-2 hours between feeds when possible.
- To prevent clogging and blockage of the tube, cautions when administering medication:
  - Do not mix two or more medications together.
  - Do not mix medication with formula.
  - Do not mix other medication with antacids, calcium or iron supplements.
  - Do not crush enteric coated or time released capsules.
- If infant is on continuous feeding, ‘pause’ the infusion pump.
- If on bolus feed, clamp the delivery tubing.
  - Open the identified medication port and flush the tube with 5ml of warmed sterile water.
  - Give the medication and flush the tube with the remaining 5ml of warmed sterile water.
  - Close the medication port and restart the feeding.

2.3 Potential complications

1. Gastrointestinal problems

- Reflux
- Diarrhoea may be caused by
  - Formula composition
  - New medication
  - Change in feeding routine
  - Rapid administration
  - Contaminated feed
  - Baby is unwell
- Nausea and vomiting

- Intra-abdominal leaks
- Peritonitis

  Abdominal distension

2. Stoma problems

- Fluid leakage and skin excoriation
- Cellulitis
- Dermatitis
- Ulceration
- Bleeding
- Hypergranulation
  - Granulation tissue usually occurs about 6 weeks post-surgery, and it may be caused by the tube moving too freely.
  - A large amount of granulation may result in leakage of gastric contents.

3. Device problems

- Tube blockage
  - Gastrostomy not flushed before and after feed
  - Formula left in the tube to curdle
  - Medication is mixed with formula
  - Residue of hardened stomach contents, medication and/or formula
- Tube displacement
- “Buried bumper” syndrome, hypergranulation of the site
- Spontaneous balloon deflation
- Build-up of gas
- Damage to the tube
- Leakage around the tube from the stoma leading to skin irritation around the site
- Leakage from the device

  Misidentification of ports

4. Other problems

- Dehydration
- Rapid weight gain
- Weight loss
- Pulmonary Aspiration

3 Evidence base

3.1 References

- Hamill, J. & Row, J. (2019). Gastrostomy. Starship Clinical Guidelines, retrieved from https://starship.org.nz/guidelines/gastrostomy/
- Kimberly Clarke Global Sale Inc. (2018). Mic-key low profile feeding tube. Retrieved from https://www.mic-key.com/life-with-mic-key/tube-care-usage
- Lippincott Procedures (2021) Enteral feeding, gastrostomy feeding button, maintenance and reinsertion, pediatric. Retrieved from https://procedures.lww.com/lnp/view.do?pId=1136969&hits=pediatric,gastrostomy&a=false&ad=false&q=gastrostomy%20paediatric
- Royal Children's Hospital Melbourne (2017). Gastrostomy- common problems. Retrieved from www.rch.org.au/clinicalguide.
- SHR Nursing Practice Committee (2017). Gastrostomy tube; Adult and paediatric: Replacement, removal, care of. Retrieved from https://www.saskatoonhealthregion.ca/about/NursingManual/1105.pdf

3.2 Associated Te Whatu Ora Waikato Documents

- Feeding equipment (Ref. 2894)
- Labelling, handling, storage, transport and administration of human milk in Newborn Intensive Care Unit (NICU) (Ref. 2771)
- Medicines management (Ref. 0138)