

Management of Gastroschisis in the Newborn Baby

Procedure Responsibilities and Authorisation

Department Responsible for Procedure	Newborn Intensive Care Unit
Document Facilitator Name	Natalie Ron, Miranda Bailey-Wild
Document Facilitator Title	Registrar/SMO
Document Owner Name	Jutta van den Boom
Document Owner Title	Head of Department, NICU
Target Audience	NICU staff, maternity staff
Disclaimer: This document has been developed by Te Whatu Ora Waikato specifically for its own use. Use of this document and any reliance on the information contained therein by any third party is at their own risk and Te Whatu Ora Waikato assumes no responsibility whatsoever.	

Procedure Review History

Version	Updated by	Date Updated	Summary of Changes

Management of Gastroschisis in the Newborn Baby

Contents

1	Overview	3
1.1	Purpose.....	3
1.2	Scope.....	3
1.3	Patient / client group	3
1.4	Exceptions / contraindications	3
1.5	Definitions and acronyms	3
2	Clinical management	4
2.1	Background.....	4
2.2	Management during birth.....	4
2.3	Initial management principles after birth should include:.....	4
2.4	Management in NICU	6
2.5	Closure.....	7
2.6	Feeding protocol	10
2.7	Potential complications	11
3	Discharge Criteria	12
4	Evidence base	12
4.1	Bibliography	12
4.2	Associated Te Whatu Ora Waikato Documents	12

Management of Gastroschisis in the Newborn Baby

1 Overview

1.1 Purpose

To have a standardised approach for patients admitted to NICU with gastroschisis, in particular:

- Initial management of herniated abdominal contents
- Approach to fluid management during stabilisation
- Approach to fluid management in ongoing preoperative phase

1.2 Scope

Te Whatu Ora Waikato staff working in NICU.

1.3 Patient / client group

All Babies born with gastroschisis

1.4 Exceptions / contraindications

Consider appropriate management in context of gestation and other associated anomalies.

1.5 Definitions and acronyms

BGL	Blood glucose
Gastroschisis	Defect of closure of abdominal wall (usually to the right side of the umbilical cord) externalising bowel contents Classified as simple vs complex Simple = bowel in good condition with no intestinal complications Complex = associated with congenital intestinal complications such as malrotation, perforation, atresia, ischaemia, necrosis
IUGR	Intrauterine Growth Restriction
NBM	Nil By Mouth
NG/OG	Naso-gastric/Oro-gastric tube
Omphalocele	Defect of closure of abdominal wall with bowel contents contained in a peri-umbilical membrane
SGA	Small for gestational age - definition
Silo	Plastic construction to protect bowel whilst allowing it to return to the abdomen over time using gravity = staged closure
TPN	Total Parenteral Nutrition

Management of Gastroschisis in the Newborn Baby

2 Clinical management

2.1 Background

The incidence of gastroschisis is 1:2000 – 1:2500 with rates increasing over time. Maori have higher rates than non-Maori.

Incidence increases with decreasing maternal age, maternal smoking or maternal infection

It is often diagnosed antenatally, on routine anatomy scans.

Associated congenital anomalies are rare.

Associated IUGR is common, but should not necessarily preclude investigation for SGA.

2.2 Management during birth

- Ideally the baby will labour and deliver vaginally but they are often IUGR/small for gestational age and need careful antenatal monitoring for foetal distress. If the foetal distress is severe enough the baby will be born by caesarean section.
- Support the bowel close to baby to minimise the risk of tension and associated injury as the baby is being born.
- The umbilical cord should be clamped further away from baby than usual as the cord itself is often enfolded in closure. A muka pito tie may be used in addition to the hospital clamp but should be kept outside of the covering dressing to avoid infection.
- After birth and clamping of umbilical cord, transfer baby immediately to transport resuscitaire and place baby onto a long sheet of cling film plastic wrap pre-prepared over the surface of the resuscitaire

2.3 Initial management principles after birth should include:

1. **Avoidance of hypothermia**
2. **Care of the exteriorised abdominal contents**
3. **Gastric decompression**
4. **Respiratory support**
5. **Fluid resuscitation**

1. Avoidance of hypothermia

- Assess temperature on arrival to NICU
- Risk of hypothermia is increased related to surface area of exposed bowel
- Use servo-temperature probe on resuscitaire

2. Care of the exteriorised abdominal contents

- Assess colour, inflammation, and size (dilatation) of bowel
- Use sterile gloves when handling bowel

Doc ID:	6464	Version:	01	Issue Date:	9 MAR 2023	Review Date:	9 MAR 2026
Facilitator Title:	Registrar			Department:	NICU		
IF THIS DOCUMENT IS PRINTED, IT IS VALID ONLY FOR THE DAY OF PRINTING							Page 4 of 12

Management of Gastroschisis in the Newborn Baby

- Exposed bowel should be supported in a “donut” made from glad-wrapped enclosed flannels which is placed around the umbilicus/bowel (see image below)
- Wrapped bowel should be supported close to the right of the umbilical cord to minimise tension and kinking of the bowel and its blood supply
- Wrapped plastic wrap from under baby around abdomen so that no bowel remains exposed to prevent dehydration of the bowel wall and membranes (see image below) Ensure the umbilical clamp is away from the bowel, and not causing pressure on the skin.
- Monitor for fluid on lateral aspects and back of plastic wrap



- **If there is any concern regarding viability of bowel (discolouration, evidence of perforation), call surgical registrar ASAP. Should the bowel be deemed dusky, place baby right laterally whilst awaiting surgical review.**

3. Gastric decompression

- With 8fr feeding tube aspirate stomach immediately and place on free drainage
- If the stomach is externalised the NG tube tip can be seen pushing into the stomach wall (pull it away from the wall). However it is important that the stomach is not overdistended; the air and stomach contents need to be removed.
- It is common for the stomach contents to be bile stained.

Doc ID:	6464	Version:	01	Issue Date:	9 MAR 2023	Review Date:	9 MAR 2026
Facilitator Title:	Registrar			Department:	NICU		
IF THIS DOCUMENT IS PRINTED, IT IS VALID ONLY FOR THE DAY OF PRINTING							Page 5 of 12

Management of Gastroschisis in the Newborn Baby

4. Respiratory support

- Avoid prolonged bag-mask/Neopuff supported ventilation to avoid gastric distension.
- If ongoing respiratory support is needed (e.g. CPAP), consider prophylactic/early intubation.
- Endotracheal intubation should be considered early in cases requiring prolonged respiratory support

5. Fluid resuscitation

- Commence IV fluids
 - Glucose 10% at 60ml/kg/day
 - Consider bolus of sodium chloride 0.9% at 10ml/kg/dose as required for poor perfusion
- Close monitoring of urine output

2.4 Management in NICU

- Contact paediatric surgical registrar (021 382 640) to inform of baby's birth.
- Insert peripheral IV for routine fluids, consider taking blood for crossmatch, CBC and culture, Gas for glucose
 - Upper limb IV access preferable.
 - If unable to gain peripheral IV access, Umbilical lines are acceptable
- Prophylactic Antibiotics (at discretion of surgical team)
 - [Amoxicillin - Clavulanic Acid for neonates](#) Ref 0582 / [Gentamicin for neonates](#) (Ref. 2923)
- NBM
 - Close monitoring of BGL as IUGR patients are at risk of hypoglycaemia
 - Consider central venous access +/- peripheral arterial line if time permits pre-operatively [Central Venous Access Device \(CVAD\) insertion, management and maintenance in NICU](#) (Ref. 2654)
 - Surgery should not be delayed for vascular access
 - Consult surgical team prior to accessing umbilical vessels

Doc ID:	6464	Version:	01	Issue Date:	9 MAR 2023	Review Date:	9 MAR 2026
Facilitator Title:	Registrar			Department:	NICU		
IF THIS DOCUMENT IS PRINTED, IT IS VALID ONLY FOR THE DAY OF PRINTING							Page 6 of 12

Management of Gastroschisis in the Newborn Baby

2.5 Closure

The paediatric surgical team will decide on the type of closure, based on condition of the bowel, size of the defect, and clinical status of the patient.

2.5.1 Primary closure of defect

- Can be surgical (in theatre) or “Sutureless” on NICU
- Bowel is reduced and defect closed

Primary Surgical Repair under GA

- Usually performed in theatre
- Bowel is reduced into abdomen and skin +/- fascia closed over defect

Primary “Sutureless” repair in NICU

- Bowel is reduced by surgeons at bedside with NICU support for pain relief and sedation
- Defect is closed using steristrips
- N.B. It is important to **notify theatre prior to reduction**, in case of life threatening abdominal compartment syndrome.

2.5.2 Formation of silo and secondary closure of defect

- Bowel is placed in a pre-formed Silo which is gradually reduced over period of days by surgical team
- Bowel can be inspected for perfusion through silo
- Pain relief will be required at initial placement of silo +/- PRN bolus on reduction
- Document clearly the state of bowel on daily review

2.5.3 Post-operative management

- Gastric decompression
 - Insert 8fr NG tube
 - 1-2 hourly aspirates + free drainage
- NBM
- Central venous access
 - If not done pre-operatively, should be placed in theatre
 - CVAD or surgically placed central line needed for adequate IV nutrition
 - Consider upper limb preferentially to lower limbs for CVAD placement

Doc ID:	6464	Version:	01	Issue Date:	9 MAR 2023	Review Date:	9 MAR 2026
Facilitator Title:	Registrar			Department:	NICU		
IF THIS DOCUMENT IS PRINTED, IT IS VALID ONLY FOR THE DAY OF PRINTING							Page 7 of 12

Management of Gastroschisis in the Newborn Baby

- Give IV nutrition See [Enteral Feeding Standardisation in Newborn Intensive Care Unit](#) (Ref. 6172)
- Monitor for signs of hypoperfusion of gut
- Maintain adequate Hydration
 - Monitor vital signs
 - HR, BP Peripheral temperature, capillary refill,
 - Regular blood gas to monitor for electrolyte imbalance and evidence of hypoperfusion
 - Q4-6h for 48h post op or more frequently as clinically indicated
 - lactate
 - Daily serum electrolytes
 - Some babies will require volume replacement hourly
 - Strict fluid balance
 - Monitor urine volume, gastric output, wound losses
 - Replacement of gastric losses >20ml/kg/day with sodium chloride 0.9% – assess every 4 hours
- Monitoring
 - Monitor for signs of abdominal compartment syndrome
 - decreased urine output, (<1ml/kg/h)
 - decreased capillary refill in distal extremities,
 - abdominal distension and tenderness,
 - increased ventilator pressures compared with pre-reduction pressures,
 - increased pain relief requirement
 - Surgical team should be notified immediately if any concerns of above
 - Low threshold to return to theatre for laparotomy if abdominal compartment syndrome suspected
- Ventilation
 - Requirements to be assessed by NICU team
 - Patients with silos may not require mechanical ventilation
- Urinary catheter
 - Urinary retention is common, especially with concomitant use of opiates
- Antibiotic use
 - At discretion of paediatric surgeon
 - Recommend discontinuation at 24 hours post closure in absence of sepsis or clinical instability

Doc ID:	6464	Version:	01	Issue Date:	9 MAR 2023	Review Date:	9 MAR 2026
Facilitator Title:	Registrar			Department:	NICU		
IF THIS DOCUMENT IS PRINTED, IT IS VALID ONLY FOR THE DAY OF PRINTING							Page 8 of 12

Management of Gastroschisis in the Newborn Baby

- Pain assessment and management [Pain Management of Infants in NICU](#) (Ref. 3712)
 - IV paracetamol 15mg/kg/dose Q6H [Paracetamol for neonates](#) (Ref. 2949)
 - IV morphine/fentanyl infusion +/- bolus [Morphine for neonates](#) (Ref. 2940) / [Fentanyl for neonates](#) (Ref. 2916)
- Medications
 - Must be diluted as per high risk NEC protocol, when surgical team agree for oral intake
- Dressing
 - As per operative note
 - Monitor for colour and discharge, or any evidence of wound break down
 - *N.B. Gastroschisis wounds have high risk of infection, and any erythema should be monitored closely and reported early*
- Feeding
 - As per standardised feeding protocol (see below)
 - Routine weights

2.5.4 Management of babies following pre-formed silo application

- Assess appropriateness of pain relief
- Change and weigh gauze around silo regularly and replace losses accordingly
- Regularly assess bowel perfusion and notify surgical team of any change in colour
 - Normal bowel should look pink
 - If grey, purple or black looking bowel – consider vascular compromise --> needs surgical review immediately
- Ensure umbilical cord remains moist (wrap in 0.9% saline soaked gauze)
- Ensure silo remains vertical at all times
- Patient *must* remain NBM with NG on free drainage
 - Replace NG losses as above

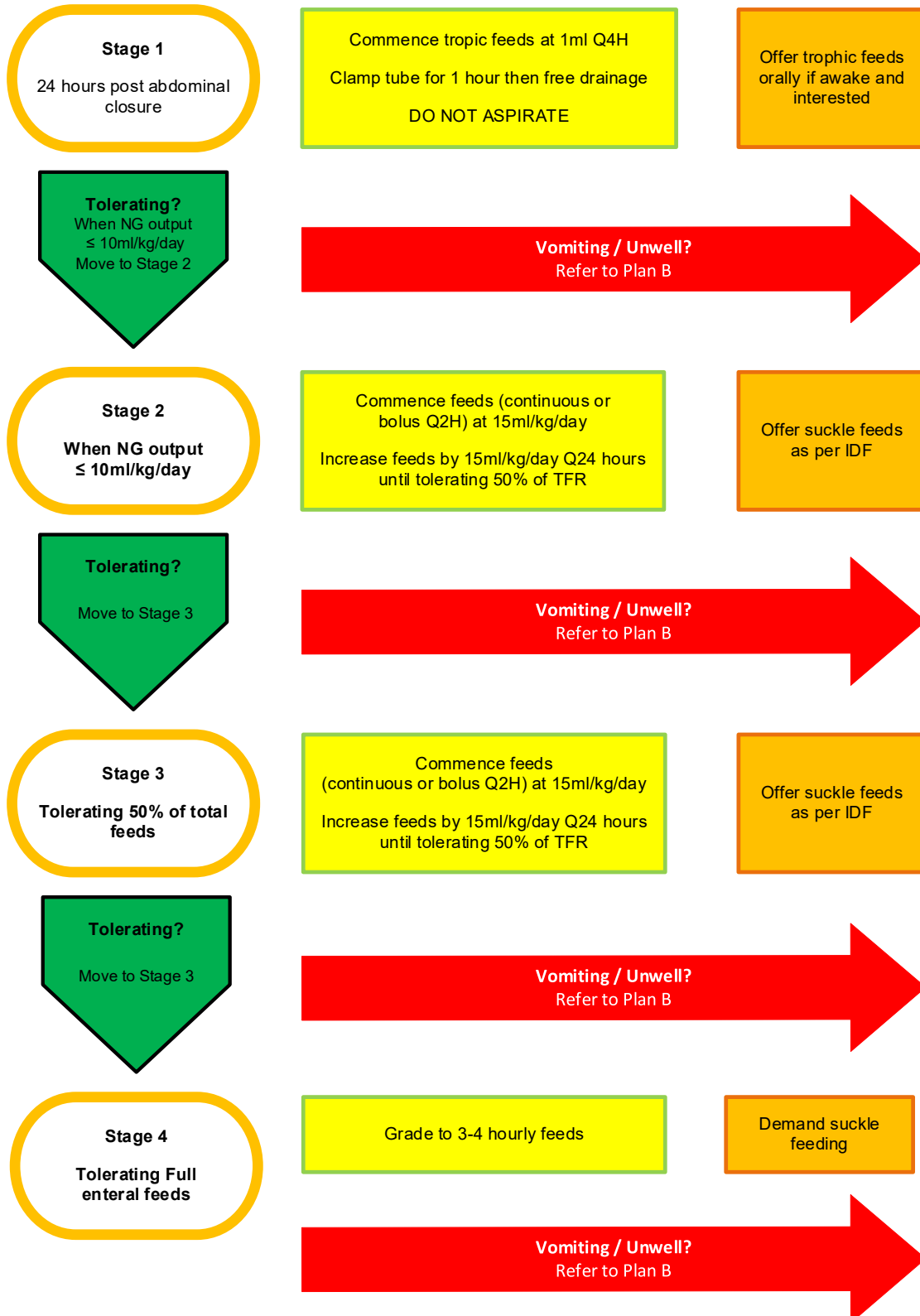
Doc ID:	6464	Version:	01	Issue Date:	9 MAR 2023	Review Date:	9 MAR 2026
Facilitator Title:	Registrar			Department:	NICU		
IF THIS DOCUMENT IS PRINTED, IT IS VALID ONLY FOR THE DAY OF PRINTING							Page 9 of 12

Management of Gastroschisis in the Newborn Baby

2.6 Feeding protocol

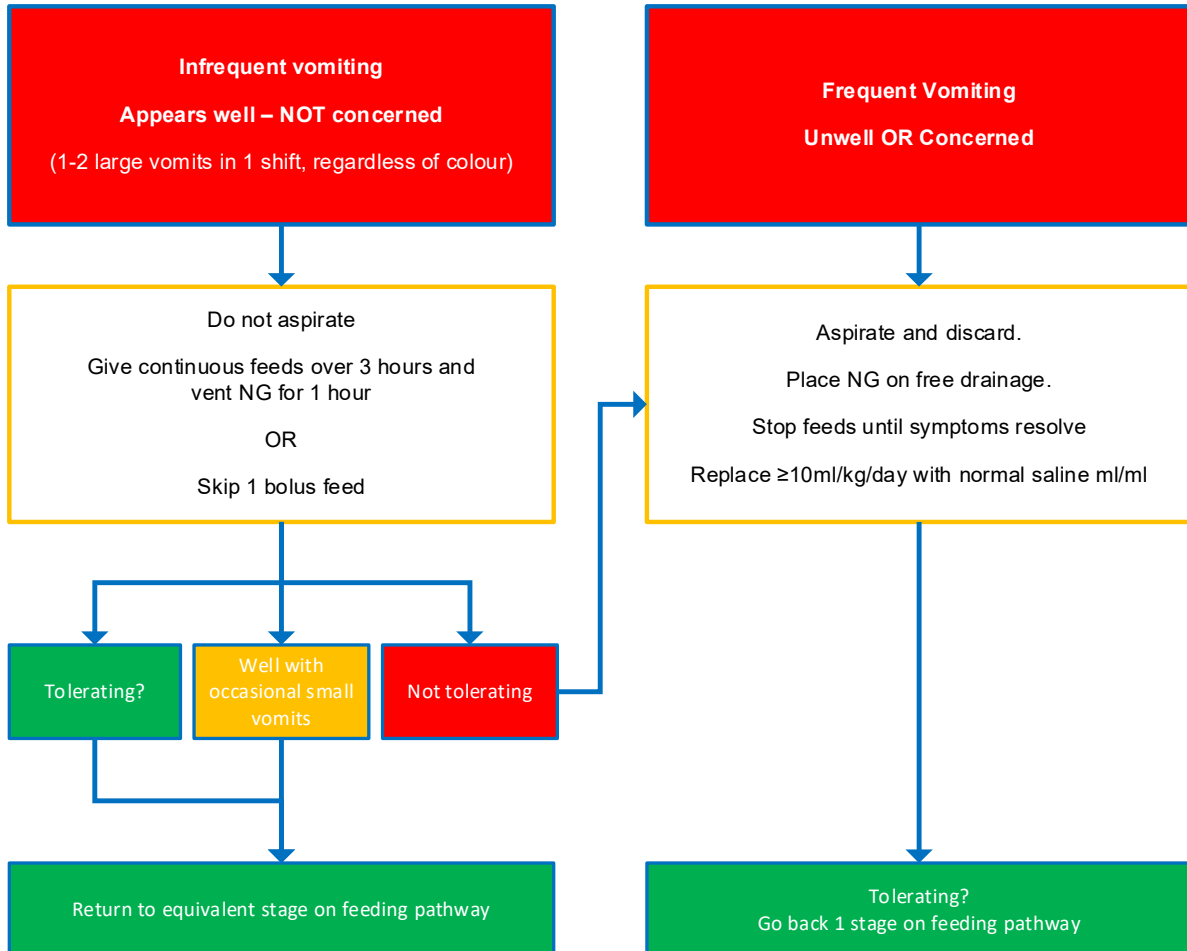
Adapted from "Westmead Gastroschisis feeding protocol"

PART A - FEEDING PATHWAY



Management of Gastroschisis in the Newborn Baby

PART B - FEEDING PATHWAY



2.7 Potential complications

- Damage to externalised abdominal contents
- Abdominal compartment syndrome
- Ileus or Intestinal obstruction
- Poor weight gain with feeding difficulties

Management of Gastroschisis in the Newborn Baby

3 Discharge Criteria

- Infants should be considered safe for discharge following acceptable weight gain on suckle feeding, without need for parental nutrition.
- Follow up should be arranged in consultation with the surgical team
- Consider transfer to surgical paediatric ward if stable and establishing enteral feeds

4 Evidence base

4.1 Bibliography

- Gastroschisis Clinical Guideline. Child and Adolescent Health Service, Western Australia. Review December 2020
- Gastroschisis Clinical Guideline. Children's Hospital of Orange County
- Gastroschisis: Management prior to transfer to surgical centre. National Clinical Guideline, Ireland. Published September 2020
- Management of Gastroschisis. Newborn Critical Care Centre (NICCC). Updated November 2019
- Srivastava et al. Rising incidence of Gastroschisis and exomphalos in New Zealand. Journal Paediatric Surgery. 2009;44(3)551/555
- Surgery – Management of abdominal wall defects in the neonate. Starship Childrens Hospital. Published April 2005
- Trust Guideline for the Management of Gastroschisis. Norfolk and Norwich University Hospitals. Updated March 2021

4.2 Associated Te Whatu Ora Waikato Documents

- [Amoxicillin - Clavulanic Acid for neonates](#) (Ref. 0582)
- [Central Venous Access Device \(CVAD\) insertion, management and maintenance in NICU](#) (Ref. 2654)
- [Enteral Feeding Standardisation in Newborn Intensive Care Unit](#) (Ref. 6172)
- [Fentanyl for neonates](#) (Ref. 2916)
- [Gentamicin for neonates](#) (Ref. 2923)
- [Morphine for neonates](#) (Ref. 2940)
- [Pain Management of Infants in NICU](#) (Ref. 3712)
- [Paracetamol for neonates](#) (Ref. 2949)

Doc ID:	6464	Version:	01	Issue Date:	9 MAR 2023	Review Date:	9 MAR 2026
Facilitator Title:	Registrar			Department:	NICU		
IF THIS DOCUMENT IS PRINTED, IT IS VALID ONLY FOR THE DAY OF PRINTING							Page 12 of 12