ABDOMINAL WALL DEFECTS IN NEONATES: INITIAL, PRE AND POST-OPERATIVE MANAGEMENT - GCNC - CHW

PRACTICE GUIDELINE ©

DOCUMENT SUMMARY/KEY POINTS

- Neonates with abdominal wall defects will require surgery to amend the defect.
  - The two most common abdominal wall defects are gastroschisis and omphalocele.
  - Pre-operative management for gastroschisis and omphalocele include bowel stabilisation, thermoregulation, gastric decompression, fluid and electrolyte balance, acid-base balance and respiratory support.
  - Post-operative management for gastroschisis and omphalocele include positioning, pain management, respiratory support, acid-base balance, fluid and electrolyte balance, intra-abdominal pressure monitoring, management of gastric losses, monitoring of urinary output and nutritional support.
  - Ward reduction of gastroschisis can occur under favourable circumstances.
  - Insertion of a silo is recommended for staged closures if primary closure is not possible.

Approved by:	SCHN Policy, Procedure and Guideline Committee	
Date Effective:	1st May 2023	**Review Period**: 3 years
Team Leader:	Clinical Nurse Consultant	**Area/Dept**: GCNC - CHW

CHANGE SUMMARY

- Fluid and electrolyte balance section updated
- Equipment needed for Silo reduction updated
- Reference list updated
- **12//9/23**- Minor review – Photo of a donut dressing added.

READ ACKNOWLEDGEMENT

- All clinical staff working in Grace Centre for newborn Care. Copy of the document is kept in the NICU at Westmead Hospital.
- Read Acknowledge Only – all staff emailed the notice of the new document and expected to read and be aware of practices and changes

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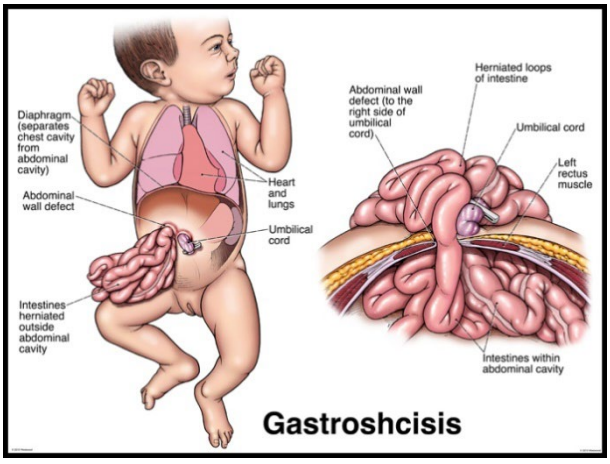
Introduction

Neonates with abdominal wall defects require surgery to amend the defect. The two most common abdominal wall defects are gastroschisis and omphalocele[1]. Abdominal wall defects occur in utero when the abdominal wall muscles do not form correctly[1]. An incomplete abdominal wall can result in the protrusion of the internal organs either to the side of the umbilicus (gastroschisis) or into the umbilical cord (omphalocele)[2,3]. Evaluation of prenatal or postnatal outcome is based principally on bowel development during pregnancy[3]. Evidence based management of the late gestation patient antenatally diagnosed with gastroschisis is associated with excellent outcomes[4,5].

Part A: Gastroschisis

Definition

Gastroschisis is the herniation of abdominal contents through an abdominal wall defect, usually to the right of umbilicus[2,3]. Abdominal contents that are herniated through the abdominal wall include variable amounts of intestines and occasionally parts of other abdominal organs. These organs have no covering membrane or sac. Gastroschisis is classified as simple or complex depending on the presence of bowel perforation, atresia or stenosis. Therefore, this should be regarded as a surgical emergency.



Timing and Mode of delivery[6]

Approximately 30 to 40% of pregnancies with gastroschisis go into spontaneous preterm labour and delivery, compared to 6% in the controls. It has been observed that spontaneous preterm labour is associated with more severely damaged bowel loops, bowel occlusion, and stained amniotic fluid[7].

While the goal of delivery of the newborn with gastroschisis is to optimise their outcome by minimising trauma to the exposed gastrointestinal contents. Many babies can be safely born via vaginal delivery, however, it is not uncommon for the mother to go into premature labour. Mostly, babies are delivered at around 37-38/40 weeks, generally not delivered post term

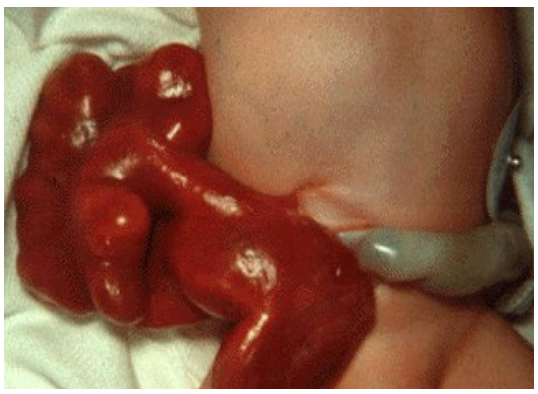
due to increased risk to the baby. The mode of delivery is best determined by the obstetrician in consultation with the mother, midwives, surgeons and occasionally the neonatologist.

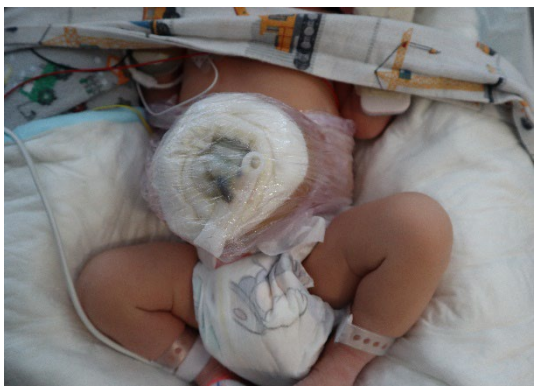
Initial management in the birth unit

- Prepare as for anticipated high risk birth. The neonatal teams at Westmead and Grace Centre for Newborn Intensive Care are notified of the impending birth by the shared page.
- Manage airway, breathing and cardiovascular status as per ARC guidelines.
- Should airway support be required endotracheal intubation and ventilation is preferable to prolonged mask ventilation/nasal CPAP in order to minimise gut distension.
- Once the cardio-respiratory status has been stabilized, quickly inspect the bowel correcting any obvious twists on its pedicle or acute discoloration due to ischaemia. The bowel should then be positioned centrally over the abdomen and wrapped as described below. Insert an 8FG nasogastric tube and aspirate the stomach. Leave the end open on free drainage and measure output as the patient is on a strict fluid balance.
- Ensure adequate thermal control by using an overhead warmer and drying the infant as soon as possible.

Management of Exposed Bowel[6]

- Following assessment, the exposed bowel should be wrapped with clingfilm e.g. Gladwrap® (or any equivalent, transparent, latex free alternative) for protection and to minimise fluid and heat loss
- The wrap does not need to be sterile
- Slide large piece of clingfilm under the baby's buttocks and back
- Place exposed organs on baby's abdomen using sterile latex-free gloves
- Wrap clingfilm gently around the abdomen and exposed organs. Ensure the intestine is positioned to minimise tension and optimise blood supply and place the cling wrap covered roll as a 'donut' to support the intestine resting on the abdominal wall as highlighted in the figure below.





- Ensure bowel edges are not exposed to drying air
- Avoid compressing the bowel, it should remain mobile but protected
- Monitor the bowel every 15 minutes and report duskiness or blanching to the surgical and neonatal consultant/fellow/clinical NUM
- With senior input the bowel wrapping may require release, removal and rewrapping if compression, kinking or twisting is suspected
- Support the intestines to prevent occlusion of the blood supply where the bowel exits the defect in the abdominal wall
- If necessary support the exposed intestines with your hands
- Where possible nurse the neonate on their right side, with the wrapped bowel supported perpendicular to the abdominal wall using a rolled towel or equivalent

Stabilization

- Upon transfer to the Westmead NICU ensure the airway, breathing and any cardiovascular instability is managed as per standard practice
- Ensure the protruded abdominal contents remain wrapped and supported as described above
- Reassess the bowel status regularly to ensure the bowel remains supported and uncompromised
- Establish vascular access using a peripheral cannula in the upper limbs.
- Arterial access is not required at this stage unless there is significant respiratory or circulatory compromise. Collect blood sample for baseline gas, electrolytes, glucose and culture when IV inserted
- Commence IV fluids and monitor fluid status carefully as insensible fluid losses will be excessively high but bowel oedema is to be avoided
- Occasionally fluid through an IV bolus boluses maybe required if there are excessive gastric fluid losses.
- Antibiotics: Tazobactam/Piperacillin may be required.
- Ensure continued thermal control
- Vitamin K administered prior to transfer
- Complete relevant Blue Book documentation

Transfer from Westmead to GCNC at CHW

- After initial stabilisation the Westmead staff contacts the nurse in charge at the GCNC NICU to notify them of impending transfer (team leader, NUM and medical staff)

- Adequate staff from Westmead are required for the transfer (porters, nursing, medical staff)
- The transfer equipment and battery life must be checked and adequate for heating during transfer, with enough gas available for the transfer and suction equipment in working order
- Collect additional transfer equipment (transfer pack)
- Transfer infant using specialized transfer equipment (Incubator, heated bed and shuttle)
- The parents are notified of the transfer, and are encouraged to accompany the team during the transfer
- Handover care to the GCNC nursing and medical team occurs on arrival in Grace.
- Staff check that there are identification bands on the baby and that vitamin K has been administered and documented.
- The IV cannula site is checked for patency and fluids are running to maintain blood sugar levels and hydration.
- Maternal blood should be provided for cross match if required and there are two signatures on any blood collection form
- Check the infant's temperature and adjust the heating as required.
- Check to see if a birth weight was recorded or attended.
- A copy of the Westmead medication chart should be part of the documentation.
- Ensure the parents are offered a chair and informed when the baby has been stabilized.
- Notify the surgical team of the baby's arrival and location.
- Identify equipment that is to be returned to Westmead NICU.

Pre-operative management in GCNC

Bowel stabilisation

- The external bowel is stabilised in the midline of the infant and observed to ensure adequate perfusion of the gut and the patient is positioned on their side to prevent pressure on mesenteric vessels[5].
- Monitor bowel colour and report duskiness and blanching to the neonatal consultant/fellow/clinical NUM and surgical team for review.

Thermoregulation

Significant heat is lost through the external bowel[4]. In order to maintain thermoregulation ensure:

- The bowel is wrapped in clear plastic cling film in order to minimise insensible water losses by limiting heat and evaporative losses[8].
- The infant is nursed under a radiant warmer with servo control to prevent overheating[4].

Gastric decompression

- The infant is kept nil by mouth.
- A wide bore (8FG) intragastric tube is required to decompress the.
- Gastric decompression reduces the risk of gastric distension and respiratory compromise.
- The intragastric tube is left on free drainage and aspirated 2nd hourly.

Fluid and electrolyte balance

- Large fluid and electrolyte losses occur from the external bowel and gastric aspirates[8-9].
- Intravenous fluids of N/4 + 10% glucose are commenced at 90mL/kg/day. Fluid intake of 90ml/kg/day is not the standard on first day of life. They usually are commenced on 80ml/kg and are their fluid balanced is assessed depending on gastric output/ and insensible water losses
- Fluid deficits may lead to decreased tissue perfusion and the development of metabolic acidosis.
- Fluid overload may lead to bowel wall oedema and may make reduction more difficult.
- Maintaining fluid and electrolyte balance preserves bowel wall perfusion and function.

Acid-base balance

- Post reduction there is a risk of bowel ischaemia as the bowel is gently reduced into the abdomen. There is a risk of malrotation
- Blood gases including lactate are attended at least 4th hourly on the first night post reduction and any acidosis or lactate of more than 3mmol/L reported to the clinical NUM/neonatologist/fellow and surgical team.

Respiratory support

- Prior to theatre or post reduction there may be an indication for respiratory support with mechanical ventilation. This may be due to increased intra-abdominal pressure leading to respiratory embarrassment or due to prematurity or narcotic induced apnoea.
- See the Respiratory Guideline for the care of a ventilated infant.

Preparation for surgery

- Prepare the infant for surgery as per Transfer of a Neonate to Operating Theatre and Other Hospital Investigative Departments Clinical Practice Guideline.
- The majority of infants with gastroschisis will have either a primary or staged repair undertaken in the Operating Theatre. Occasionally there may be an opportunity to perform the operation in the NICU. The decision for the same is made by the surgical team in consultation with the neonatal team. The procedure for a reduction or silo in the NICU is as follows.

Primary reduction or insertion of a silo for gastroschisis in the NICU

Criteria

Under favourable circumstances the neonatologist and surgeon may agree that an infant meets the medical and surgical criteria for the safe reduction of a gastroschisis in the newborn intensive care unit. The timing and location of the procedure is negotiated with the clinical nurse manager to ensure adequate staff are available.

Medical criteria:

- Respiratory support available
- Narcotic analgesia/sedation
- Intravenous access gained and intravenous fluids in progress
- Cardiorespiratory and circulatory stability
- Birth weight of >2000g

Surgical criteria:

- Informed parental consent
- Limited thickening or matting of bowel
- Minimal viscero-abdominal disproportion
- No intestinal atresia
- No intestinal ischaemia
- No adhesions to abdominal wall
- A mesenteric base that is not too narrow
- Little or no fibrous peel

Pain management

- Administration of IV Paracetamol a minimum 10 minutes prior to commencement
- Baseline pain score assessment documented
- Background morphine infusion is commenced
- Neonatal registrar on standby to order a morphine bolus if indicated

Equipment needed

- **Procedure trolley**
- Sterile drape
- Sterile gown
- Sterile gloves
- **Tegaderm® (large)**
- Bentec Silo may be required
- Steristrips ®(wide)
- Silk suture to reduce length of umbilical cord

- Sterile scissors
- Absorbable suture of surgeon's choice
- Prep solution (dilute betadine – 50% mixed with normal saline)

Procedure

- In order for this procedure to occur safely on the neonatal unit the following staff must be assembled in order to support the baby adequately throughout the procedure:
  - Nurse supporting the baby
  - Clinical NUM or ICU Access
  - Surgeon and fellow/registrar performing the procedure
  - Neonatologist or fellow and the NICU registrar.
- Baseline observations are recorded and a baseline blood gas should be documented prior to commencement.
- Pre medication is given to the infant.
- Ward reduction pack set up at the bedspace.
- The nurse looking after the infant is at the head of the bed to provide support to the infant.
- Nurse in charge/clinical access nurse and NICU JMO in the vicinity of the bedspace.
- Surgeons to commence reduction.
- If ward reduction is successful a blood gas is attended immediately after reduction and 2 hours post procedure.
- Insert IDC to monitor bladder pressure as requested by surgeon in charge of care
- Attempted ward reduction is abandoned in favour of an operative reduction or the insertion of a silo if the ward reduction is deemed difficult or has not been successfully accomplished within 30 minutes or the reduction results in pain or cardiorespiratory compromise or extreme distress in the infant.

Post-operative management

On return to the NICU from the Operating Theatre the infant will be intubated and ventilated and managed according to the Respiratory Management in the Neonate.

Position

- Nurse the infant in a supine position.

Pain management

- A morphine infusion remains and the dose maybe titrated according to the pain score algorithm, or changed to fentanyl as is often the case if escalating MPAT scores

- In some infants a wound analgesia catheter maybe in-situ with a Bupivacaine infusion. The pain team are to be notified for information.
- Pain assessment scores are to be conducted every 2 hours in the immediate post-operative periods for the first 24 hours.
- Then every 4 hours for the next 48 hours and continue as long as analgesia is being used for pain relief.
- Adjust analgesia according to pain assessment scores. Refer to Pain Management in Newborn Infants Clinical Practice Guidelines.

Wound Management (Primary Closure)

- The abdominal wound is assessed every four hours for any swelling, redness or leaking and the sutures are intact.
- The abdomen maybe *tense* and *full* following a primary reduction and closure.

Wound Management (Staged Silo Closure)

- The silo will need to be supported in a vertical position.
- Bactigras and gauze is applied to the base of the silo to prevent infection and promote skin integrity.
- The silo will be reduced every 12-24 hours by the surgical team. Adequate pain relief will be provided prior to bowel reduction.
- Inform the surgical team if there is any discoloration in the bowel.

Respiratory support

Observe for respiratory compromise due to increased intra-abdominal pressure causing increased pressure on the diaphragm.

Acid-base balance

Post reduction there is a risk of bowel ischaemia as the bowel is gently reduced into the abdomen. There is a risk of malrotation to occur.

- Blood gases including lactate are attended at 4-6hour interval. Blood gases are done at frequent interval, if Bowel is looking dusky and any issues with ventilation due to tight abdomen closure post reduction.
- Attend regular blood gases to monitor for metabolic acidosis. Any acidosis or lactate 3mmol/L reported to the clinical NUM/neonatologist/fellow and surgical team.

Fluid and electrolyte balance

- Surgery during the neonatal period can further disturb fluid and electrolyte balance[9].
- High fluid losses are likely and a strict fluid balance chart should be maintained.
- The patient should be nursed on a bluey to capture leaking from the abdomen, and to assist in strict fluid balance chart recording.
- Attend regular blood gases or EUC to monitor for electrolyte imbalances.

Intra-abdominal pressure monitoring

- Observe the infant for development of abdominal compartment syndrome.
- Signs of increased intra-abdominal pressure include:
  - Rising lactate
  - Increase in bladder pressure
  - Increase in ventilatory support.
  - Tense and possibly tender abdomen.
  - Discolouration of abdominal wall and lower limbs.
  - Increase in pain relief.
  - Hypotension requiring inotropic support.
  - Decreased or absent urine output.
- To monitor intra-abdominal pressure refer to Bladder Pressure Monitoring Practice Guideline.

Gastric Losses

- Continue with a wide bore (8FG) intragastric tube on free drainage with frequency of aspirations as per surgeons, a minimum of 4hours is recommended.
- When gastric losses are >20mL/kg/day, a sample should be sent for electrolyte analysis and intravenous replacement fluids are commenced. (Just a guide, losses over 20ml/kg can be replaced, or TFR will be increased to provide more nutrition as opposed to sodium if electrolytes are within range). The recommendation for replacements is 4houry, to prevent the infant from getting into low intravascular volume status. The ml for ml is an exception and directed by the surgeon.

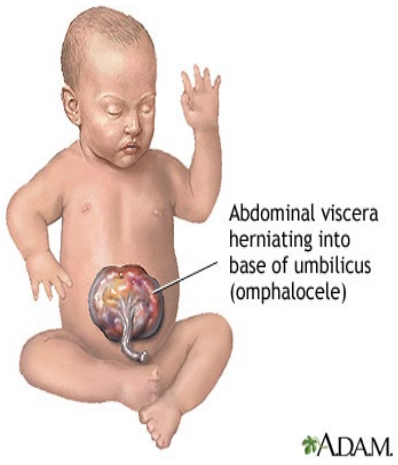
Urinary output

- Increases in intra-abdominal pressures may lead to a compromise in renal blood flow[2].
- A decrease in urine output to less than 1mL/kg may be due to a decrease in urine production or bladder distension.
- Insert an indwelling urinary catheter to relieve bladder distension and to allow a more accurate measurement of urine output.

Part B: Omphalocele

Definition

Omphalocele is a midline defect of the anterior abdominal wall that results in the herniation of abdominal contents into a membrane-covered sac[2]. The defect can be variable in size. The membrane covered sac consists of three layers. The inner layer consists of peritoneum, the outer later consists of amnion and the middle layer consists of Wharton's jelly[8]. Herniated abdominal contents include variable amounts of intestine, often parts of the liver and occasionally other organs[8]. The defect may be centred in the upper, mid or lower abdomen and the size and location of the defect have important implications for management. Unlike gastroschisis omphalocele is associated with genetic abnormalities and other congenital anomalies. These include Trisomy 13, Trisomy 18 or Beckwith-Wiedemann syndrome, and congenital heart defects[1]. In case of giant omphalocele, generally caesarean-section is recommended due to risk of rupture or bleeding from liver.



Pre-operative management

Protecting the herniated viscera

- Position the infant on their back with support of the sac to avoid vascular decompression[4].
- Whilst providing developmentally supportive interaction there should be a conscious effort to minimize over handling of the infant. The goal is to provide comfort but not to interfere with the integrity of the herniated sac. Cuddles may occur with the defect supported.

Mega Omphalocele

- The management of mega omphalocele requires significant support and guidance from the surgical team pre-operatively to preserve and protect the defect. Each case of mega omphalocele is different and managed on a case by case basis.
- The care of these defects may require the application of a vacuum dressing[10], the formation of a silo in the figure below, and in some cases the defect may not be able to be repaired in the newborn period. In some cases, delayed epithelialisation is employed and fascial closure is achieved when the baby is older. In these cases the defect is dressed with an antimicrobial dressing (e.g.Acticoat) until full epithelialisation of the sac occurs. The defect may be painted with silver dioxide or saline to promote epithelialisation[11,12].
- Supportive positioning of these patients in side-lying position is imperative to maintain adequate ventilation and perfusion. An air mattress should be provided to minimise the risk of developing a pressure injury.
- Heavy sedation may be required if haemodynamic stability is unable to be achieved.
- Consideration of insertion of a central line for parental nutrition should be discussed with the family early.

Thermoregulation

Significant heat is lost through the herniated viscera[4]. If the sac is intact, then thermoregulation is not a much of an issue. In order to maintain thermoregulation:

- The herniated viscera should be covered with a clear plastic cling film in order to minimise insensible water losses by limiting heat and evaporative losses[8].
- Nurse the infant under a radiant warmer[4].

Respiratory support

- Refer the Respiratory Guideline for the care of a ventilated infant.
- Giant omphalocele babies have pulmonary hypoplasia and pulmonary hypertension due to lack of diaphragm.
- Prior to theatre or post reduction there may be an indication for respiratory support with mechanical ventilation. This may be due to increased intra-abdominal pressure leading to respiratory embarrassment or due to prematurity or narcotic induced apnoea.

Gastric decompression

- The infant is kept nil by mouth.
- Insertion of a wide bore (8FG) intragastric tube is required for gastric decompression[1].
- Gastric decompression reduces the risk of gastric distension and respiratory distress[2].
- The intragastric tube is to be left on free drainage with a minimum of 4th hourly aspirates.

Fluid and electrolyte balance

- Fluid and electrolyte losses are increased in an infant with omphalocele, with greater losses occurring when the membranous sac has ruptured[4,9].
- Intravenous fluids of N/4 + 10% Glucose are commenced at 60mL/kg/day.
- Careful fluid and electrolyte balance is required to ensure adequate hydration without oedema.
- Fluid deficits may lead to decreased tissue perfusion and the development of metabolic acidosis.
- Maintaining fluid and electrolyte balance preserves bowel wall perfusion.

Blood glucose monitoring

- 2nd hourly blood glucose monitoring is required if the infant has suspected Beckwith-Wiedemann syndrome. If BSL low then measure hourly until stable.
- Frequency can be decreased when blood glucose levels have stabilized.

Preparation for surgery

Prepare the infant for surgery as per the Transfer of a Neonate to Operating Theatre and Other Hospital Investigative Departments Clinical Practice Guideline.

Post-operative management

Position

Nurse the infant in a supine position. If the closure is only partial. Herniated bowel/liver will need to be supported when the infant needs to change position to prevent pressure sores).

- The use of a nest to support the supine position with a gel head pillow to ensure no pressure points occur.
- Two nurses or one nurse and parent can support the infant and the defect during turning and re-positioning.

Pain management

- Pain scores are recorded every 2 hours in the immediate post-operative 24 hours.
- Then every 4 hours for the next 48 hours and continue as long as analgesia is being used.
- Adjust analgesia according to pain assessment scores. Refer to Pain Management in Newborn Infants Clinical Practice Guidelines.

Wound Management

- The goal is to protect the viscera from rupturing through protection until the contents have settled into the abdomen and the size has been reduced to enable a surgical closure.

- Several methods maybe used by the specific surgeon and will be monitored by the surgical team:
  - The viscera is regularly painted with normal saline to enable a crust to form.
  - The defect is dressed with Acticoat or Mepilex Ag and a firm dressing applied.
  - The defect is painted and a vacuum dressing applied.
  - A silo is inserted in the operating room to protect the potential or ruptured sac.
- The nurses' responsibility is to ensure the wound remains intact and any traction avoided through support aids such as a 'doughnut' ring of combine rolls.

Acid-base balance

- Attend regular blood gases to monitor for metabolic acidosis.
- Monitor lactate.

Fluid and electrolyte balance

- Surgery during the neonatal period can further disturb fluid and electrolyte balance[4].
- Attend regular blood gases or EUC to monitor for electrolyte imbalances.

Intra-abdominal pressure monitoring

- Observe the infant for development of abdominal compartment syndrome.
- Signs of increased intra-abdominal pressure include:
  - Increase in ventilatory support.
  - Increasing lactate
  - Tense and possibly tender abdomen.
  - Discolouration of abdominal wall and lower limbs.
  - Increase in pain scores and medication requirement.
  - Progressive worsening of metabolic acidosis and or respiratory acidosis, high lactate levels.
  - Hypotension requiring inotropic support.
  - Decreased or absent urine output.
- To monitor intra-abdominal pressure refer to Bladder Pressure Monitoring in Neonates.

Gastric Losses

- Continue with a wide bore (FG8) intragastric tube on free drainage with frequency of aspirations as per surgeons.
- When gastric losses are >20mls/kg/day, a sample should be sent for electrolyte analysis.
- Intravenous replacement fluids of 0.9% NaCl should be commenced with ml for ml replacement, if gastric losses are >20ml/kg in the past 24hrs. This should be calculated at 4th hourly intervals. Any volume greater than this should be replaced over 4 hours.

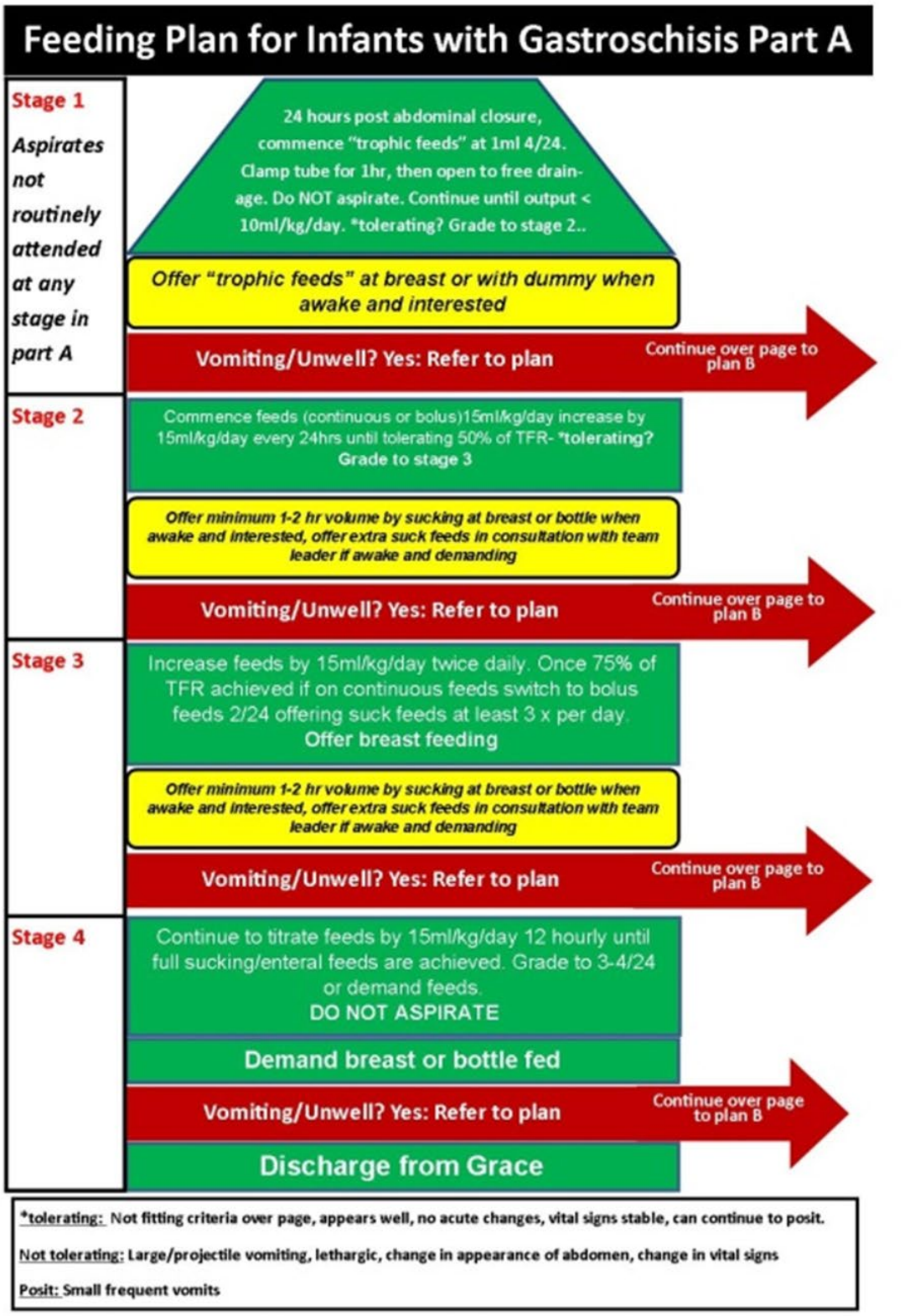
- ***E.g. (20mls x patients weight) ÷ 6 = the acceptable volume of losses per 4hr interval. (20mls x 3kg) ÷6 = 10mls. If the gastric losses were 16mls for the past 4hrs, replace 6mls over 4 hours = 1.5ml/hr of 0.9% NaCl.***
- Gastric aspirates and gastric residuals are also commonly relied upon as indicators of feed readiness and feed tolerance; however, there is no clinical description or guideline of what defines tolerance or intolerance using these methods[9-11].
- If gastric losses change from clear to green, then surgical review is necessary considering the risk of malrotation.

Urinary output

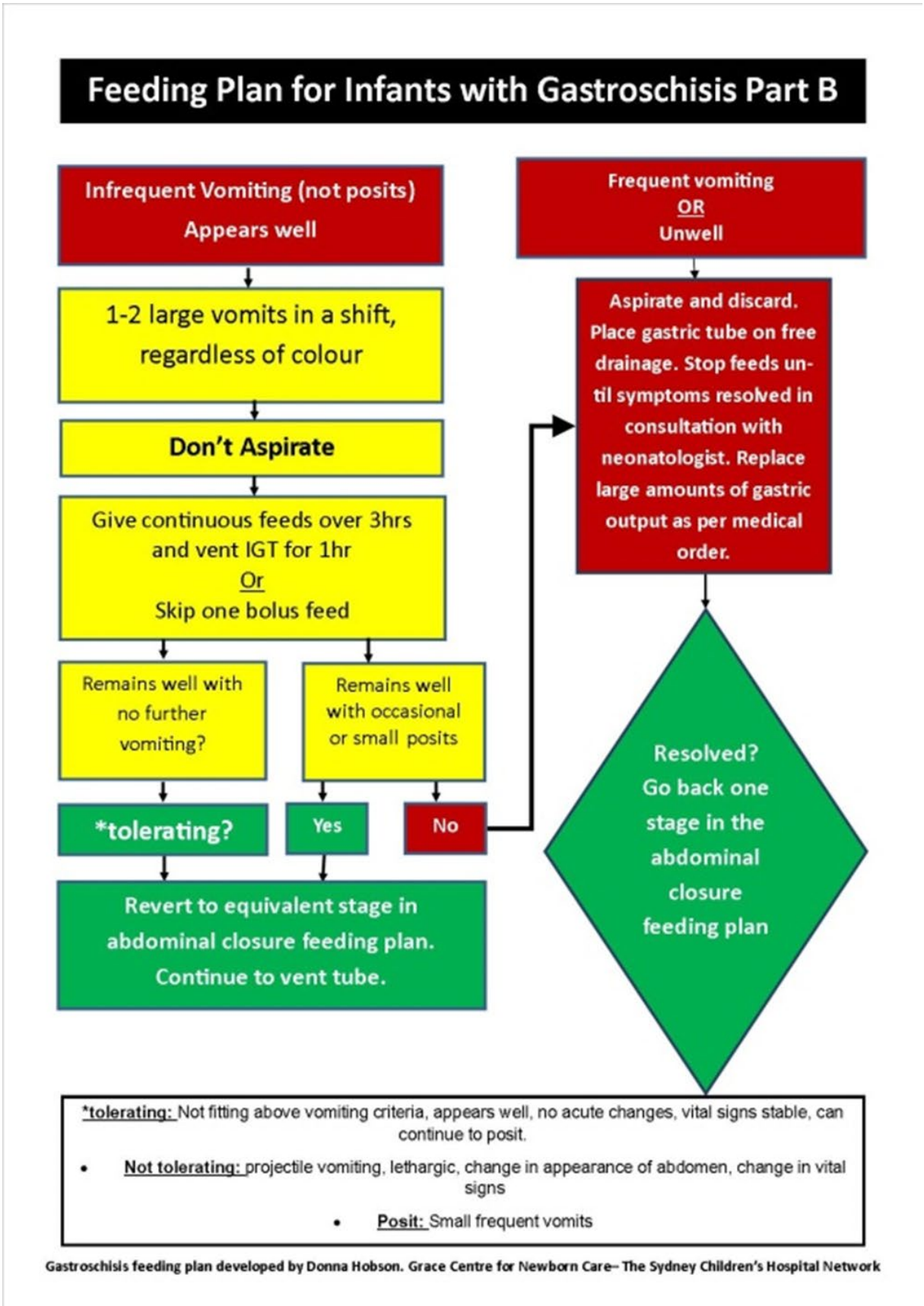
- Increases in intra-abdominal pressures may lead to a compromise in renal blood flow[2].
- A decrease in urine output to less than 1ml/kg/ hour may be due to a decrease in urine production or bladder distension. In the event of decreased urine output, the patient should be reviewed by a Medical Officer or Nurse Practitioner.
- Insertion of an indwelling urinary catheter may be needed to relieve bladder distension and to allow a more accurate measurement of urine output.

Feeding Infants with congenital abdominal defects

- Typically infants with congenital wall abnormalities have significant morbidity associated with difficulties in commencing and progressing enteral feeds[13,14] .this is not necessarily true in omphalocele but more true in gastroschisis The delay in the establishment of enteral feeds contributes to lengthy requirements for central venous access, dependence on total parenteral nutrition (TPN), small bowel bacterial overgrowth (SBBO), increased risk of sepsis and TPN related cholestasis resulting in a prolonged length of hospital stay, sometimes months.
- Inconsistencies in feeding management when introducing and increasing feeds for infants with gastroschisis can contribute to their extended length of stay (LOS)[15]. Possible reasons for inconsistencies include practice grounded in tradition, personal opinion and past experiences are often relied upon to guide feeding management with a lack of available research to guide practice. Opinions regarding what defines best practice for feeding management is dependent on the signs of the infant and often differs between surgeons, neonatologists and nurses[15-17].
- Based on a current study and evidenced from the literature the following protocol (Part-A and Part-B) has been implemented to support the feeding of infants following repair of a gastroschisis[18].



Gastroschisis feeding plan developed by Donna Hobson. Grace Centre for Newborn Care– The Sydney Children's Hospital Network


Feeding Plan for Infants with Gastroschisis Part B
Infrequent Vomiting (not posits)
Appears well
1-2 large vomits in a shift, regardless of colour
Don't Aspirate
Give continuous feeds over 3hrs and vent IGT for 1hr
Or
Skip one bolus feed
Remains well with no further vomiting?
Remains well with occasional or small posits
*tolerating?
Yes
No
Revert to equivalent stage in abdominal closure feeding plan. Continue to vent tube.
Frequent vomiting
OR
Unwell
Aspirate and discard. Place gastric tube on free drainage. Stop feeds until symptoms resolved in consultation with neonatologist. Replace large amounts of gastric output as per medical order.
Resolved?
Go back one stage in the abdominal closure feeding plan
*tolerating: Not fitting above vomiting criteria, appears well, no acute changes, vital signs stable, can continue to posit.
Not tolerating: projectile vomiting, lethargic, change in appearance of abdomen, change in vital signs
Posit: Small frequent vomits
Gastroschisis feeding plan developed by Donna Hobson. Grace Centre for Newborn Care– The Sydney Children's Hospital Network

Recommendation for early oral feeding

Studies have demonstrated the benefits to the infant with gastroschisis if human milk is used to initiate feeding as opposed to artificial feeds. With research concluding that feeding with human milk in the NICU is associated with a significantly decreased hospital stay[18]. Additionally infants receiving solely human milk have a considerably decreased time from initiation of feeds to the achievement of full feeds[18].

- It is recommended that minimal enteral feeds (1ml 4th hourly of breast milk should be commenced as soon as available.
- Please refer to the Gastoschisis feeding protocol for grading up feeds[18].
- The exact timing of feeding is still being researched, but evidence shows that for every day that enteral feeding is delayed the attainment of full feeds is delayed[14].

Continuous versus bolus feeds

- No current evidence conclusively exists for either continuous or bolus feeds for infants with gastroschisis.
- Currently this is guided by clinician preference, however continuous feeds do limit the amount of oral feeds an infant can have, does limit bonding between parent and infant due to lack of oral feeds.
- Continuous feeds do lead to larger gastric residuals due to the constant infusion of milk, leading to more confusion surrounding feeding management.
- Please refer to the Gastoschisis feeding protocol[18] to maintain consistency in feeding.

Feeding intolerance

- The definition of feed intolerance varies with gastric residuals commonly relied upon as an indicator of feeding tolerance[18].
- Gastric residuals have been thought to be an early warning sign of the development of necrotising entero-colitis (NEC). This is based on the theory that the volume of gastric residual is a correct reflection of the actual gastric volume, and offers evidence of gastric emptying. With raised gastric residuals demonstrating delayed gastric emptying and feed intolerance[18].
- Routine aspiration of gastric tubes is not based on evidence and can delay the attainment of full enteral feeds by up to 6 days[18].
- The use of gastric residuals to monitor feed tolerance has been deemed a time consuming practice that causes significant confusion in regards to feeding management, and could cause harm to the delicate gastric mucosa and also potentially lead to the loss of essential gastric enzymes[18].
- Assessment of feeding tolerance should be based on experienced clinical judgement, warning signs such as increasing abdominal distension, discomfort, changes in vital signs, increased vomiting (not posits) unwillingness to suck – not wanting to feed, lethargy and the Clinical Practice Guideline.

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