



GUIDELINE

Surgical Conditions

Scope (Staff):	Nursing and Medical Staff
Scope (Area):	NETS WA

Child Safe Organisation Statement of Commitment

CAHS commits to being a child safe organisation by applying the National Principles for Child Safe Organisations. This is a commitment to a strong culture supported by robust policies and procedures to reduce the likelihood of harm to children and young people.

This document should be read in conjunction with this [disclaimer](#)

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Aim

Summarise the transport considerations for the safe retrieval of neonates with surgical conditions.

Risk

Transferring neonates without proper stabilisation and management is associated with increased morbidity and mortality.

Key points

- Neonates with suspected surgical conditions retrieved by NETS WA are admitted to ward 3B, PCH.
- Some transports may be **time-critical** and others may be elective retrievals. The exact timing and urgency will depend on the location of the neonate, clinical circumstances, and suspected diagnosis.
- Radiology – ensure the referral hospital has loaded any x-rays/imaging onto PACS so they can be reviewed by the receiving neonatal and surgical team. If they cannot be uploaded, then a hard copy or CD must be transferred with the baby
- Maternal blood – Ensure the referral team has taken a maternal blood sample for cross match and completed a pathology request form (2 purple EDTA tubes).
 - Maternal details on the sample **MUST** be hand labelled and include the Mothers UMRN, first name, surname, DOB and the collectors' initials, date, and time of collection.
 - Pathology request form - the person collecting the sample **MUST** sign the collector's declaration on request form and complete all relevant sections on the form.

Bilious Vomiting

Bilious vomiting is **NEVER** normal and must be promptly investigated to exclude [Malrotation/Volvulus](#) and the potential devastating sequelae. Bile is green so it is important to confirm the colour of the vomit/aspirates.

Milk	Lemon	Mustard	Wasabi	Lime	Avocado	Spinach

The gold standard treatment for investigating a suspected malrotation is an upper GI contrast study and review by a surgical team. Normal AXR, abdominal examination, lactate levels, blood pressure, urine output and blood gases do not rule out early intestinal gangrene secondary to malrotation/volvulus. Therefore, these transfers are generally considered a **time-critical retrieval**.

Management

- IV fluids at 60-80mls/kg/day
- Blood samples for septic screen (Blood culture, FBC, CRP), blood gas including lactate, glucose
- IV antibiotics – [benzylpenicillin, gentamicin](#)
- NBM and NGT on free drainage
- AXR – AP and lateral
- Assess if fluid resuscitation is required – 10mls/kg normal saline
- May need respiratory support if distended abdomen

Some babies may be stable enough for a [Nurse Led Retrieval](#) but **MUST always** be discuss with the NETS Consultant.

Bowel Obstruction/Necrotising Enterocolitis (NEC), with perforation or peritonitis

Babies with [NEC](#) +/- perforation may be transferred to PCH for further management.

If the neonate is critically unwell, further discussions between the surgical team and neonatologists at KEMH/PCH/NETS WA **MUST** occur to decide on the best management and timing of retrieval. See [Transfer of Preterm Infants with Intestinal Perforation/Necrotising Enterocolitis to Ward 3B PCH](#)

Management

- Nil by mouth
- Bloods for septic screen (blood culture, FBC, CRP) blood gas, glucose and group and hold
- Assess if fluid resuscitation is required – 10mLs/kg normal saline
- IV Fluids (glucose or glucose/saline). TPN cannot be infused during retrieval (but can be left connected to IV cannula/ PICC line and continue infusing at PCH). Ensure the PICC line always has fluids running through it.
- Insert NGT and put on free drainage
- Abdominal X-Ray – AP and lateral
- IV antibiotics – vancomycin, gentamicin, and metronidazole or tazocin (monotherapy). Refer to [Neonatal Medication Protocols](#)
- Assess analgesia requirements – consider IV paracetamol or morphine infusion
- May need respiratory support if distended abdomen or if blood gas analysis shows respiratory acidosis

If transporting by air, a sea level cabin is recommended to prevent abdominal air expansion at altitude and the risk of respiratory embarrassment. Discuss cabin requirements with the flight crew prior to departure.

Congenital Diaphragmatic Hernia

Most cases of [Congenital Diaphragmatic Hernia](#) (CDH) are antenatally diagnosed with the birth planned at KEMH. As surgery is NOT considered urgent, it may take several days for the neonate to be physiologically stable enough for transfer from KEMH to PCH.

Neonates with undiagnosed CDH who are not born at KEMH should be transferred to PCH as soon as possible.

These babies are often the sickest and most challenging neonates that NETS retrieve. NETS can transfer neonates on nitric oxide therapy from all locations in WA, and on HFOV (Fabian) from metro locations only.

Airway and ventilation management

- Always intubate and ventilate for retrieval
- Bag and mask ventilation should be avoided to prevent bowel distension.
- Insert large-bore nasogastric tube to decompress the stomach and small bowel. 8FG <34 weeks and 10FG ≥34 weeks
- Gentle ventilation. Use volume targeted ventilation with a TV of 4-5mLs/kg to minimise barotrauma
- If requiring PIP >25 cmH20 then may require HFOV
- Keep spontaneously breathing. Avoid muscle relaxants
- Aim to normalise pH and lactate

Persistent Pulmonary Hypertension of the Newborn (PPHN)

PPHN may require the use of pulmonary vasodilators, beginning with nitric oxide. Refer to [Persistent Pulmonary Hypertension in the Newborn NETS Guideline](#) for the use of inhaled nitric oxide during retrieval.

Sedate well with [Morphine](#) or [Fentanyl](#) infusion.

Inotropic support and/or volume may be required to maintain adequate blood pressure

IV access

UAC and UVC lines are desirable to allow close monitoring of blood pressure and ability to give multiple infusions. However, insertion of umbilical lines should not delay transfer. Discuss management with the NETS Consultant.

Exomphalos

[Exomphalos](#) may not require an urgent transport as the protective membrane prevents heat and fluid loss but this will depend on the location of birth.

Other congenital abnormalities are more likely with exomphalos than with gastroschisis. If the protective membrane ruptures, then babies should be transported urgently to PCH. Follow Gastroschisis management.

Gastroschisis

Most [Gastroschisis](#) are antenatally diagnosed with the birth planned at KEMH. Ensure the surgical team at PCH are aware of the impending admission.

Management

- Place the neonate in two impermeable bags, one covering the legs and the other under the armpits. This should keep the exposed bowel separate from urine and faeces. Do not cover the bowel with saline soaked gauze.
- Position patient on their right-hand side. Assess colour and perfusion of the exposed bowel regularly.
- Insert size 8F or 10F NGT and leave on free drainage. Beware of bile aspiration. Replace NG losses with normal saline if >10ml/kg/12 hrs.
- If requiring respiratory support, consider humidified high flow oxygen, otherwise consider intubation. Try to avoid CPAP.
- Start maintenance fluids at 80-100mLs/kg/day. In addition, start **10mLs/kg/hr** normal saline to cover fluid losses. This should continue until the silo has been applied or a formal reduction of the gastroschisis is achieved, whichever occurs first.
- May require fluid bolus (10mLs/kg normal saline).
- Commence IV antibiotics - [Piperacillin Tazobactam](#) as monotherapy

Transport considerations

- Ensure neonate is on their right side with bowel well positioned and visible to allow frequent visual assessment.
- Pay meticulous attention to thermoregulation as the neonate is at risk of hypothermia due to the exposed bowel.
- A silo may have been placed by the surgical team at KEMH prior to transporting to PCH. Do not secure the silo to the top of the transport cot in case of sudden acceleration or deceleration forces during the transport which may cause silo dislodgement. Support the silo in place by a material roll ensuring the bowel is always visible.

Myelomeningocele

Contact neurosurgeon on-call and discuss timing of transport for an infant with a [Myelomeningocele](#) (usually this is not a middle of the night emergency but will depend on the location of birth).

Surgical closure is recommended within the first 24 hours in order to prevent infection and trauma to the exposed tissues.

- Nurse prone.
- Avoid using latex to prevent sensitisation in later life.
- Use a silicone-based protective dressing and a non-adherent pad to cover and protect the lesion (Mepilex non-adhesive dressing with adhesive border is ideal)
- Start broad spectrum antibiotics depending on the advice of the neurosurgeon

Oesophageal Atresia +/- Tracheoesophageal Fistula

Neonates with [Oesophageal Atresia/Tracheoesophageal Fistula](#) can present with copious oral secretions post birth, coughing and choking with feeds, aspiration of feeds/ secretions, dusky episodes and/or inability to pass an orogastric tube/ nasogastric tube.

There may be history of polyhydramnios during pregnancy. A chest x-ray may confirm an oesophageal atresia with the gastric tube curled up in the oesophageal pouch.

Management

- Avoid respiratory support if possible. Inspiratory gases take the path of least resistance i.e., through the fistula and may cause significant abdominal distension and/or perforation. If ventilation is required, the transport becomes a **time critical retrieval** and possibly a surgical emergency.
 - **Always** discuss with the NETS WA Consultant prior to initiation of respiratory support.
- Nurse prone to prevent aspiration and assist drainage of secretions from the oesophageal pouch.
- Refer to [Appendix 1: Replogle Tube During Transport](#)
- Losses from the replogle tube should be recorded and replaced if excessive.

DO NOT ATTACH ANY HIGH PRESSURE SUCTION TO THE REPOGLE TUBE

Transport of neonates following surgical procedure

Neonates discharged from PCH 3B to another hospital following a surgical procedure may be more at risk of apnoea/ bradycardia during the transfer if transferred <24 hours post anaesthetic, therefore must receive full monitoring and be transported in the NETS cot.

Some babies may be suitable for nurse led retrieval. Discuss with NETS Consultant prior to arranging transfer.

Related CAHS internal policies, procedures and guidelines

Neonatal Guidelines

[Congenital Diaphragmatic Hernia](#)

[Exomphalos/Omphalocele](#)

[Gastroschisis](#)

[Malrotation/Volvulus of the Intestines](#)

[Myelomeningocele](#)

[Oesophageal Atresia/Tracheoesophageal Fistula](#)

NETS WA Guidelines

[Nurse Led Retrieval](#)


[Persistent Pulmonary Hypertension in the Newborn](#)

[Transfer of Preterm Infants with Intestinal Perforation/Necrotising Enterocolitis to Ward 3B PCH](#)

References and related external legislation, policies, and guidelines

WNHS [Neonatal Medication Protocols](#)

This document can be made available in alternative formats on request.

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Healthy kids, healthy communities

Compassion

Excellence

Collaboration

Accountability

Equity

Respect

Neonatology | Community Health | Mental Health | Perth Children's Hospital

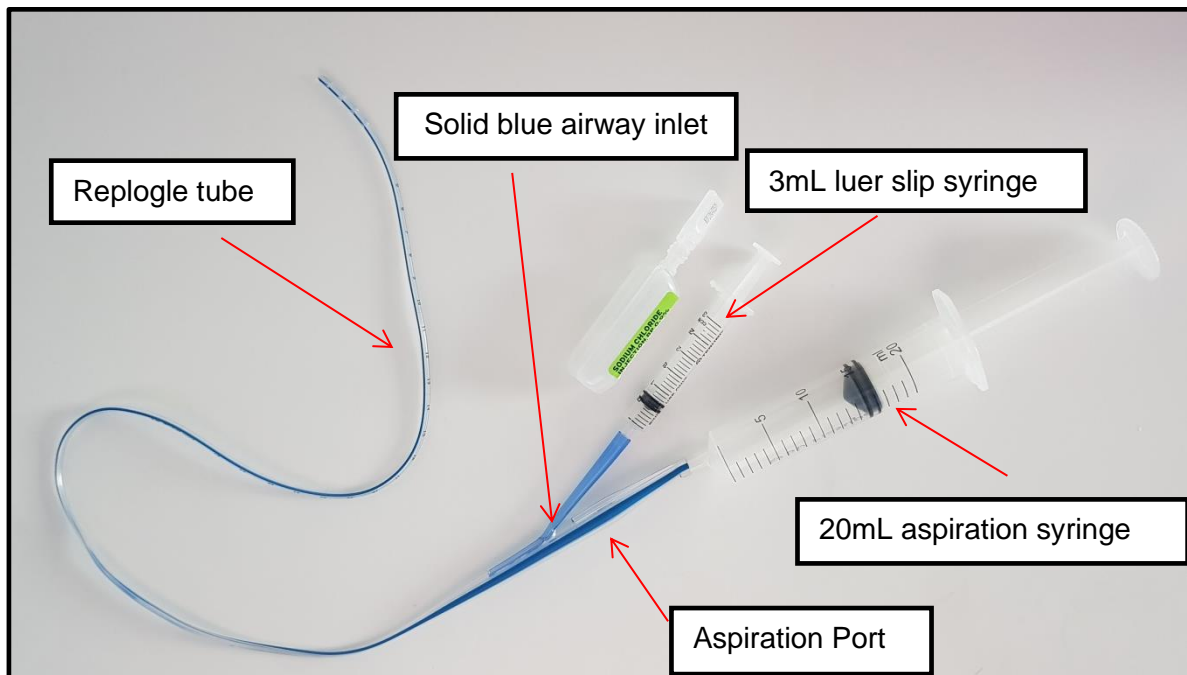
Appendix 1: Replogle Tube during Transport

Indications

A replogle tube is required for infants with suspected oesophageal atresia or distal tracheoesophageal fistula. A replogle tube is used to drain saliva from the upper oesophageal pouch and is positioned 0.5cm above the end of the pouch. Adequate drainage of the pouch is required to prevent saliva spilling over into the trachea resulting in aspiration.

Equipment:

- Argyle 8Fg replogle tube (<2.5kg neonate)
- Argyle 10Fg replogle tube (>2.5kg neonate)
- 20mL luer slip syringe
- 3ml luer slip syringe
- 0.9% NaCl ampules
- 12.5mm brown tape

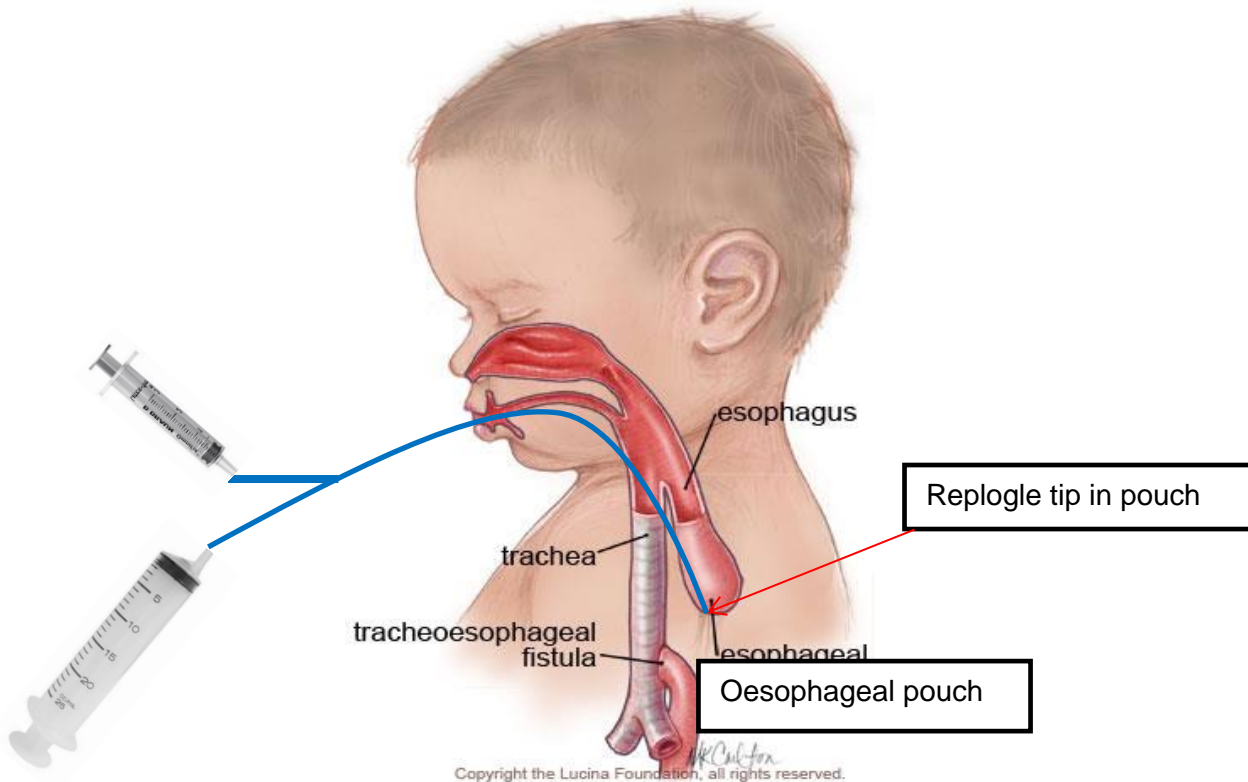


Procedure:

- Choose appropriate size replogle tube based on patient weight.
- Insert replogle tube orally until resistance is felt, then withdraw 0.5cm and secure with brown tape (OGT taping). Ensure length of insertion is recorded. If not tolerated orally, replogle tube can be inserted nasally.
- Attach 20mL luer slip syringe into aspiration port.

- Instil 0.5mL of N/Saline through solid blue airway inlet and follow with enough air to clear Replogle tube (0.5ml to 2ml of air). Then remove 3mL syringe from airway inlet. Aspirate using the 20ml aspiration syringe from aspiration port, ensuring secretions and saline are effectively removed and the replogle tube remains patent.

DO NOT ATTACH REPLOGLE TO THE TRANSPORT SUCTION UNIT



Care of Replogle Tube:

- Confirm replogle tube is taped securely at documented length every 15 minutes and record flushes on NETS WA Observation & Management Chart - MR400.01.
- To prevent replogle tube blockage **Repeat procedure step 4 every 15 minutes.** Leave 20mL syringe in place throughout transport. Extra flushes may be required if secretions are thick.
- To prevent aspiration and assist drainage, nurse the infant on an incline e.g. towel under mattress.

Troubleshooting:

If there are concerns of replogle tube blockage, ensure airway remains patent by performing naso-pharyngeal suction.

Flush replogle tube as per step 4. If still no movement of fluid through the tube or no return of saline, flick out replogle tube from infant, flush well with N/Saline, confirm it is patent and then reinsert.