

# OESOPHAGEAL ATRESIA AND TRACHEO-OESOPHAGEAL FISTULA

## PRE AND POST-OP CARE IN THE NEONATE

### PRACTICE GUIDELINE<sup>®</sup>

#### DOCUMENT SUMMARY/KEY POINTS

- Infants should be nursed with the head of the bed elevated to 30-40 degrees.
- All pre-operative infants with oesophageal atresia should have a repleg tube inserted and connected to continuous suction of -5 kPa at all times.
- The repleg tube can be transferred from continuous suction at the bedspace and commenced on transport portable suction set to 80mmHg during transfer of infants to the operating theatre and other hospital departments.
- Flush small lumen (blue end) of repleg tube every 15 minutes with 0.5ml normal saline +/- air.
- Use maximum 0.5 ml sterile normal saline with each flush.
- Between saline flushes, if the infant develops desaturation or has copious oral secretions, flush small lumen with 1-2 ml air and observe if secretions are moving through the repleg tube prior to using saline.
- Thick secretions or frequent oxygen desaturations may require more frequent flushing, discuss this with the Neonatal team.
- Pre-operatively, the use of High Flow Nasal Prongs, mask or nasal prong CPAP, bag and mask ventilation and mechanical ventilation should be avoided where possible.
- Once extubated post-operatively, infants should not be placed on high-flow nasal prong oxygen or mask or nasal prong CPAP unless discussed with the Neonatologist and

This document reflects what is currently regarded as safe practice. However, as in any clinical situation, there may be factors which cannot be covered by a single set of guidelines. This document does not replace the need for the application of clinical judgement to each individual presentation.

<b>Approved by:</b>	SCHN Policy, Procedure and Guideline Committee	
<b>Date Effective:</b>	1 <sup>st</sup> March 2019	<b>Review Period:</b> 3 years
<b>Team Leader:</b>	Nurse Educator	<b>Area/Dept:</b> GCNC

**Surgical Consultant.**

- Endo-tracheal suctioning is limited to above the site of the fistula following surgery.
- The position and taping of the trans-anastomotic tube should be checked regularly, to ensure that the tube does not become dislodged.
- The trans-anastomotic tube is not to be removed until permission is given by the surgeon.
- Only Surgeons are to insert new trans-anastomotic tubes.
- If the infant has had a Foker procedure, the dressing will usually be attended daily by the Surgeon to adjust the tension. Nursing staff are not to change, adjust or remove the dressing unless the Surgeon is present, as this will affect the amount of traction being provided.
- All infants with OA and or TOF should be referred to the CHW infant lung clinic for long term follow-up. A member of the infant lung clinic should be contacted to see the patient prior to discharge.
- Key Performance Indicators
  - Replegle tube is positioned correctly in oesophageal pouch observable on chest x-ray.
  - Trans-anastomotic tube is taped securely and labelled.
  - Contrast study is attended on the 5<sup>th</sup> post-operative day or first working day thereafter.

## CHANGE SUMMARY

- Nursing care of the replegle tube has been amended:
  - Frequency of saline flushes increased to 15 minutely
- Securing of the replegle tube nasally has been included including pressure area management
- Transfer of a patient off the ward has been amended to include the use of portable suction for continuous replegle suction
- Post-operative management has been amended:
  - Post-operative antibiotic therapy has been added

This document reflects what are currently regarded as safe practice. However, as in any clinical situation there may be factors that cannot be covered by a single set of guidelines. This document does not replace the need for the application of clinical judgement to each individual presentation.

# TABLE OF CONTENTS

<b>Background</b> .....	<b>4</b>
Definition .....	4
Etiology .....	4
Diagnosis .....	5
Surgical procedures .....	5
<i>Primary repair</i> .....	5
<i>Staged repair</i> .....	5
<b>Pre-Operative Care</b> .....	<b>6</b>
Positioning .....	6
Reprople tube .....	6
<i>Specific Instructions:</i> .....	6
Transport .....	7
<i>Nursing Care</i> .....	7
<i>Emergency Situations</i> .....	8
Monitoring .....	8
Maintenance of fluid balance .....	8
Ventilation .....	8
Investigations .....	9
<b>Post-Operative Care</b> .....	<b>9</b>
Ventilation .....	9
Suctioning .....	9
Investigations .....	9
Antibiotics .....	10
Chest Drain .....	10
Pain Management .....	11
Trans-anastomotic tube .....	11
Wound Care .....	11
Feeds .....	11
Discharge Planning .....	12
<b>Complications</b> .....	<b>12</b>
Anastomotic Leak .....	12
Gastro-oesophageal Reflux .....	12
Chylothorax .....	12
<b>Parent Education</b> .....	<b>13</b>
<b>References</b> .....	<b>13</b>

## Background

### Definition

Oesophageal atresia (OA) is a congenital anomaly in which the oesophagus ends in a blind pouch<sup>1</sup>. Tracheo-oesophageal fistula (TOF) refers to a fistula (connection) between the trachea and the oesophagus<sup>2</sup>.

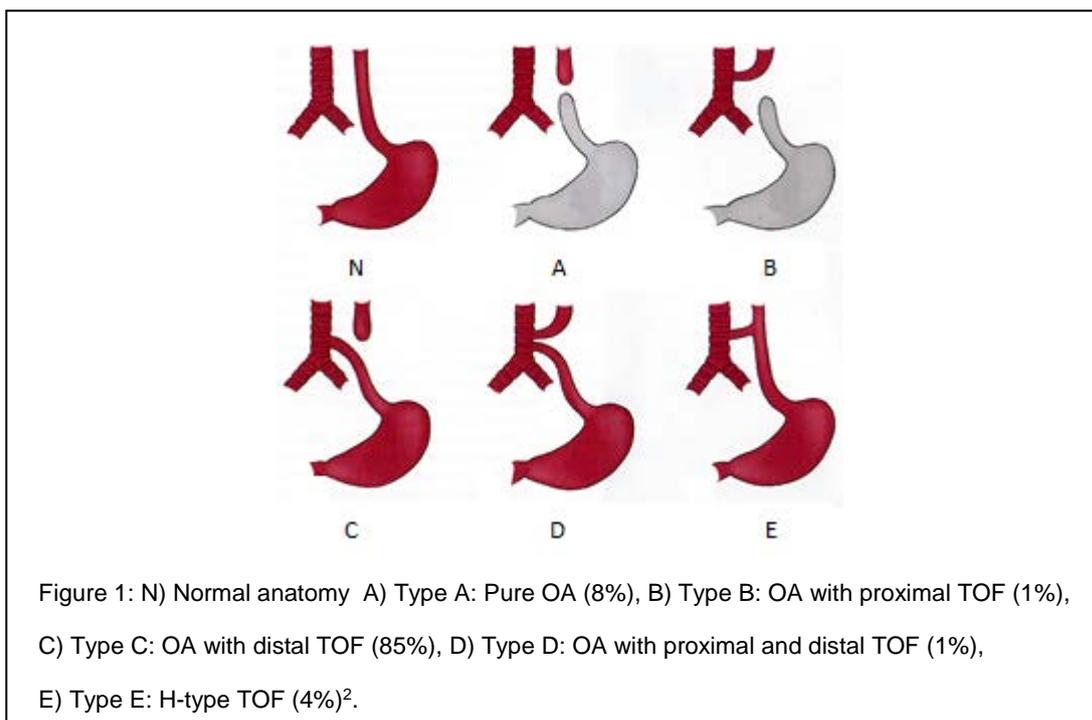
### Etiology

The development of OA and TOF occurs during early foetal development at approximately 22-36 days post conception<sup>3</sup>. It is a result of abnormalities which occur during the process of separation of the primitive foregut tube into the respiratory and gastrointestinal components<sup>4</sup>.

The pathological anatomy of the condition is variable. The most common presentation is Type C OA with a TOF from the trachea to the distal part of the oesophagus accounting for 85% of all OA. The next commonest is OA with no TOF as these often have a long gap between the two oesophageal ends. A H-type defect is where a TOF occurs in the presence of an otherwise normal trachea and oesophagus. Rarer presentations are OA with a proximal TOF from the upper oesophageal pouch to the trachea, and OA with both a proximal and distal TOF<sup>4</sup>. See figure 1.

Other structural anomalies occur in 50-70% of infants with OA and TOF these are often referred to as VATER or VACTERL association<sup>2</sup>. The abnormalities included in VACTERL association are **V**ertebral anomalies, **A**norectal, **C**ardiac defects (usually patent ductus arteriosus, atrial septal defect and ventricular septal defect), **T**racheo-**o**esophageal, **R**enal and **L**imb anomalies<sup>5</sup>.

TOF/OA occurs in around 1 in every 2500-4500 live births. There is no known cause with the majority of cases occurring sporadically, however it is noted to be 2-3 times more likely to present in twins<sup>3</sup>.



## Diagnosis

The presence of the following symptoms could indicate OA and or TOF:

- A history of polyhydramnios is often present in an OA without a fistula (Type A) as there is no pathway for the absorption of amniotic fluid. Polyhydramnios is uncommon in the commonest form of OA with a distal TOF<sup>1,2</sup>.
- Large volumes of frothy oral secretions are produced and may lead to coughing, choking and aspiration into the lungs<sup>1</sup>.
- Feeding intolerance with gagging and vomiting of undigested milk through the mouth and nose<sup>6</sup>.
- Inability to pass a size 6fg or 8fg nasogastric tube further than 7-10cm<sup>1</sup>.
- Abdominal distension if a distal TOF is present<sup>1,2</sup>.
- A chest x-ray may show the nasogastric tube resting against the wall of the air filled oesophageal pouch or may show it coiled within the pouch. Large amounts of air in the stomach and intestines could indicate a distal TOF<sup>1,2,3</sup>.

## Surgical procedures

### *Primary repair*

Primary repair of oesophageal atresia and tracheo-oesophageal fistula involves a surgical incision (usually a thoracotomy), ligation and division of the tracheo-oesophageal fistula and an end-to-end anastomosis of the upper and lower ends of oesophagus<sup>6</sup>.

At the commencement of the surgical procedure, a laryngo-bronchoscopy (LBO) will often be performed to assess the presence, size and location of the fistula, which is usually around 5–7mm above the carina. The procedure may also check for the presence of bronchial abnormality or tracheomalacia, which may influence when to extubate the infant after surgery.

### *Staged repair*

A staged repair may be attended when the pulmonary status of the infant is too unstable such as when the infant is born prematurely or when there is a long gap between the proximal and distal oesophagus, usually types A;B and occasionally C. Long gap oesophageal atresia is defined as a distance >2cm between the proximal and distal oesophagus, or approximately 2 vertebrae on chest x-ray<sup>5</sup>. These cases typically involve the ligation and division of the fistula (when present) and a gastrostomy to allow for gastric decompression and feeding. Continuous drainage of the oesophageal pouch continues with the use of a repleg tube<sup>2,3</sup>. A delayed primary repair will often be attended approximately 8-12 weeks later<sup>5</sup>.

An alternative to a delayed stage repair may be the Foker procedure. This may be offered in cases where there is a very large gap between the upper and lower oesophageal segments. The Foker procedure involves the induction and stimulation of growth of the short oesophageal segments through the use of externalised sutures kept under tension<sup>6,7</sup>. This is achieved through the use of surgically placed sutures into the ends of each oesophageal segment which are then brought out through the skin and secured under tension. Stimulation of growth is encouraged through increasing the tension daily. Once there has been sufficient growth of the

oesophageal segments, the infant will then be offered a delayed primary oesophageal repair; this will usually take between 5-14 days.

Should primary repair not be feasible, there are a number of different techniques available to restore continuity including using a 'gastric pull-up' or a colonic interposition<sup>7</sup>.

## Pre-Operative Care

### Positioning

- Infants should be nursed with the head of the bed elevated by 30-40 degrees<sup>2</sup> to facilitate collection of secretions by the repleg tube and to reduce the risk of gastrointestinal contents entering the lungs via a distal TOF. This can reduce the risk of aspiration pneumonia. To promote consistency of nursing care, appropriate signage should be applied to the patient's bed detailing positioning requirements and documented in the patient's electronic medical record.

### Repleg tube

For an infant with an oesophageal atresia the repleg tube allows for continuous aspiration of the blind oesophageal pouch, thereby reducing the risk of aspiration pneumonia. The second lumen allows the lumen to be flushed thus reducing the risk of blockage and the accumulation of thick, viscous secretions.

#### **Specific Instructions:**

- All pre-operative infants with OA should have a repleg tube inserted and connected to continuous suction of -5 kPa at all times.
- The first insertion of a repleg tube should be attended by a NUM, CNS or member of the surgical team.
- Nasal insertion is preferential provided the patient does not also have choanal atresia or is a small baby <2000grams. Nasal insertion promotes opportunities for non-nutritive sucking and decreases the risk of accidental tube dislodgement particularly when facilitating wrapping with hands to face depending upon the infants individualised developmental care plan.
- When inserting or replacing the repleg tube, gently insert the tube and advance into the pouch until resistance is met, usually around 8-10cm from the lips. Care must be taken that the tube does not perforate the posterior pharyngeal wall and that the tube is not taped so as to cause undue pressure on the pouch.
- For a nasally inserted repleg tube:
  - Apply a strip of *Comfeel* to the cheek on the same side that the repleg is inserted, ensuring that it is close to the nare
  - Cut a piece of *Leucoplast* tape long enough to cover from nare to tragus of the ear and cut two small slits at either end, horizontally.
  - Allow the repleg tube to gently go down from the nare, and across the *Comfeel*, ensuring that the repleg tube does not press against or blanch the

nare. Check the measurement of the replegle tube before applying the Leucoplast.

- To secure an oral replegle tube:
  - Apply a strip of *Comfeel* to the side of the mouth
  - Cut two trouser leg pieces of *Leucoplast* tape.
  - Place one side of the trouser leg across the philtrum and wrap the other side around the replegle tube at the desired measurement at the corner of the mouth.
  - The second trouser leg is applied to the opposite side of the lips, one side placed on the philtrum and the other wrapped around the looped replegle tube.
- Document insertion and measurement in the patient's electronic medical record
- Excessive oral secretions may indicate that the tube has become blocked, the connections are not secure or the tube is not correctly placed in the oesophageal pouch. If the secretions are not being aspirated check the tube position and if necessary, replace tube.
- A spare replegle tube must be kept at the bedside at all times.

## Transport

- When transferring a patient with a replegle tube insitu, the patient is to remain on continuous suction.
- The use of portable suction has been approved in consultation with the surgical team as part of safe airway management for the patient.
- Ensure that a portable suction machine is charged and suctioning appropriately.
- Disconnect the patient from their bedside suction, and connect to the portable suction set to 80mmHg.
- Ensure that oro-pharyngeal suction catheters are also available in the event of an emergency.

## Nursing Care

- Frequently check that the replegle tube is correctly positioned and functioning properly by observing that secretions are being aspirated.
- Change the replegle tube every three days as per the manufacturer recommendation as tube functionality decreases with frequent sump of excessive or thick secretions<sup>8</sup>.
- If securing nasally, alternate insertion sides with each change to prevent pressure injury to the patient.
- Ensure that the tape is dry to prevent the tube slipping from the correct position.
- Change suction tubing and bottle every second day or as required.
- Flush small lumen (blue end) with 0.5 ml sterile normal saline every 15 minutes to ensure the tube and suction is functioning. 10 ml ampoules of normal saline may be used. The saline flush may be followed by a flush with 1-2 ml air. The saline should be visible

immediately moving through the tube. Secretions should be moved through the length of the tube into the suction trap to ensure patency. Ensure flushing syringe is not left attached after flushing as this can block the sump drainage system.

- Between saline flushes, if the infant desaturates or has copious oral secretions, flush small lumen with 1-2 ml air and observe if secretions are moving through the replegle tube prior to using saline.
- Thick secretions or frequent desaturations may require more frequent flushing, discuss this with the Neonatal team.
- A reoccurring timer should be set on the patient's bedside monitor at the interval of replegle flushing
- Document all flushes in the patient's electronic medical record.
- Patient's with a replegle tube are able to and should have PO sucrose administered prior to and during painful procedures
- EHM for Immune Supportive Oral Care (ISOC) is encouraged for patients with a replegle tube.

### **Emergency Situations**

- If unable to flush the replegle tube, remove the replegle tube and suction the oro-pharynx gently with an oral suction catheter no further than the measured depth of the oesophageal pouch.
- Immediately insert a new replegle tube.
- Ensure that a properly functioning flow-inflating bag and emergency suction equipment is available at all times.

### **Monitoring**

- The infant should have continuous heart rate, respiratory and saturation monitoring with hourly observations, documented in the patient's electronic medical record.
- Ventilated infants should also have end tidal carbon dioxide monitoring.

### **Maintenance of fluid balance**

- The infant will be nil by mouth and receiving intravenous therapy unless a gastrostomy has been sited due to long gap OA.
- All nappies should be weighed and an accurate input and output fluid balance maintained.

### **Ventilation**

- The use of High Flow Nasal Prongs, mask or nasal prong CPAP, bag and mask ventilation and mechanical ventilation should be avoided where possible. If required, minimal pressures should be used to avoid over-distension of the abdomen from air passing from the trachea into the stomach via the fistula. If there is a need for increased preoperative respiratory support the surgical team should be informed immediately

- Where mechanical ventilation is required regularly assess the abdomen for the degree of abdominal distension.

## Investigations

- All infants with a TOF or OA should have a VACTERL screening as TOF and/or OA are commonly associated with other conditions, however not all patient's will have additional comorbidities identified through this process<sup>9</sup>.
- A chest x-ray and abdominal x-ray following admission to assess the presence of a distal fistula and examine the vertebrae. If a distal fistula is present, the stomach will contain air while if no distal fistula is present, the stomach will have no air<sup>3</sup>.
- A cardiac assessment including echocardiography should be sought to identify if any cardiac abnormalities are present and to visualise the position of the aorta as this may affect the side from which the operation is performed.
- A renal ultrasound should also be performed to identify the presence of a renal anomaly.

## Post-Operative Care

### Ventilation

- Infants will usually return to the ward from the operating theatre intubated and ventilated.
- In the event where the oesophageal gap is large and a large amount of tension is placed on the anastomotic site, the infant maybe muscle relaxed and should be nursed with the head in a flexed position as ordered and documented by the Surgeon.
- Care of the ventilated and muscle relaxed infant is undertaken according to the [Respiratory Support in the NICU Practice Guideline](#)<sup>10</sup>.
- Once extubated, infants should not be placed on high-flow nasal prong oxygen or mask or nasal prong CPAP unless discussed with the Neonatologist and Surgical Consultant.

### Suctioning

- When suctioning the oropharynx care needs to be taken to ensure the passage of the catheter does not damage the anastomosis. The catheter is passed no more than a few centimetres into the mouth.
- Endo-tracheal suctioning is limited to shallow suctioning (do not extend beyond the length of the ETT) above the site of the repair of the fistula as suctioning at or past the site may cause trauma to the site and can lead to breakdown or a leak from the site.
- The length of the passage of the suction catheter is documented in the patient's electronic medical record.

### Investigations

- On return to the ward from the operating theatre, a chest x-ray is necessary to check for the presence of air in the pleural or extra-pleural space as well as the placement of the endo-tracheal tube, chest drain and any other lines that are present.

- Blood is collected for a blood gas and electrolytes, urea and creatinine and a full blood count are taken and sent to pathology.
- A contrast study is to be attended on the 5<sup>th</sup> working day post-surgery to check for evidence of stricture or leakage at the anastomotic site.
- Any investigations for VATER and VACTERL association that were not attended pre-operatively can be completed in the post-operative period.

## Antibiotics

- The insertion of a chest drain post operatively indicates the need for prophylactic intravenous antibiotics in the form of Cefazolin until drain removal. Additional intravenous antibiotics are at the discretion of the individual surgeon.

## Chest Drain

- A chest drain connected to an underwater sealed drainage system is sited during the operation. The position of the chest drain may be intra-pleural or extra-pleural and its position should be documented in the patient's electronic medical record.
- On return to the ward from theatres, the chest drain should only be attached to suction at -20cm H<sub>2</sub>O on the Atrium Oasis Drainage System if ordered by the Surgeon.
- Hourly observations of the chest drain include:
  - Monitoring the tube and drain for the presence of swinging and bubbling. The presence of bubbling represents a leak of air into the thoracic cavity. This may be due to a leak from the anastomosis or from the trachea. If bubbling present, the Surgeon should be contacted to review the infant.
  - Any losses should be measured and assessed for appearance.
  - If intragastric feeds have been commenced prior to chest drain removal, the fluid should be checked for the presence of milk.
  - The insertion site should also be checked to ensure the drain remains secure and nil signs of infection are present.
  - Where ordered, the suction should be checked to ensure it is still attached and working. This should be a separate suction canister to the patient's bedside emergency equipment.
  - Two clamps must be available at the bedside at all time in the event of accidental disconnection of the inserted chest drain from the chest drain chamber.
- Abnormalities, especially in the amount or appearance of drainage, must be notified to the Medical Officer and Nurse-in-Charge immediately.
- The chest drain is removed at the specific direction of the surgeon, usually following a satisfactory contrast study.

## Pain Management

- In the immediate post-operative period, pain should be assessed 2-4 hourly and analgesia given as per the [Pain Management in Newborn Infants Practice Guideline](#)<sup>10</sup>.

## Trans-anastomotic tube

- A trans-anastomotic tube will usually be inserted by the Surgeon during the operation.
- The trans-anastomotic tube must be clearly labelled as such and with the date of insertion.
- The position of the trans-anastomotic tube at the nares should be recorded in the patient's electronic medical record upon return from the operating theatre.
- The position and taping of the trans-anastomotic tube should be checked regularly, to ensure that the tube does not become dislodged.
- The trans-anastomotic tube is placed on free drainage with the management of this dictated by the surgical team.
- Feeds are only to be commenced via the trans-anastomotic tube when indicated by the Surgeon.
- The tube is not to be removed until permission is given by the surgeon. This will usually be given once the infant is tolerating full oral feeds.
- In the event that the tube is accidentally removed, the Surgeon and Nurse-in-Charge are to be notified immediately. An IIMS report should also be completed.
- Only Surgeons are to insert new trans-anastomotic tubes.

## Wound Care

- On return to the ward from the operating theatre the wound is observed and the appearance of the wound documented in the patient's electronic medical record.
- The wound is then assessed each shift for signs of bleeding or infection and any abnormalities found should be reported to the Neonatal Medical Officer and Surgeon.
- The dressing is to be removed seven days post-surgery as directed by the surgeon.
- If the infant has had a Foker procedure, the dressing will usually be attended daily by the Surgeon to adjust the tension. Nursing staff are not to change, adjust or remove the dressing unless the Surgeon is present, as this will affect the amount of traction being provided.

## Feeds

- The infant will usually be kept nil by mouth until the contrast study has been performed on day five and nil evidence of leakage found.
- Feeds via the trans-anastomotic tube may be commenced prior to this at the discretion of the Surgeon.

- In the event where feeds are introduced prior to the contrast study, they should be commenced at a small amount and graded up slowly to prevent reflux into the oesophagus up to the anastomotic site.
- Once the contrast study has been performed and permission to give feeds has been given by the Surgeon, oral and trans-anastomotic tube feeds may be commenced and graded up as tolerated by the infant.
- The surgical team should be consulted in regards to the patient being prescribed a proton pump inhibitor such as omeprazole or ranitidine.

## Discharge Planning

- Planning for discharge should begin on admission as per the [Discharge Of Infants Home From Grace Centre For Newborn Care Practice Guideline<sup>11</sup>](#).
- All infants with OA and or TOF should be referred to the CHW infant lung clinic for long term follow-up. A member of the infant lung clinic (Dr Karpelowsky or A/Prof Fitzgerald) should be contacted to see the patient prior to discharge.
- Prior to discharge, outpatient appointments should be made with the Surgeon, the CHW infant lung clinic and the Grace Newborn Follow-up Clinic.
- All infants will be followed up in the Grace Developmental Clinic

## Complications

### Anastomotic Leak

The presence of an anastomotic leak may be indicated clinically by persistent or increased drainage from a chest drain or by the presence of bubbles or saliva in the drain or drainage under the wound dressing. It may be indicated radiologically by a pneumothorax on chest xray or leakage of contrast into the chest during a contrast study. The treatment for an anastomotic leak usually involves drainage of the fluid via a chest drain, the infant remains nil by mouth on intravenous fluids and antibiotics may be used<sup>3,8</sup>. If a leak is suspected the surgical team should be informed as surgical revision may be required.

### Gastro-oesophageal Reflux

Gastro-oesophageal reflux is a common complication due to decreased oesophageal peristalsis and the upward pull on the lower oesophageal pouch and stomach<sup>2,10</sup>. The presence of reflux may result in oesophagitis and the formation of strictures as well as nutritional and respiratory problems<sup>7</sup>. The prophylactic use of proton pump inhibitors, in order to reduce gastric acid production, should be used in this situation<sup>7</sup>, and continued on discharge. This is also an important clinical consideration for the patient with a gastrostomy sited in the case of long gap OA as leaking of gastric contents can occur and may irritate the surrounding skin resulting in skin breakdown.

### Chylothorax

A rare complication is a chylothorax where chyle from the thoracic duct leaks into the pleural space which may result as a complication of surgery to the thorax or neck<sup>12</sup>. Chyle may

appear as a cloudy liquid in the drainage from the chest drain. Treatment for a chylothorax includes drainage through a chest drain and the use of Monogen once feeds are commenced.

## Parent Education

- Parents are not responsible for repleg tube management including routine flushes. This is an important aspect of the patient's airway management and is the responsibility of the bedside nurse.
- Parents should be included in the development of a care plan for their infant from admission.
- Where possible, parents should be encouraged to participate in caring for their infant through attending to cares and having cuddles.
- Parent education as a part of discharge planning should also begin from admission<sup>13</sup>.
- A factsheet on [Oesophageal Atresia and/or tracheo-oesophageal fistula](#)<sup>14</sup> is available on the Children's Hospital at Westmead website that contains information on the abnormality as well as long term complications which can be given to parents.

## References

1. Evers, D.B. 2018 Alterations of digestive function in children. In Huether, S.E. and McCance, K.L. (eds) *Understanding Pathophysiology*, 8<sup>th</sup> edn, Mosby. Philadelphia.
2. Montrowl, S. 2013 Gastrointestinal system. In Kener, C. and Lott, J.W. (eds) *Comprehensive Neonatal Care: An Interdisciplinary Approach*. 5<sup>th</sup> edn, Springer Publishing Co, New York.
3. Bucher, B., Pacetti, A., Lovvorn, H. and Carter, B. 2016 Neonatal surgery. In Merenstein, G.B. and Gardner, S.L. (eds) *Handbook of Neonatal Intensive Care*. 8<sup>th</sup> edn, Elsevier, Missouri.
4. Ioannides, A.S. and Copp, A.J. 2009 Embryology of oesophageal atresia. *Seminars in Pediatric Surgery* 18, 2-11
5. Maheshwari, R., Trivedi, A., Walker, K. & Holland, A.J. 2013, 'Retrospective cohort study of long-gap oesophageal atresia', *J Paediatr Child Health*, vol. 49, no. 10, pp. 845-9.
6. Rodger, C. 2014 The Child with Gastrointestinal Dysfunction. In Hockenberry, M.J. and Wilson, D. (eds) *Wong's Nursing Care of Infants and Children*. 10<sup>th</sup> edn, Elsevier, New York.
7. Holland, A.J. & Fitzgerald, D.A. 2010, 'Oesophageal atresia and tracheo-oesophageal fistula: current management strategies and complications', *Paediatr Respir Rev*, vol. 11, no. 2, pp. 100-6; quiz 6-7.
8. 'Argyle™ Repleg Suction Catheters – Product information.' 2013. Covidien. <http://www.kendalltp.com/pageBuilder.aspx?topicID=146881&breadcrumbs=144286:0> <Accessed 2018, December>
9. VACTERL or VATER association available: <https://www.cincinnatichildrens.org/health/v/vacterl> <Accessed 2018, November>
10. Respiratory Support in the NICU (Guideline No. 0/C/07:0005-01:02) available: <http://webapps.schn.health.nsw.gov.au/epolicy/policy/1157> <Accessed 2018, September >
11. Pain Management in Newborn Infants (Guideline No: 2006-0028 v2) available: <http://webapps.schn.health.nsw.gov.au/epolicy/policy/3886> <Accessed 2018, September>
12. Discharge Of Infants Home From Grace Centre For Newborn Care (Guideline No: 2008-0019 v3) available: <http://webapps.schn.health.nsw.gov.au/epolicy/policy/1582> <Accessed 2018, November>
13. O'Toole, M.T. 2016 *Mosby's Medical, Nursing and Allied Health Dictionary*, 10<sup>th</sup> edn, Elsevier, Missouri.
14. The Children's Hospital at Westmead, Sydney Children's Hospital, Randwick and Kaleidoscope 2018 *Factsheet: Oesophageal atresia and/or tracheo-oesophageal fistula*. Available URL:

[http://www.chw.edu.au/parents/factsheets/tracheo\\_oesophageal\\_fistula.htm](http://www.chw.edu.au/parents/factsheets/tracheo_oesophageal_fistula.htm) < Accessed 2018, November >

**Copyright notice and disclaimer:**

The use of this document outside Sydney Children's Hospitals Network (SCHN), or its reproduction in whole or in part, is subject to acknowledgement that it is the property of SCHN. SCHN has done everything practicable to make this document accurate, up-to-date and in accordance with accepted legislation and standards at the date of publication. SCHN is not responsible for consequences arising from the use of this document outside SCHN. A current version of this document is only available electronically from the Hospitals. If this document is printed, it is only valid to the date of printing.