Procedure


Purpose

This procedure provides an Emergency Management Plan for children who have had a disruption to their regular Parenteral Nutrition (PN) while at home.

Scope

This procedure pertains to all children undergoing home parenteral nutrition who present to the emergency department and who are at increased risk of:

- Sepsis due to indwelling device
- Hypoglycaemia due to abrupt cessation of PN
- Dehydration due to stoma losses / abnormal gut
- Central Venous Access Device (CVAD) disruption (cracked, blocked, or dislodged line).

*These may occur concurrently*

ALERT

Children with “short gut” who present with a fever are much more likely to have a sepsis related to the CVAD as the cause of their presentation.

To differentiate systemic sepsis and causative organisms from a colonised CVAD, it is desirable to have a peripheral blood culture.

In the initial management, peripheral venous access should be attempted by the most experienced doctor available.

Timely venous access via the CVAD for blood collection, administration of IV fluids or antibiotics should not be delayed by more than a few minutes if the search for peripheral access proves futile.
Procedure

Clinical presentation

Children may present to the emergency department with:

- Fever $\geq 38.0^\circ C$, clinical evidence of infection
- Hypoglycaemia
- Increased stoma losses, severe diarrhoea / vomiting
- CVAD problems

All children should have individualised Emergency Plans. These may be found in their Hospital Records, at triage in Emergency Department, and/or with the parents.

Emergency management

Triage

At triage, these children should be allocated an Australian Triage Scale (ATS) category of at least 3 to ensure rapid management.

If the child is febrile, has an altered level of consciousness (drowsy or irritable), has respiratory or circulatory compromise, or is known to be hypoglycaemic, they should be allocated an ATS category 2 and escorted to Red Zone where assessment and treatment will commence within ten (10) minutes of arrival to Emergency Department.

If the child requires immediate medical assessment and intervention an ATS category 1 will be allocated.

Observations

These children require (as a minimum) measurement and recording of temperature, pulse rate, respiration rate, blood pressure, oxygen saturations, blood glucose level (BGL) and weight.

Initial assessment and resuscitation (if required)

- Assess & Resuscitate using ‘ABC’ approach
  - Ensure the most senior doctor is aware of the need for resuscitation
  - A: Provide high flow oxygen as needed
  - B: Support ventilation as required
  - C: Obtain peripheral access (or intra-osseous access in certain circumstances) and treat signs of shock with IV 0.9% sodium chloride in 20 mL/kg boluses

- Treat hypoglycaemia initially with IV 10% Glucose 2 mL/kg & recheck BGL

Fever $\geq 38.5^\circ C$ or clinical evidence of systemic infection

Diagnostic testing:

Take blood for:

• Blood cultures (CVAD and peripherally, wherever possible). All lumens should be cultured in a multiple lumen device
• Full blood count (FBC), Electrolytes and liver function tests (ELFTs -CHEM20), C-reactive protein (CRP)
• Blood glucose level (BGL)
• Culture urine if clinically indicated

**Treatment:**
• Start antibiotics: Piperacillin/tazobactam IV 100mg/kg (piperacillin component) every 6 hours (max 4gram per dose) and Vancomycin IV 15mg/kg every 6 hours (max 500mg/dose)) preferably after blood cultures have been obtained through peripheral and CVAD
• Aim to commence antibiotics within one (1) hour of arrival to Emergency department
• Commence IV fluids: 0.9% sodium chloride with 10% glucose at maintenance rate.
• Use CVAD for antibiotics unless becomes shocked, rigors or “septic” on flushing or accessing the CVAD.
• Do not use the CVAD for PN without discussion with the home team, unless peripheral access is not achievable and the patient is shocked, dehydrated or hypoglycaemic
• Inform the home / on-call team of patient’s admission.

**Dehydration / Increased stoma losses**

**Diagnostic Testing:**
• Take blood for:
  o FBC, ELFTs (CHEM20), CRP
  o BGL
  o Blood cultures from CVAD and peripherally (if possible)
  o N.B. All lumens should be cultured in a multiple lumen device
• Send stools for microscopy and culture including viruses

**Treatment:**
• Assess clinically for dehydration
• Consider additional fluid replacement if clinical evidence of dehydration or if significant weight loss
• Stop all enteral feeding (both oral and gastrostomy)
• Inform home / on-call team of patient admission

**Disruption to Central Venous Access Device (CVAD) (cracked, blocked, or dislodged line)**

**Diagnostic Testing:**
• Take peripheral blood for:
• Blood cultures
• FBC, CRP, ELFTs (CHEM20)
• Monitor BGL
Treatment:

- If afebrile: prescribe empiric single dose prophylactic antibiotic via peripheral cannula, Vancomycin IV 15mg/kg (to a maximum of 500mg) once only
- If febrile (Temp >38°C): change antibiotic prophylaxis to empiric treatment, commence Vancomycin IV 15mg/kg (to a maximum of 500mg) every 6 hours with Piperacillin/Tazobactam (Tazocin ®) IV 100mg/kg (piperacillin component) every 6 hours (to a maximum of 4gram/dose)
- Clamp the CVAD and DO NOT USE
- Commence IV fluids: 0.9% sodium chloride with 10% glucose at maintenance rate through the peripheral IV line
- DO NOT use the peripheral line to administer PN
- In hours: contact NP Paediatric Vascular Assessment and Management
- After hours: refer to CHQ Procedure 03455 for emergency management of fractured tunnelled cuffed catheters
- Inform treating team / on call team of patient admission.

Line repair kits

- Children should present with a line repair kit. If not, an appropriately-sized kit may be obtained by contacting Nurse Manager Patient Flow and Staffing Unit (PFSU)
- Only clinicians trained in line repair should use the line repair kits. The NP Paediatric Vascular Assessment and Management, Oncology staff & some nurses throughout various wards within the hospital, including Department of Emergency Medicine (DEM) staff have undertaken the appropriate training and have been credentialed to do so. The Nurse Manager, PFSU will have an up to date list of these staff members and will also provide information on which staff members are currently on shift and most likely to assist.
- Resources maintained within Nurse Manager Patient Flow and staffing Unit (PFSU) include:
  - Datasheet to ensure all fractured catheters are captured
  - Copy of CHQ 03455 Procedure Management of a Fractured Tunnelled Cuffed central Venous Catheter (tc-CVC)
  - Step by step written and pictorial guide for repair of fractured tc-CVC
  - USB with DVD guiding the registered nurse through the steps of repair of fractured tc-CVC
  - 2x 4fr and 6fr single lumen tc-CVC
  - 2x 7fr double lumen tc-CVC
  - List of consumables required to complete repair procedure

All children who present to Emergency Department should be discussed with their CHQ Home Team prior to leaving the department for admission or discharge.
Key contacts

<table>
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<tr>
<th>Position (Contact all staff via Switchboard)</th>
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<tbody>
<tr>
<td>Paediatric Gastroenterologist / Fellow</td>
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<td>• Mon-Fri (0800-1700)</td>
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<td>• Afterhours: page through switch</td>
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<tr>
<td>Clinical Nurse (CN) Gastroenterology (GE) Support</td>
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<tr>
<td>Nurse Practitioner (NP) Paediatric Vascular Assessment and Management</td>
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<td>Nurse Manager, PFSU</td>
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<tr>
<td>Pharmacy Department</td>
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<td>• Afterhours: page on-call Pharmacist through switch</td>
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Supporting documents

- CHQ Procedure 03455 - Management of a Fractured Tunneled Cuffed Central Venous Catheter

Consultation

Key stakeholders who reviewed this version:
- Staff Specialist, (GE Unit CHQ)
- Infectious Diseases Consultant, (IMPS, CHQ)
- Director, Paediatric Emergency Medicine, (CHQ)
- Director of Pharmacy, (CHQ)
- Nurse Practitioner, Paediatric Vascular Assessment and Management (CHQ)
- Clinical Nurse Gastroenterology Support, (GE Unit CHQ)
- Antimicrobial Stewardship Pharmacist (CHQ)

References and Suggested Reading

Audit/evaluation strategy

<table>
<thead>
<tr>
<th>Level of risk</th>
<th>High if mitigation strategies not taken</th>
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<tbody>
<tr>
<td>Strategy</td>
<td>Incidents reported by PRIME monitored and managed by NUM in conjunction with NP Paediatric Vascular Assessment and Management, Gastroenterology Support and Nursing Director. Children on Home PN who present to DEM are reviewed by CN Gastroenterology Support. BSI / 1000 catheter days</td>
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<td>Audit/review tool(s) attached</td>
<td>Nil</td>
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<td>Audit/Review date</td>
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<td>NP Paediatric Vascular Assessment and Management</td>
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<td></td>
<td>CN Gastroenterology Support</td>
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<tr>
<td>Key elements / Indicators / Outcomes</td>
<td>100% of children on Home PN have repair kits</td>
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<tr>
<td></td>
<td>100% of children on home PN who present to DEM are treated in accordance with this Procedure</td>
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Procedure revision and approval history

<table>
<thead>
<tr>
<th>Version No.</th>
<th>Modified by</th>
<th>Amendments authorised by</th>
<th>Approved by</th>
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<tbody>
<tr>
<td>1.0</td>
<td>Nurse Educator, Department of Emergency Medicine</td>
<td>• District Nursing Governance Committee</td>
<td>General Manager Operations</td>
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<td>• Executive Critical Care Division, RCH; DDNS</td>
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<td>2.0</td>
<td>• Staff Specialist, GE Unit CHQ</td>
<td>Medicines Advisory Committee (MAC)</td>
<td>General Manager Operations</td>
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Keywords

- PN, parenteral nutrition, TPN, short gut, 01052

Accreditation references

- EQuIP National Standards (11-15): Standard 12 – Provision of Care