

## NEONATAL CLINICAL PRACTICE GUIDELINE

### Title: Management of Peripheral IV Access Devices and Extravasation Injuries in Neonates

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1 of 6

**Approved by:**  
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#### 1.0 PURPOSE AND INTENT

- 1.1 To provide for safe and effective management of peripheral intravenous (IV) devices in neonates.
- 1.2 To provide appropriate treatment recommendations and for neonates with infiltration or extravasation of IV fluid into the interstitial space.

*Note: All recommendations are approximate guidelines only and practitioners must take in to account individual patient characteristics and situation. Concerns regarding appropriate treatment must be discussed with the attending neonatologist.*

#### 2.0 PRACTICE OUTCOME

- 2.1 Prevention of extravasation of peripheral IV devices and minimize the complications when extravasation occurs, including infection and tissue necrosis which can lead to loss of limb function.

#### 3.0 DEFINITIONS:

- 3.1 **Extravasation:** Inadvertent administration of vesicant medication or solution into the surrounding tissue.
- 3.2 **Infiltration:** the inadvertent administration of non-vesicant medication or solution into the surrounding tissue.
- 3.3 **Interstitial:** Any type of fluid in the interstitial space or the space between tissue layers and outside of the vein.
- 3.4 **Occlusion:** Blockage that stops the passage of infusate or normal saline flush into the lumen. Often accompanied by an increase in pressure reading on the IV pump.
- 3.5 **Vesicant:** any medication or fluid with the potential for causing blisters, severe tissue injury, or necrosis if it escapes from the venous pathway. See Appendix B for a list of commonly used vesicants.

#### 4.0 GUIDELINES:

- 4.1 Peripheral IV devices are inserted using the procedure and principles outlined in the education packages HSC: "[Venous Access in Pediatrics](#)" and the HSC policy 80.140.042 "[IV Therapy: Central, Peripheral, Subcutaneous](#)" and Elsevier "[Clinical Skills](#)" online resource.
  - 4.1.1 Special consideration in site selection for infants: Avoid veins of the wrist as the close proximity to nerves in the area makes it difficult to avoid damage.
- 4.2 Documentation:  
Following an IV insertion, document the following information in the patient record:
  - Date and time of procedure.
  - Gauge and type of access device used.
  - Site of insertion.
  - Patient's tolerance of the procedure.
  - type of solution, additives and rate of infusion

- 4.3 Monitoring:  
Observe all IV infusion sites hourly and PRN for signs of phlebitis, occlusion, infiltration, and extravasation injury. IVs with hyperosmolar IV solutions such as sodium bicarbonate must be monitored more frequently, at least every 10-15 minutes. Grade for severity and manage interstitial IVs according to the guidelines below:
- 4.4 When occlusion or infiltration is suspected but not immediately evident:
- Stop the infusion
  - Attempt to flush the catheter with normal saline in a 3-5 mL syringe.
  - If the catheter does not flush easily, remove it and treat as an infiltration as outlined below.
- 4.5 Management of infiltration or extravasation:
- 4.5.1 If phlebitis or infiltration is overtly evident, discontinue infusion immediately.
- 4.5.2 Carefully remove the IV dressing and IV device if not already removed.
- 4.5.3 Gently squeeze out excess IV fluid.
- 4.5.4 Follow the guidelines below:

Grade One	Grade Two	Grade Three	Grade Four
<ul style="list-style-type: none"> <li>• Blanching or redness</li> <li>• Mild edema</li> <li>• Fluid leaking from insertion site</li> </ul>	<ul style="list-style-type: none"> <li>• Significant blanching or redness</li> <li>• Significant edema, cool to touch</li> <li>• Obvious pain</li> <li>• Distal to site</li> <li>• decreased or absent pulse distal to site</li> </ul>	<ul style="list-style-type: none"> <li>• Skin blanched and translucent</li> <li>• Significant edema</li> <li>• Skin cool to touch</li> <li>• Delayed capillary refill distal to site</li> </ul>	<ul style="list-style-type: none"> <li>• Skin discolored with skin breakdown, blistering or necrosis</li> <li>• Significant edema</li> <li>• Pain at site</li> <li>• Prolonged capillary refill</li> </ul>
<ul style="list-style-type: none"> <li>• Observe the site for potential further injury or delay in evidence of skin breakdown.</li> </ul>	<ul style="list-style-type: none"> <li>• Inform medical staff</li> <li>• Consider hyaluronidase</li> </ul>	<ul style="list-style-type: none"> <li>• Within one hour administer hyaluronidase after obtaining a physician's order.</li> <li>• Consider topical nitroglycerine (with physician's order) if there is significant blanching.</li> <li>• Complete patient safety event report.</li> </ul>	<ul style="list-style-type: none"> <li>• As for grade three plus apply wound dressing according to the protocol listed in 4.6.</li> </ul>
<ul style="list-style-type: none"> <li>• Elevate limb but <b>do not</b> apply heat to the injured area. Observe hourly for signs of increased skin breakdown. If this occurs apply wound dressing if not already applied.</li> <li>• Continue monitoring injury and dressing until healing complete.</li> </ul>			

4.6 Wound care

4.6.1 Cleansing:

- Normal saline. Any wound swabs should only be taken after cleansing.

4.6.2 Moisture and autolytic debridement:

- Water-based wound gel (hydrogel).

4.6.3 Protection and Absorption:

- An absorptive layer such as Aquacel® can be placed directly over the wound to prevent any dressing from sticking to the wound and to absorb necrotic material as it softens.
- Cover with a hydrocolloid or clear acrylic dressing. A thin product conforms better with infant's small limbs. Use only enough to give approximately a 1 cm border around the

damaged area.

- 4.7 Assess dressings a minimum of q4h and prn for integrity and drainage.
  - 4.7.1 Replace dressing q 7 days or PRN if the dressing being saturated with exudate or is lifting significantly. A hydrocolloid will have a “swiss cheese” appearance when saturated. If the edges begin to lift they can be reinforced with a transparent dressing.
- 4.8 If there are signs of systemic sepsis such as fever or temperature instability etc, or local inflammation around the area of the wound, remove the dressing and assess for wound infection evidenced by purulent drainage and peri-wound erythema. Send wound swab after cleansing the wound bed with saline and consult wound and skin assessment team for a dressing protocol for an infected wound.

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## APPENDIX A

### Pharmacological Treatments for IV Extravasations

#### **Hyaluronidase:**

- Hyaluronidase is an enzyme that modifies permeability of connective tissue through the hydrolysis of hyaluronic acid – reduces edema and inflammation.
  - It is indicated for infiltration of dextrose and electrolyte solutions, TPN, many medications.
  - Hyaluronidase is contraindicated with extravasation of inotropes.
  - It has no effect for blood transfusion infiltrations.
  - There are no known adverse effects.
  - Dose: 1 ml of 15 u/ml solution reconstituted by pharmacist.
  - To Administer:
    - Prepare injury site with alcohol or sterile water.
    - Administer in one of 2 ways. The choice of method will depend on the area of the injury.
1. administer in 4 directions subcutaneously from the insertion site in the center of the injury out towards the edges, or;
  2. Inject in small amounts in 4 or more injections from the edges of the injury towards the center.
    - Swelling should begin to decrease within 15-30 minutes.
    - Fluid will leak from the site for up to 2 hours after injection. This release of fluid will decrease edema and inflammation and thus decrease the extent of the injury.

#### **Topical Nitroglycerin (if available for unit use):**

- Nitroglycerin causes vasodilatation.
- It is indicated especially when the infiltrate includes inotropic agents.
  - It should not be used for infants <32 weeks gestation.
  - Dose: 0.5 cm nitroglycerin 2% - use a very small amount.
  - To administer:
    - spread over area of decreased perfusion in the first hour after injury
    - Signs of systemic absorption include: hypotension, tachycardia, flushing, nausea.
    - Monitor blood pressure.

**APPENDIX B****Commonly Used Vesicants**

Calcium chloride (5.5%)

Calcium gluconate (10%)

Central venous nutrition

Dobutamine

Dopamine

Epinephrine

Glucose (&gt; 10%)

Mannitol (15%)

Penicillin

Phenytoin

Potassium chloride (7.45%)

Radiograph contrast media

Sodium bicarbonate (4.2%–8.4%)

Sodium chloride (10%)

Vancomycin

Vasopressin