INFILTRATION & EXTRAVASATION EVENTS (IEE)

Définitions

- **Extravasation**: The inadvertent administration of **vesicant infusate** into surrounding tissue instead of the intended vascular pathway
- **Infiltration**: The inadvertent administration of **non-vesicant infusate** into surrounding tissue instead of the intended vascular pathway
- **Vesicant**: An agent which, in the event of extravasation, has the potential to cause tissue damage which may lead to blistering, tissue necrosis, and damage to underlying structures
- **Compartment Syndrome**: occurs as a result of increased pressure in the osseofascial compartment compromising blood flow to underlying structures leading to limb threatening ischemia. Symptoms are: increased pain, pallor, paresthesia (numbness or tingling), faint (or absent) pulses, altered mobility of affected limb

Key points

- **Cold and warm compresses should NOT be used in the NICU setting**
- **IEEs are less likely to occur with CVADs**. Clinical signs and symptoms for an IEE involving a CVAD may take longer to develop due to the depth of the catheter. Regardless of the IEE's severity, a **physician/NP should be notified when a CVAD is involved.**
- The full extent of **tissue damage can appear 24 to 72 hours** after IEE depending on infusate.

Materials - Extravasation kits

- (where will they be found?)

- (4) Sterile 4X4 gauze
- (4) sterile 2x2 gauze
- (3) 10mL NaCl (0.9%) pre-filled saline syringes such as BD Posiflush™
- (1) Paper measuring tape
- (2) Silicone-based contact layer (e.g. Adaptic Touch™) – 7.5cm x 10cm
- (1) Non-adhesive foam dressing with border - 7.5cm x 7.5cm (e.g. Allevyn Gentle Border Lite™ or Mepilex Border™)
- (1) Non-adhesive foam dressing with border – 10cm x 10cm (e.g. Allevyn Gentle Border Lite™ or Mepilex Border™)
- (1) DuodermTM extra thin dressing (10cm x 10cm) or (1) TegadermTM transparent film dressing (6cm x 7cm) for nitroglycerine patch application
- (1) Roll of silicone tape (e.g. Mepitac™)
- (1) Conforming stretch gauze bandage (2" roll) (i.e. cling)
- (1) Sterile scissors
- (1) Clinical extravasation protocol
- (1) Neurovascular signs sheet (DM-3357)
- (1) Wound Assessment Record (DM-1626)
- (1) AH-223 form (Incident Report)
- (1) Consent for photographs, audio, video recordings (DM-2878)

Procedure - Determining if there is an infiltration/extravasation

- Touch Look Compare (TLC)

- The TLC method should be used when assessing all infusing VAD sites
  - minimum Q 60 min
  - frequency of monitoring should be adjusted based on the infusate risk category (refer to Appendix C)
    - *red (increase to Q 30 min minimum if infused through peripheral veinous access)*
    - *yellow*
    - *green*

- Suspect IEE if one or more following signs and symptoms:

- Patient **irritability**
- **Complaints of pain**, burning, or stinging at the site of infusion (during flushing or infusion)
- **Leaking** of infusate around insertion site
- **Swelling or induration** of the infusion site
- Presence of **redness, blanching, hematoma, or blistering**
- **Change in temperature** in affected limb
- **Altered vascular flow** in affected limb (e.g. decreased capillary refill, weak/absent pulse)
- **Inability to flush catheter** with ease

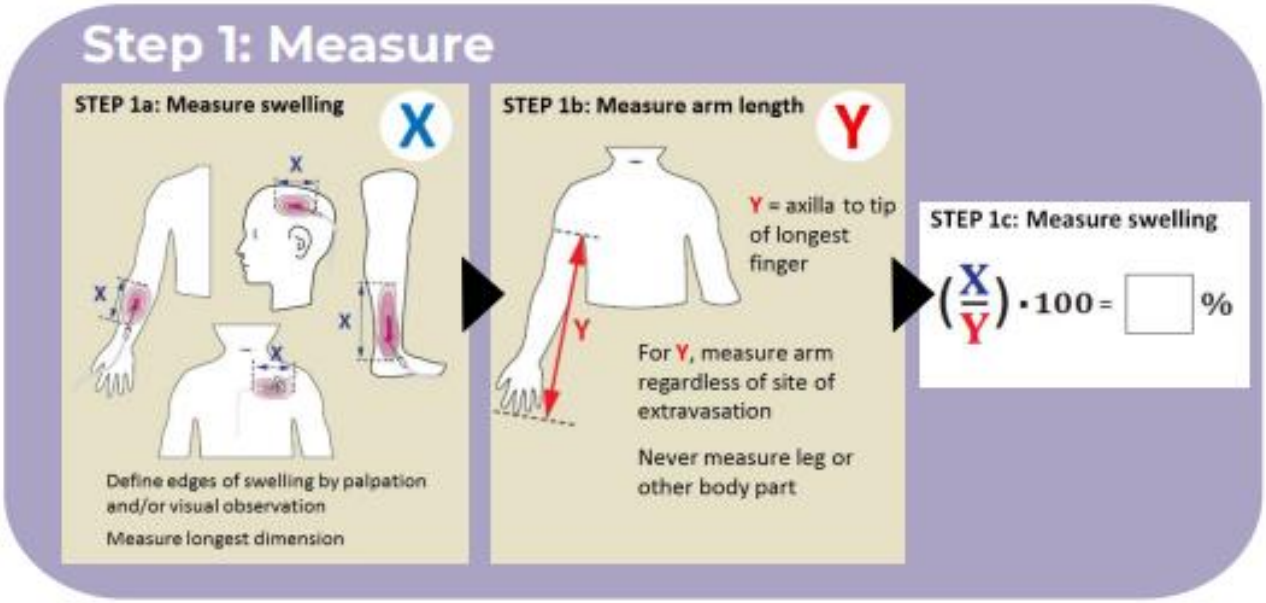
- If IEE is confirmed: SLAP interventions
  - Removal of CVADs should ONLY be done by a physician/NP
  - Use of the affected site for further IV access is not recommended

1. **S**top the infusion
2. **L**eave the vascular access device (VAD) in place but expose limb and remove constrictive bands (e.g. tape, splints, identification bracelet, clothing, etc.)
3. **A**spirate fluid from VAD using 3 or 5 mL empty syringe (a smaller syringe will exert more pressure and possibly remove more infiltrated fluid). **Do NOT flush**.
4. **P**ull out VAD - CAREFULLY remove transparent film dressing, tape or securement devices (only for PIV, arterial catheter) - **DO NOT apply pressure to site**

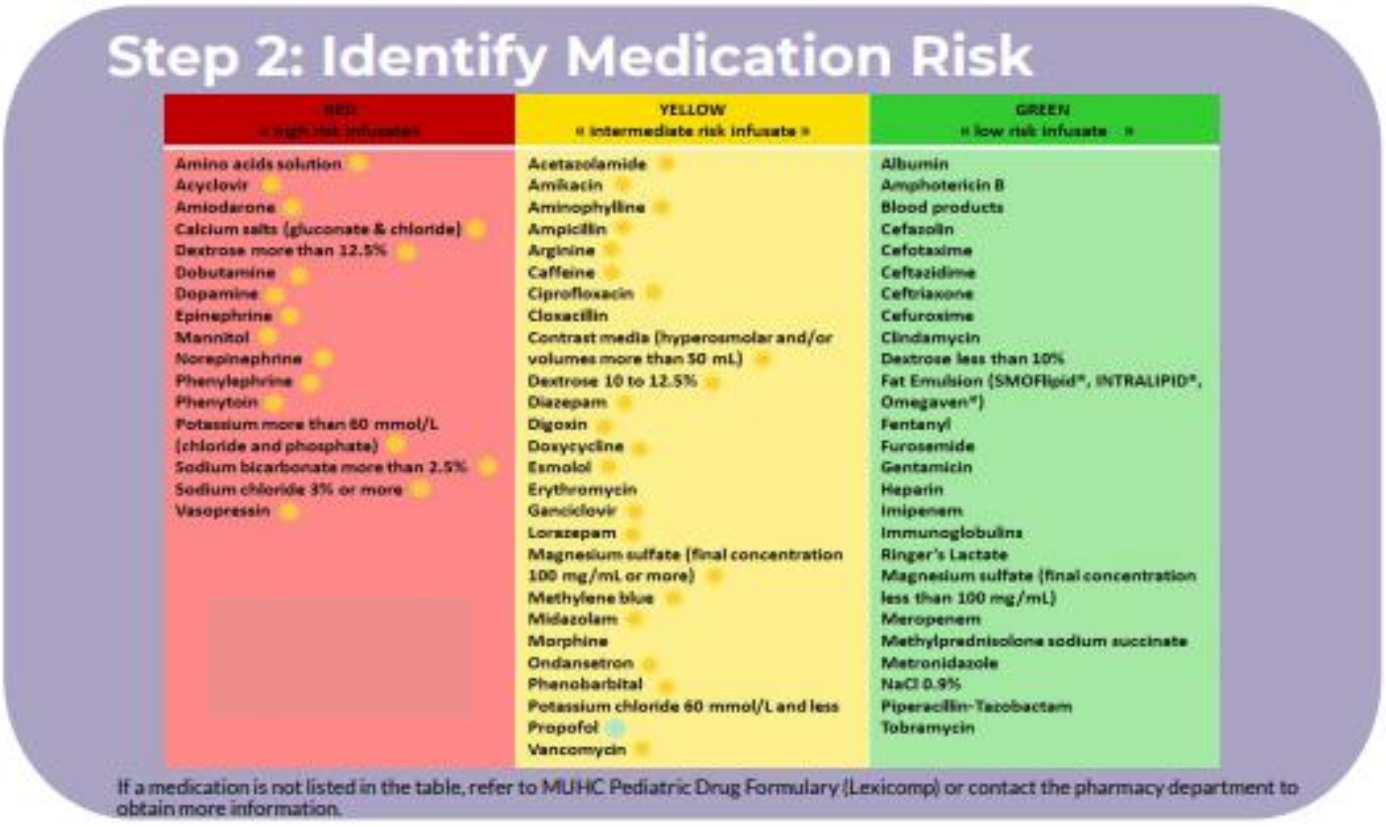
Procedure - Assessment and management of site

- Determine severity of IEE

- Complete initial **neurovascular assessment**. If pulses are difficult to locate, consider doing a Doppler assessment.
- **Measure swelling** of affected area and **calculate percentage of limb affected**.



- Determine extravasation **risk of infiltrated intravenous fluid/medication**



- Notify physician or Nurse Practitioner (NP) of IEEs involving any of the following

- **30% or more** of the affected limb or area
- Infusion of intravenous **fluid or medication from the Red/Yellow List**
- **Infusion of vasoconstrictor** agent
- **Alterations in skin integrity or neurovascular signs** in the affected limb
- **IEE related to a CVAD, arterial or IO infusion**

  - Assessment by MD or NP should be done within 15 minutes of injury to optimize administration of antidote if needed.

- Elevate limb

- **Elevate the limb** whenever possible **to the level of heart or above** using pillows or blankets for the first 48 hours after injury, or until edema is resolved
- Occupational therapy (OT) and physiotherapy (PT) may be consulted to help with limb elevation

- Assess the affected area

- **Neurovascular signs**
  - To be done on all IEEs involving infusion of intravenous fluid/medication from the Red or Yellow list and/or infusion of vasoconstrictor medication
  - To be done on IEEs with Green list intravenous fluids/medications affecting 30% or more of a limb
- **Assess IEE site every 15 minutes for the first 2 hours and then at least every care** for signs of deterioration
  - Increased frequency of assessments will be required if there is suspicion of compartment syndrome

- Determine the need for the administration of an antidote

Swelling to affected area	RED « high risk infusate»	YELLOW « intermediate risk infusate »	GREEN « low risk infusate »
Less than 30%	Antidote may be required, if: • Skin breakdown, blisters • Circulation impairment • Administration of vasoconstrictor agents	Antidote NOT required	Antidote NOT required
Between 30-60%	Antidote required	Antidote may be required, if: • Skin blanched, taut • Circulation impairment	No antidote indicated
More than 60%	Antidote required	Antidote required	No antidote indicated At discretion of MD/NP

- The use of an antidote requires a prescription. **All antidotes should be administered by a physician/NP**
- For some antidotes, better efficacy was shown if used within 1 to 2 hours following the IEE, however, the use of an antidote can still be beneficial if used within 12 hours.
- The use of an antidote should be strongly considered when: More than 30% of the area or affected limb is swollen AND involves an intravenous fluid/medication from the Red List
  - **IF ANTIDOTE IS NEEDED: consult Management of infiltration and extravasation in the neonatal and pediatric patient, excluding chemotherapy and biotherapy agents' protocol on Weebly**

- Provide adequate pain management

- IEEs **can be very painful**. Pain should be assessed using a validated developmentally appropriate pain scale, and pharmacological agents should be administered as needed
- Non-pharmacological techniques (e.g. sucrose, bundling/positioning, distraction, breastfeeding, etc.) should always be considered as an important component of pain relief in conjunction with pharmacological interventions.

- Consider consultation with one or more of the following specialties

- Wound Care nurse, Physiotherapy, Occupational Therapy, Acute Pain Service, Plastic Surgery (for IEE with questionable soft tissue viability or suspected consequences to sensory and/or motor function), Pharmacy, Nutrition when involving parenteral nutrition.

- Consider photo documentation

- A picture of the injured area should be taken for clinical records and for monitoring the evolution of the wound (if present), following *MUHC Policy: Collection, use, disclosure and retention of photos taken by staff*. Consent must be obtained in order to take a photo.

- Wound Assessment and Care

- A **Wound Assessment Record sheet** (DM-1626) should be filled out for any skin injury requiring treatment or follow-up
- It is **not recommended to apply a dressing** on the IEE site **while waiting for** MD/NP and/or Wound Care **assessment**
- Once the IEE has been assessed by MD/NP and/or Wound Care, proceed with application of dressing
- Dressings should be changed daily until the clinical presentation of the IEE has stabilized (24 to 72 hours)

Clinical Intervention	Rationale
Clean affected area with 0.9% NaCl	
Select appropriate dressing:	
If blisters are localized (ruptured and/or intact):	
Leave blisters undisturbed (if intact), if ruptured keep "skin flap" in situ	Act as 'biological dressing', reduces risk of infection
Apply silicone based foam dressing (e.g. Allevyn Gentle Border Lite™ or Mepilex Border™). DO NOT adhere silicone border directly to blisters (ruptured and/or intact)	Optimizes wound healing in moist environment, absorption of wound exudate and atraumatic dressing removal
If blisters are dispersed throughout the IEE site (i.e. do not fit underneath the silicone-based foam dressing):	
Leave blisters undisturbed (if intact), if ruptured keep "skin flap" in situ	
Apply Silicone-based contact layer (e.g. Adaptic Touch™)	Facilitates atraumatic dressing removal if blisters spontaneously rupture
Cover with sterile dry dressing (e.g. gauze)	
Loosely wrap with cling	Wrapping MUST be loose to avoid tourniquet effect Placing tape around the circumference of the limb may cause a tourniquet effect, compromising blood circulation/perfusion to the limb
Secure with silicone based tape. Avoid placing tape in circumferential (horizontal) manner around the limb	
NOTE:	
Avoid application of tulle-gras products (e.g. Bactigras) on all regions affected by IEEs (intact or ruptured blisters)	Tulle gras products (e.g. Bactigras™) are associated with increased adherence to the wound bed and bleeding after removal. Therefore, lipidocolloid products (e.g. Adaptic Touch™) should be the product of choice to promote atraumatic removal, optimize patient compliance and reduce pain.

Documentation

- **Time of event**
- **Type and estimated volume of infiltrated intravenous fluid/medication**, including ALL intravenous fluids and/or medications infused in the VAD over the last 2 hours.
- **Measurements of IEE**
- **Assessments of the VAD site before the IEE**
- Documentation of **any skin breakdown or injury** requiring treatment or follow-up using the Wound Assessment Record sheet
- **Neurovascular assessment** using the Neurovascular vital signs sheet
- **Interventions** as stipulated in the present protocol (ex: initiation of compresses, limb elevation, who was notified, administration of antidote, etc.)
- **Therapeutic Nursing Plan** must be updated
- **Signed Consent for photographs** (DM-2878) if a picture was taken
- Administration of **antidote on the STAT Medication Administration Record** (DM-1607) if applicable
  - *Name of antidote – concentration and dosage/volume administered*
  - *Number of injection sites*
  - *Time and date*
  - *MD/NP initials*
- **Patient and family teaching** about care of affected limb (if applicable)
- **Photo documentation**: Document in progress note date that photographs were taken and where they will be stored (i.e. name of clinician, or department) to facilitate retrieval from medical records
- **Complete Incident Report** (AH-223) for ANY IEEs regardless of severity. NOTE: It is very important to identify the IEE in section 4 of the Incident Report form as an "erreur de traitement/intervention" and "infiltration/extravasation" – please refer to the red boxes indicated on the incident report in Appendix G.