



Team Name: Pharmacy & Therapeutics  Team Lead: Regional Director - Pharmacy  Approved by: VP - Medical Services	Reference Number: CLI.6010.SG.003  Program Area: Pharmacy & Therapeutics  Policy Section: General
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**STANDARD GUIDELINE SUBJECT:**

Extravasation Management of Non-Chemotherapeutic Medications

**PURPOSE:**

To provide standards for the prevention of extravasations/infiltration and treatment should an incident occur

**DEFINITIONS:**

***Intravenous (IV):*** Injection into a vein

***Central Vascular Access Device (CVAD):*** A device that permits access to the central vascular system. A catheter is inserted with the tip residing in the lower one-third of the superior vena cava, or above the level of the diaphragm in the inferior vena cava

***Extravasation:*** The inadvertent infiltration of vesicant solution or medication into surrounding tissue

***Infiltration:*** The inadvertent administration of a non-vesicant solution or medication into surrounding tissues

***Vesicant:*** An agent capable of causing blistering, tissue sloughing, or necrosis when it escapes from the intended vascular pathway into surrounding tissue

**IMPORTANT POINTS TO CONSIDER:**

***Risk Factors:***

Any patient is at risk of extravasation/infiltration, but some individuals are a greater risk, including

- Older adults who tend to have more fragile veins and skin
- Children who tend to have small and deep veins, and who may be unable to express pain
- Patients on anticoagulants or corticosteroids, which may cause the skin and veins to become fragile and bruise more easily
- Individuals who are unable to communicate because they are sedated, unconscious, had surgery to the head and neck region or are unable to speak
- People with chronic diseases such as cancer, cardiovascular disease or diabetes and who tend to have fragile and damaged veins

- Device related with placement in an undesirable location (antecubital fossa, dorsum of hand, wrist, areas of flexion/movement-prone areas)
- Health care professional related (lack of IV insertion skills, probing during IV insertion, interruptions/distractions during administration)
- Specific drug characteristics (hypertonicity, nonphysiologic pH, high concentration, drugs that produce vasoconstriction and tissue ischemia and intrinsic or direct cytotoxic effects)

***Prevention:***

- Extravasation/Infiltration is a risk associated with the intravenous administration of medication
- It is important to understand where to insert a cannula (avoid areas of flexion) if using a flexion site immobilize extremity
- Chose the smallest catheter capable of delivering the prescribed therapy. If possible, small catheter large vein
- Longer dwell times pose an increasing risk of fluid escape therefore giving a vesicant may require a new catheter insertion
- Recognize a through puncture, at-risk patients, and the signs and symptoms of the condition
- Measures such as appropriate dilution of medication
- Know the pH and osmolarity of I.V. drugs. Short peripheral catheters should be used for drugs with
  - pH between 5 and 9
  - osmolarity less than 600 mosm/L
- Infusion of medication via the appropriate rate of administration
- Careful monitoring of infusions as they are being administered
- Use of clear dressings and visibility ease to allow for inspection of infusion site
- Listen to client complaints, IV medications should not cause pain
- For clients who are unable to communicate (e.g. unconscious, dementia, paralyzed) infusion sites will require a more frequent and diligent assessment

***Signs and Clinical Significance:***

The Health care professional must frequently assess the peripheral cannulation site and the surrounding tissue for any signs and symptoms of possible extravasation/infiltration. For CVAD infusions, assess areas of neck, chest and shoulder. These may occur immediately after the blood vessel has been breached and may include:

- Changes in sensation or pain
- Changes in infusion quality (free flowing IV slowing down)
- Swelling at the cannulation site or along the vein pathway
- Induration
- Erythema
- Venous discoloration/blanching
- Absence of blood return
- Increased resistance when administering IV drugs
- Inflammation or blistering

An understanding of which drugs are likely to cause tissue damage can ensure that if the drug leaks out, the health care professional can act promptly to minimize any possible damage

**PROCEDURE:**

***Nursing:***

- See attached Extravasation Management Flow Chart CLI.6010.SG.003.SD.02
- Specific courses of action depend upon the nature of the drug, how much was extravasated, and the location of the extravasation
- If an extravasation is suspected, treatment must begin as soon as possible. Early detection and management within 24 hours can significantly reduce tissue damage. However in some cases extravasation may only become apparent after 1 to 4 weeks

- For most medications, the treatment of extravasation is **non-pharmacologic** in nature. The recommended approach to the treatment of extravasation includes the following steps:
  - Stop the intravenous bolus or infusion immediately if the patient admits to a burning sensation or complains of pain to help lower the concentration of the drug in the area
  - Explain to the patient what you suspect has happened and the procedure as deemed appropriate
  - The catheter/cannula should not be removed immediately, but should be left in place to attempt aspiration of the fluid from the extravasated area. Aspiration may help to reduce the size of the injury caused by extravasation, however in practice; it may achieve little and may distress the patient further as it can cause local discomfort at the site
  - Try to gently aspirate as much of the drug as possible from the IV tubing and cannula with a 3-5 mL luer lock syringe. NOTE: NEVER FLUSH IV LINE
  - Mark around the affected area with an indelible pen
  - Estimate the volume of fluid that has escaped into the tissue based on the rate of injection or infusion and the length of time since the last assessment. Large volumes (eg. greater than 25-50 mL) of escaped fluid increase the risk of tissue damage, and consultation with a plastic surgeon may be required
  - Contact prescriber and pharmacist (when available)
  - If an antidote is appropriate and available, leave peripheral catheter in situ. If not appropriate and or unavailable, remove peripheral catheter
  - Apply gentle pressure with gauze to suspected extravasation site. Avoid excessive pressure to the site to avoid further extravasation of medication into the tissue
  - Elevate the limb to minimize swelling. Typically, elevation is recommended for the first 48 hours after the extravasation
  - Apply warm OR cold compresses whatever is most comfortable for the patient:
    - Cold compresses
      - help relieve some of the pain and inflammation with the extravasation and also prevent the spread of the damaging substance to adjacent tissues
      - should be applied for 15 to 20 minutes at least 4 times a day for the first 48 to 72 hours after the extravasation has occurred
      - cold compresses are recommended for the treatment of contrast media extravasation
    - Warm compresses
      - promotes healing through vasodilation of the veins. It may also decrease local drug concentration by increasing the blood flow and enhancing resolution of pain and reabsorption of fluid to reduce local swelling
      - should be applied for 15 to 20 minutes at least 4 times a day for the first 48 to 72 hours after the extravasation has occurred
      - recommended for the treatment of some non-cytotoxic drugs, such as calcium gluconate
      - moist heat is not recommended because it can cause maceration and may further damage already compromised skin

**Prescriber:**

- Pharmacologic Treatment (Antidote)
  - The goal of antidote administration is to reverse the action of the extravasated agent, interfere with process of cell destruction, prevent tissue necrosis, or limit the extent of tissue damage
  - The efficacy of antidotes is unknown
  - Administration of injectable antidotes (if not performed via the cannula) is by the pincushion technique, whereby small volumes of the antidote are instilled around and over the areas affected by extravasation
  - The procedure may cause discomfort and if large areas are to be treated then analgesia should be considered before the procedure commences

Extravasated Medication	Antidote
Sympathomimetics: DOBUTamine DOPamine EPINEPHrine norepinephrine vasopressin	<b>phentolamine</b> 5 to 10 mg diluted in 10 to 15 mL of normal saline. Inject subcutaneously with a fine hypodermic syringe into the area of extravasation. Phentolamine should be given as soon as possible, within 12 hours of extravasation.

**Report extravasation appropriately:**

- See Extravasation Management Documentation CLI.6010.SG.003.SD.03
- Any incidence of extravasation must be reported and documented, particularly as the patient may require follow-up care
- An Occurrence Report form as well as specific extravasation documentation should be completed
- All information related to the event should be included in the patient's health record to provide an accurate account of the event
- Key elements of vesicant extravasation documentation
  - Date and time the extravasation occurred
  - Type and size of vascular access device
  - Length and gauge of cannula
  - Location of device
  - Details of how patency was established before and during administration
  - Number and location of all cannulation attempts
  - Vesicant administration method, for example bolus or infusion
  - Estimated amount of extravasated drug
  - Symptoms reported by the patient
  - Description of site, for example swelling
  - Assessment of the limb (where applicable)
  - Immediate nursing interventions
  - Follow-up interventions
  - Patient information (See Extravasation Management Patient Information CLI.6010.SG.003.SD.04)
  - Photographs of extravasation site (with regionally owned device)

**IMPORTANT POINTS TO CONSIDER:**

- Patients should always be informed if extravasation occurs and given comprehensive information about what is involved in the treatment and management of the condition
- Information should be provided to patients with instructions on what symptoms to look out for and when to contact the hospital during the follow-up period. Give handout (Extravasation Management Patient Information [CLI.6010.SG.003.SD.04](#))

**EQUIPMENT/SUPPLIES ARE:**

- two gel packs – one to be kept in the fridge and one available for heating
- 2 mL syringes
- 25 gauge needles
- alcohol swabs
- phentolamine 10 mg/mL (FRIDGE)

**SUPPORTING DOCUMENTS:**

- [CLI.6010.SG.003.SD.01](#) Extravasation List of Irritant Drugs
- [CLI.6010.SG.003.SD.02](#) Extravasation Management Flow Chart

[CLI.6010.SG.003.SD.03](#) Extravasation Management Documentation  
[CLI.6010.SG.003.SD.04](#) Extravasation Management Patient Information

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