Health Sciences North
Horizon Santé-Nord

PHARMACY

PROCEDURE

CATEGORY: System-Level Clinical
ISSUE DATE: April 2013 **REVISION DATE:** March 2019
SUBJECT: **NON-CYTOTOXIC – MANAGEMENT OF EXTRAVASATION**

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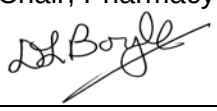
Approval: Dr. David Boyle Chair, Pharmacy & Therapeutics Committee 	**Date:** June 5, 2019

PURPOSE

To prevent or reduce potential tissue damage in the event of extravasation involving non-cytotoxic agents.

PROCEDURE

Special Instructions

- Extravasation of vesicant and irritant drugs can result in severe tissue damage.
- For extravasations involving chemotherapy, please refer to the *Chemotherapy - Management of Extravasation* procedure.
- In the event of a mixed extravasation of agents from different classifications:
  - **Different classification:** Vesicant is a priority over an irritant
  - **Same classification:** Those requiring a cold compress take precedence over applying a warm compress. A cold compress should be applied first.

Method

1. Stop drug administration immediately.
2. Disconnect the IV tubing from the IV device. **Do not remove the catheter.** Leaving the catheter in place may facilitate removal of some of the infiltrated medication and provide an injection site for the antidote.
3. Notify the physician immediately in order to obtain treatment orders.
4. Identify the infiltrated agent and determine appropriate treatment measures.
5. Document the diameter of the edematous area by measuring the two largest lengths in centimeters. Outline the area with indelible marker.
6. If a photograph of the site is required, contact the medical photographer and obtain consent.
7. Cleanse the connector between the extension set and administration tubing with appropriate cleansing agent.
8. Attach a syringe to the catheter (preferably a 5 mL size or greater).
9. Attempt to aspirate as much of the drug as possible using the syringe.

10. If a subcutaneous bleb is still present, the physician (or specially-trained RN in Critical Care and Oncology units) will aspirate with a 25 or 27 gauge needle in an attempt to withdraw as much of the remaining solution as possible.
11. If the physician orders an antidote, administer via catheter (where applicable) as per **Appendix A and B**.
12. Remove the catheter.
13. Elevate and immobilize the limb.
14. Apply a warm or cold compress at the site of extravasation as per **Appendix A**.
    - A **warm compress** facilitates diffusion of the agent through the tissues. Put a dry, warm pack on the site for 30 minutes every 4 hours for 24 hours.
    - A **cold compress** limits diffusion of the agent into the tissues. Apply for 15 minute intervals as tolerated at least 4 times a day over a 24-48 hour period. Protect the skin from excess cold by covering the compress in cloth.
15. If ordered, apply the appropriate topical agent.
16. Observe the site and document your findings at 24 hours and 48 hours post-extravasation.
17. Dispose of all equipment.
18. Document the following information:
    - Date and time of extravasation
    - Size and type of catheter used
    - Insertion site
    - Sequence of drugs infused
    - Composition of flush solution
    - Drug administration technique
    - Management of extravasation
    - Patient signs, symptoms and response
    - Appearance and grade of site
    - Consultants who were notified (i.e. attending physician, pharmacist, surgeon, etc.)
19. Prior to discharge, inform the patient/caregiver that weekly observation is required for several weeks. Provide them with any necessary information regarding follow-up.

EDUCATION AND TRAINING

Definitions

1. Extravasation: Leakage of a medication into tissue or extravascular space around the infusion site. May be due to direct leakage from the venous access device or from elsewhere in the vessel (such as from previous phlebotomy).
2. Irritant: Medication that can cause local inflammatory reactions at the infusion site, which may include burning, swelling, pain, inflammation, tightness, or phlebitis.
3. Vesicant: Medication that may cause blistering and other tissue injury that may be severe and can lead to tissue necrosis (tissue death).

References and Related Documents

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Laurie SWS, Wilson KL et al. (1984). Intravenous extravasation injuries: the effectiveness of hyaluronidase in their treatment. Ann Plast Surg, 13(3): 191-194.

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APPENDIX A

Infiltrates and Antidotes

This is not a comprehensive list of all infiltrates.
For infiltrates not listed, consult references for more information.

Drug	Type	Antidote	Compress	Recommended Topical Agent
Acyclovir	Irritant	No specific antidote	Cold	No specific treatment
Aminophylline	Vesicant	No specific antidote	Warm	No specific treatment
Amiodarone	Irritant	No specific antidote	Cold	No specific treatment
Amphotericin B	Irritant	No specific antidote	Cold	No specific treatment
Calcium Solutions	Vesicant	Normal Saline 1-2 mL ***and/or*** Hyaluronidase	Warm	Topical Nitroglycerin
Cefotaxime	Vesicant	No specific antidote	Cold	No specific treatment
Dextrose greater than or equal to 10%	Vesicant	Hyaluronidase	Warm	Topical Nitroglycerin
Diazepam	Vesicant	Hyaluronidase	Warm	Topical Nitroglycerin
Digoxin	Vesicant	No specific antidote	Cold	No specific treatment
Dobutamine	Vesicant	Phentolamine	Warm	Topical Nitroglycerin
Dopamine	Vesicant	Phentolamine	Warm	Topical Nitroglycerin
Epinephrine	Vesicant	Phentolamine	Warm	Topical Nitroglycerin
Gadolinium-Based Contrasts (Omniscan, Multihance)	Irritant	No specific antidote	Cold	No specific treatment
Iodine-Based Contrasts (Omnipaque, Visipaque)	Vesicant	Hyaluronidase	Warm	No specific treatment
Norepinephrine	Vesicant	Phentolamine	Warm	Topical Nitroglycerin
Pamidronate	Irritant	No specific antidote	Cold	No specific treatment
Phenytoin	Irritant	Hyaluronidase	Warm	No specific treatment
Potassium Solutions	Vesicant	Hyaluronidase	Warm	No specific treatment
Propofol	Irritant	No specific antidote	Cold	No specific treatment
Sodium Bicarbonate	Irritant	Normal Saline 1-2 mL ***and/or*** Hyaluronidase	Warm	Topical Nitroglycerin
TPN Solution	Vesicant	Normal Saline 1-2 mL ***and/or*** Hyaluronidase	Warm	Topical Nitroglycerin
Vancomycin	Vesicant	Hyaluronidase	Warm	Elevate site
Vasopressin	Vesicant	Phentolamine	Warm	Elevate site

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APPENDIX B

Preparation of Antidotes and Topical Agents

Drug	Type	Population	Instructions	Special Notes
Hyaluronidase *Special Access Medication – must be obtained from Pharmacy*	Antidote	Adults	Reconstitute hyaluronidase solution to 150 units/mL: • Add 1 mL of 0.9% sodium chloride to the ampule of powder to make a 1500 units/mL solution. • Draw up 0.1 mL of this solution (150 units) into a 1 mL syringe and further dilute with sodium chloride 0.9% to obtain a total volume of 1 mL. • Prepare five syringes of 0.2 mL (each 0.2 mL contains 30 units of hyaluronidase; total dose is 150 units). • Using a 25 or 27 gauge needle, infiltrate the five syringes of antidote subcutaneously into the leading edge of the extravasation.	• Should be given within 4 hours of infiltration. • Is not for intravenous administration and should not be injected into tumours, acute inflamed or infected areas. • Has an immediate onset of action and 24-48 hour duration of effect. • Corticosteroids may worsen toxicity. • Cold compresses should be avoided as they can counteract hyaluronidase activity.
		Neonates and pediatrics	Reconstitute hyaluronidase solution to 15 units/mL: • Add 1 mL of 0.9% sodium chloride to the ampule of powder. • Draw up 0.1 mL (150 units) into a 10 mL syringe and further dilute with 0.9% sodium chloride to a final volume of 10 mL (15 units/mL). • Prepare five syringes of 0.2 mL each (each 0.2 mL contains 3 units of hyaluronidase; total dose 15 units). • Using a 25 or 27 gauge needle, infiltrate the five syringes of antidote subcutaneously into the leading edge of the extravasation.	
Phentolamine	Antidote	Adults	• Mix 10 mg Phentolamine in 10 mL NS (1 mg/mL) and inject subQ in multiple areas of surrounding tissue to the interstitial IV site using a 25-29 gauge needle, up to a total of 5 mL. • Change the needle between each skin entry. • Monitor the area by marking the border of discoloured tissue with indelible marker.	• Should be given within 6-8 hours of infiltration. Only partial reversal is achieved if administered within 12-18 hours.

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Drug	Type	Population	Instructions	Special Notes
		Neonates and pediatrics	Prepare a 0.5 mg/mL solution of Phentolamine: • Draw up 0.1 mL of 5 mg/mL Phentolamine and dilute with 0.9 mL of 0.9% sodium chloride for a final concentration of 0.5 mg/mL. • Prepare five syringes of 0.2 mL for a total dose of 0.5 mg. • Using a 25 or 27 gauge needle, administer five 0.2 mL injections into the leading edge of the extravasation site.	
Hydrocortisone 1% Cream	Topical Agent	Adults and pediatrics	• Apply to irritants only. • Apply thinly over the site and cover with a sterile dressing. Reapply as often as every two hours if the area remains painful.	
Hydrocortisone 0.5% Cream	Topical Agent	Neonates	• Apply to irritants only. • Apply thinly over the site and cover with a sterile dressing. Reapply as often as every two hours if the area remains painful.	
Silver Sulfadiazine 1% Cream	Topical Agent		• Used for agents that may be caustic (burn-like) if necrosis is visibly present. • May be used in cases where open wounds are present. • Contraindicated with Sulfonamide allergy and for infants less than 2 months old due to increased risk of kernicterus with sulfonamides. • Use carefully if applied to the face or head.	
Topical Nitroglycerin	Vasodilator	Adults	• Increases capillary blood flow and counteracts the local ischemia induced by the extravasated vasoconstrictive medications.	• Apply 0.2 mg patch daily to site of ischemia.