

## IREDELL HEALTH SYSTEM

<b>Adult Extravasation Management</b>	
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P&T Committee	Date: 12/2021

### **PURPOSE**

To provide adult patients with prompt and standardized management if infiltration or extravasation occurs.

### **POLICY**

#### **Definitions:**

- a) **Extravasation:** Inadvertent leakage or escape of a drug or solution from a vein or unintentional injection into surrounding tissues. Depending upon the substance that extravasates, injury can range from very mild skin reactions to necrosis or progressive tissue damage.
- b) **Infiltration:** Administration of non-vesicant/non-irritant solution into tissue surrounding vein.
- c) **Flare:** Local allergic reaction typified by red patches or streaking along vein. Painless and usually subsides within 30 minutes, with or without treatment.
- d) **Vesicant:** An agent capable of causing tissue destruction (blistering or tissue necrosis) when extravasated.
- e) **Irritant:** An agent capable of causing aches, tightness and phlebitis at the injection site and/or along the vein with or without an inflammatory reaction. Symptoms are usually of short duration without lasting sequelae, usually does not cause necrosis.
- f) **Delayed:** symptoms which occur >48 hours after infusion
- g) **Exfoliant:** an agent with potentially low vesicant properties that can result in inflammation and peeling of the skin. These agents can cause superficial tissue injury, blisters, and desquamation, yet do not lead to underlying tissues necrosis.
- h) **Neutrals:** Agents that neither cause inflammation nor damage upon extravasation.

### **PROCEDURE**

- A. Routinely assess the cannulation site and the surrounding tissue for any signs and symptoms of possible extravasation.
  1. Signs and symptoms may include changes in sensation, pain, local burning or tingling at infusion site, swelling, erythema, pruritus, or inflammation.
  2. Within 2-3 days increased erythema, pain, brawny discoloration, induration, dry desquamation, and/or blistering may occur.
  3. Signs and symptoms for central venous catheter (CVC) devices may include accumulation of the extravasated solution in the mediastinum, pleura, or in the subcutaneous tissues of the chest or neck. The primary symptom is thoracic pain.  
**\*\*If extravasation is suspected, treatment should begin as soon as possible. Early detection and treatment can significantly reduce tissue damage. \*\***
- B. Management of Peripheral IV Extravasation
  1. Stop infusion immediately if extravasation suspected; leave the IV and cannula tubing in place and immobilize the extremity.

2. Gently aspirate any residual drug and/or blood from the IV tubing, cannula, and suspected extravasation site. *Note: If unable to aspirate residual drug from intravenous cannula, remove the cannula.*
  3. Elevate site.
  4. Notify provider.
  5. Apply cold or warm compress per guideline (Refer to Appendix A).
    - a. Cold compress: Apply cold compress for 20 minutes, 3 or 4 times per day for up to 3 days to reduce swelling and localize the agent.
    - b. Warm compress: Apply warm compress for 20 minutes, 3 or 4 times per day for up to 3 days to vasodilate and disperse the agent. Warm compress should be used with caution.
  6. Administer antidote if ordered by provider (Refer to Exhibit A).
  7. Disconnect the IV tubing and syringe from the cannula.
  8. Mark area of extravasation and monitor site at 24 hours and weekly, as necessary.
  9. Document extravasation and management in the patient's electronic health record.
- C. Management of CVC IV extravasation
1. Stop infusion if extravasation suspected, if patient complains of changes in CVC site or flow rate discontinue infusion.
  2. Aspirate any remaining drug from the device and infiltrated site.
  3. Notify provider.
  4. Apply cold or warm compress to site per guideline (Refer to Appendix A).
    - a. Cold compress: Apply cold compress for 20 minutes, 3 or 4 times per day for up to 3 days to reduce swelling and localize the agent.
    - b. Warm compress: Apply warm compress for 20 minutes, 3 or 4 times per day for up to 3 days to vasodilate and disperse the agent. Warm compress should be used with caution.
  5. Administer antidote if ordered by provider (Refer to Appendix A).
  6. Mark area of extravasation and monitor site at 24 hours and weekly, as necessary.
  7. Document extravasation and management in the patient's electronic health record.

**References:**

- June TK, et al. Guidelines for the Management of Extravasation. *J Educ Eval Health Prof.* 2020;17:21.
- Firas YK, et al. Overview, Prevention and Management of Chemotherapy Extravasation. *World J Clin Oncol.* 2016;7(1):87-97.
- Vesicant and Irritant Chemotherapy. Revised 6/2021. HemOnc.org LLC. [https://hemonc.org/wiki/Vesicant\\_%26\\_irritant\\_chemotherapy](https://hemonc.org/wiki/Vesicant_%26_irritant_chemotherapy)

INITIAL EFFECTIVE DATE: 12/20218  
 DATES REVISIONS EFFECTIVE: 12/2021  
 DATES REVIEWED (no changes):

## Appendix A – Management of Extravasation

Medication	Vesicant/Irritant	Local Care	Antidote	Comments
<b>Chemotherapeutic Agents*</b>				
<u>Aclambicin</u> (Aclacinomycin)	<u>Irritant</u>	<u>Cold Compress</u>	<u>Dexrazoxane</u>	
<u>Amascrine (Amsidine)</u>	<u>Vesicant</u>	<u>Cold Compress</u>	<u>None</u>	
<u>Arsenic trioxide</u> (Trisenox)	<u>Irritant</u>	<u>Cold Compress</u>	<u>None</u>	
Bendamustine (Treanda <sup>®</sup> )	Irritant with vesicant-like properties	Cold compress	Sodium thiosulfate 1/6 M (4%)	
Bleomycin (Blenoxane <sup>®</sup> )	Irritant	Cold compress	None	
Bortezomib (Velcade <sup>®</sup> )	Irritant	None	None	
Busulfan (Busulfex <sup>®</sup> , Myleran <sup>®</sup> )	Irritant	Cold compress	None	
Carboplatin (Parplatin <sup>®</sup> )	Irritant	Cold compress	None	
Carmustine (BiCNU)	Vesicant/Irritant	Cold compress	Hyaluronidase (200 units/mL)	
Cisplatin (Platinol <sup>®</sup> )	Vesicant at concentration > 0.4 mg/mL	Cold compress	Sodium thiosulfate 1/6 M (4%)	<ul style="list-style-type: none"> <li>• Cisplatin extravasation treatment is ONLY for large volumes (&gt; 20 mL) of a concentration solution (&gt; 0.4 mg/mL).</li> <li>• Inject 2 mL intravenously into existing IV line for each 100 mg of cisplatin extravasated; consider also injecting 1 mL subcutaneously as 0.1-mL injections clockwise into the area around the extravasation, may repeat subcutaneous injections several times over the next 3-4 hours.</li> </ul>

<u>Cladribine (Leustatin)</u>	<u>Irritant/Neutral</u>	<u>Cold compress</u>	<u>None</u>	
Cyclophosphamide (Cytoxan <sup>®</sup> )	Irritant	Cold compress	Sodium thiosulfate 1/6 M (4%)	<ul style="list-style-type: none"> <li>Administer 5 mL subcutaneously into the extravasation site.</li> </ul>
<u>Cytarabine (Ara-C)</u>	<u>Irritant/Neutral</u>	<u>Cold compress</u>	<u>None</u>	
<u>Cytarabine liposomal (DepoCyt)</u>	<u>Irritant</u>	<u>Cold compress</u>	<u>None</u>	
Dacarbazine (DTIC-Dome <sup>®</sup> )	Irritant with vesicant-like properties	Cold compress	<u>Sodium thiosulfate 1/6 M (4%) – only recommended when concentrated dacarbazine is extravasated</u>	<ul style="list-style-type: none"> <li>Protect site from sunlight</li> </ul>
Dactinomycin (Cosmegen <sup>®</sup> )	Vesicant	Cold compress	None	<ul style="list-style-type: none"> <li>Do not apply heat, it may worsen injury</li> <li>Protect site from heat/sunlight</li> </ul>
Daunorubicin (Cerubidine <sup>®</sup> )	Vesicant	Cold compress	<u>Dexrazoxane or topical DMSO. Do not use in combination with each other due to decreased efficacy of dexrazoxane.</u>	<ul style="list-style-type: none"> <li>Do not apply heat, it may worsen injury</li> <li>Protect site from heat and sunlight</li> <li>Corticosteroids worsen toxicity</li> </ul>
Docetaxel (Taxotere <sup>®</sup> )	Irritant with vesicant-like Properties	Warm or cold compress	<u>Hyaluronidase</u>	<ul style="list-style-type: none"> <li><u>Excess cold can cause further tissue damage</u></li> </ul>
Doxorubicin (Adriamycin <sup>®</sup> )	Vesicant	Cold compress	<u>Dexrazoxane or topical DMSO. Do not use in combination with each other due to decreased efficacy of dexrazoxane.</u>	<ul style="list-style-type: none"> <li>Do not apply heat, it may worsen injury</li> <li>Protect site from heat and sunlight</li> <li>Corticosteroids worsen toxicity</li> </ul>
Epirubicin (Ellence <sup>®</sup> )	Vesicant	Cold compress	<u>Dexrazoxane or topical DMSO. Do not use in combination with each other due to decreased efficacy of dexrazoxane.</u>	<ul style="list-style-type: none"> <li>Do not apply heat, it may worsen injury</li> <li>Protect site from heat and sunlight</li> <li>Corticosteroids worsen toxicity</li> </ul>
Etoposide (VePesid <sup>®</sup> , Toposar <sup>®</sup> )	Irritant	Warm compress	<u>Hyaluronidase</u>	
Etoposide phosphate (Etopophos <sup>®</sup> )	Irritant	Warm compress	<u>Hyaluronidase</u>	
Floxuridine (FUDR)	<u>Irritant</u>	<u>Cold compress</u>	<u>None</u>	
Fludarabine (Fludara <sup>®</sup> )	Not applicable	Warm compress	None	

Fluorouracil (Adrucil <sup>®</sup> )	Irritant	Cold compress	None	
Gemcitabine (Gemzar <sup>®</sup> )	Irritant	Cold compress	None	
Gemtuzumab (Mylotarg <sup>®</sup> )	Irritant	Cold compress	None	
Idarubicin (Idamycin <sup>®</sup> )	Vesicant	Cold compress	Dexrazoxane	<ul style="list-style-type: none"> <li>Do not apply heat, it may worsen injury</li> <li>Protect from heat/sunlight</li> <li>Corticosteroids worsen toxicity</li> </ul>
Ifosfamide (Ifex <sup>®</sup> )	Irritant	Cold compress	None	
Irinotecan (Camptosar <sup>®</sup> )	Irritant	Ice pack and flush external site with sterile water	None	
Ixabepilone (Ixempra Kit <sup>®</sup> )	Irritant	<u>Cold compress</u>	None	
Mechlorethamine (Mustargen <sup>®</sup> )	Vesicant	Cold compress	Sodium thiosulfate 1/6 M (4%)	<ul style="list-style-type: none"> <li>Administer 2 mL subcutaneously into the extravasation site for each mg of drug suspected to have extravasated.</li> </ul>
Melphalan (Alkeran <sup>®</sup> )	Irritant/Vesicant	Cold compress	None	
Methotrexate	N/A	Warm compress	None	
Mitomycin (Mutamycin <sup>®</sup> )	Vesicant	Cold compress	<u>DMSO 50% or Sodium thiosulfate 1/6 M (4%)</u>	<ul style="list-style-type: none"> <li>Do not apply heat, it may worsen injury</li> <li>Protect extravasation site from heat and sunlight</li> <li>Delayed injuries from mitomycin have been documented at sites distant from the site of extravasation</li> </ul>
Mitoxantrone (Novantrone <sup>®</sup> )	Irritant with vesicant-like properties	Cold compress	<u>Dexrazoxane or topical DMSO. Do not use in combination with each other due to decreased efficacy of dexrazoxane.</u>	
Oxaliplatin (Eloxatin <sup>®</sup> )	Irritant with vesicant-like properties	Warm compress	<u>Oral dexamethasone 8 mg twice daily for up to 14 days or Sodium thiosulfate 1/6 M (4%)</u>	<ul style="list-style-type: none"> <li>Do <b>not</b> apply cold, may precipitate acute neurotoxicity</li> <li>Early administration of corticosteroids may be beneficial to</li> </ul>

				decrease inflammation
Paclitaxel (Taxol <sup>®</sup> )	Irritant with vesicant-like properties	Cold compress	Hyaluronidase (200 units/mL)	<ul style="list-style-type: none"> <li>Usual dose is 0.75 mL (150 units) of hyaluronidase for each 1 mL of extravasated drug. May repeat several times over the next 3-4 hours.</li> </ul>
<u>Plicamycin (Mithracin)</u>	<u>Vesicant/Irritant</u>	<u>Cold compress</u>		
<u>Raltitrexed (Tomudex)</u>	<u>Irritant</u>	<u>Cold compress</u>		
Streptozocin (Zanosar <sup>®</sup> )	Irritant	Cold compress	None	
Teniposide (Vumon <sup>®</sup> )	Irritant	Warm <u>or</u> cold compress	Hyaluronidase (200 units/mL)	
Thiotepa (Thiopex <sup>®</sup> )	N/A	Warm <u>or</u> cold compress	None	
Topotecan (Hycamtin <sup>®</sup> )	Irritant	<u>Cold compress</u>	None	
Trabectedin (Yondelis <sup>®</sup> )	Vesicant	Cold compress	None	
Trastuzumab emtastine (Kadcyla <sup>®</sup> )	Irritant	None	None	
Vinblastine (Velban <sup>®</sup> )	Vesicant	Warm compress	Hyaluronidase (200 units/mL)	<ul style="list-style-type: none"> <li>Corticosteroids and topical cooling can worsen toxicity.</li> </ul>
Vincristine (Oncovin <sup>®</sup> )	Vesicant			
Vindesine	Vesicant			
Vinorelbine (Navelbine <sup>®</sup> )	Vesicant			<ul style="list-style-type: none"> <li>Usual dose is 0.75 mL (150 units) of hyaluronidase for each 1 mL of extravasated drug.</li> </ul>
<b>Non-Chemotherapeutic Agents</b>				
<u>Acyclovir</u>	<u>Irritant</u>		<u>None</u>	
<u>Amiodarone</u>	<u>Vesicant</u>	<u>Warm compress</u>	<u>Hyaluronidase</u>	
Aminophylline	Vesicant	Cold compress	Hyaluronidase (200 units/mL)	
Arginine (R-Gene 10 <sup>®</sup> )	Vesicant	Warm or cold compress	Hyaluronidase (200 units/mL)	
Calcium Salts	Vesicant	Cold compress	Hyaluronidase (200 units/mL)	
Contrast Media	Irritant	Warm or cold Compress	Hyaluronidase (200 units/mL)	<ul style="list-style-type: none"> <li>&lt; 50 ml, low-osmolarity contrast media extravasation: Careful monitoring recommended; pharmacologic treatment often unnecessary</li> </ul>

				<ul style="list-style-type: none"> <li>&gt; 50 ml low-osmolarity contrast media, any high-osmolarity contrast media, precursors of severe tissue injury: Consider use of hyaluronidase; dose may vary depending on the size of the infiltration</li> </ul>
Diazepam (Diastat <sup>®</sup> , Valium <sup>®</sup> )	Vesicant	Cold compress	Hyaluronidase (200 units/mL)	
Dextrose > 10%	Vesicant	Cold compress	Hyaluronidase (200 units/mL)	
Digoxin (Digitek <sup>™</sup> , Digox <sup>®</sup> , Lanoxin <sup>®</sup> )	Vesicant	None	None	
Dobutamine	Vesicant	Warm compress	Phentolamine injection, nitroglycerin topical 2% ointment, or terbutaline	<ul style="list-style-type: none"> <li>Phentolamine preferred 1<sup>st</sup> line</li> </ul>
Dopamine	Vesicant	Warm compress	Phentolamine injection, nitroglycerin topical 2% ointment, or terbutaline	<ul style="list-style-type: none"> <li>Phentolamine preferred 1<sup>st</sup> line</li> </ul>
Epinephrine	Vesicant	Warm compress	Phentolamine injection, nitroglycerin topical 2% ointment, or terbutaline	<ul style="list-style-type: none"> <li>Phentolamine preferred 1<sup>st</sup> line</li> </ul>
Esmolol (Brevibloc <sup>™</sup> )	Vesicant	Cold compress	None	
Mannitol (>5%)	Vesicant	Warm or cold compress	Hyaluronidase (200 units/mL)	
Methylene blue	Vesicant	Warm compress	Nitroglycerin 2% topical ointment or phentolamine injection	
Nafcillin (Nallpen in Dextrose <sup>®</sup> )	Vesicant	Cold compress	Hyaluronidase (200 units/mL)	
Norepinephrine (Levophed <sup>®</sup> )	Vesicant	Warm compress	Phentolamine injection, nitroglycerin topical 2% ointment, or terbutaline	<ul style="list-style-type: none"> <li>Phentolamine preferred 1<sup>st</sup> line</li> </ul>
Parenteral Nutrition	Vesicant	<u>Cold compress</u>	Hyaluronidase (200 units/mL) or nitroglycerin topical 2%	
<u>Pentamidine</u>	<u>Irritant with vesicant-</u>	<u>Warm compress</u>	<u>None</u>	

	<u>like properties</u>			
Phenylephrine	Vesicant	Warm compress	Phentolamine injection, nitroglycerin topical 2% ointment, or terbutaline	<ul style="list-style-type: none"> <li>Phentolamine preferred 1<sup>st</sup> line</li> </ul>
Phenytoin (Dilantin <sup>®</sup> , Phenytek <sup>®</sup> )	Vesicant	Warm compress	Hyaluronidase (200 units/mL), nitroglycerin topical 2%	
Potassium Salts	Vesicant/Irritant	Warm or cold compress	Hyaluronidase (200 units/mL)	
Promethazine (Phenadoz <sup>®</sup> , Phenergan <sup>®</sup> , Promethegan <sup>®</sup> )	Vesicant	Warm or cold compress	None	<ul style="list-style-type: none"> <li>Refractory cases: Consider Nitroglycerin 2% topical or hyaluronidase (200 units/ml)</li> </ul>
Sodium bicarbonate (≥ 8.4%)	Vesicant	Cold compress	Hyaluronidase (200 units/mL)	
Sodium chloride (≥ 3% percent)	Vesicant	<u>Cold</u> compress	Hyaluronidase (200 units/mL)	
TPN	Vesicant	Cold compress	Hyaluronidase (200 units/mL)	
<u>Vancomycin</u>	<u>Irritant</u>	<u>Warm or cold compress</u>	<u>Hyaluronidase</u>	
Vasopressin	Vesicant	Warm Compress	Phentolamine injection, nitroglycerin topical 2% ointment, or terbutaline	<ul style="list-style-type: none"> <li>Nitroglycerin preferred 1<sup>st</sup> line</li> </ul>

\*Other chemotherapeutic agents including the following do not typically have vesicant or irritant properties and no local care is required:

Asparaginase (Elspar<sup>®</sup>)

Clofarabine (Clolar<sup>®</sup>)

Cytarabine (Cytosar<sup>®</sup>)

Nelarabine (Arranon<sup>®</sup>)

PEG-asparaginase (Oncaspar<sup>®</sup>)