Guideline for the Treatment and Care of Peripheral Intravenous Extravasations/Infiltrations in Neonates

Purpose:

To guide healthcare providers in the prevention, identification and management of infiltrations or extravasations of intravenous (IV) medications and fluids in the neonate.

Definitions:

Extravasation- inadvertent administration of vesicant medication or fluid into the surrounding tissues.
Infiltration- inadvertent administration of non-vesicant medication or fluid into the surrounding tissues.
Irritant- agents capable of causing pain, swelling, venous irritation and chemical phlebitis at the injection site (calcium gluconate, digoxin, erythromycin, gentamicin).
Vesicant- a solution that causes the formation of blisters if extravasated, leading to tissue necrosis and sloughing.

Background:

Administration of IV medications in neonates can result in infiltration of the drug or solution into the surrounding tissues, resulting in extravasation injury. If identified early, the majority of infiltrations remain localized and cause no significant injury. However, some extravasations can cause severe tissue necrosis, resulting in scarring and/or reduced function of the involved extremity. Severe extravasation injuries can prolong hospitalization and increase costs. Prevention of these iatrogenic injuries is essential, however if an extravasation occurs early recognition and proper treatment are important in minimizing morbidity.

Preventative Measures:

- Avoid using winged blood collection devices (butterflies) for infusion
- Avoid repeated use of a vein
- Avoid areas difficult to immobilize if possible (elbows, wrists, knees)
- Tape loosely to promote circulation
- Do not tape proximal to IV site to prevent “tourniquet” effect
- Do not tape over IV insertion site
- Limit peripheral intravenous dextrose to 12.5%
- Dilute medications appropriately before administration
- Avoid peripheral infusion of calcium gluconate if possible
- Perform **ACT** hourly: **A**ssess catheter site (for redness, swelling, blanching, tenderness, leakage of fluid at the insertion site, blister, tautness, infant crying/flinching when flushing catheter), **C**ompare both extremities (e.g., distal site, fingers, toes, etc.), and **T**ouching for coolness every hour

Initial Management

- Stop infusion immediately if signs of infiltration/extravasation
- Remove catheter
- Elevate affected extremity
- Apply a saline soaked gauze (it will draw the infusate out and prevent a scab from forming)
- **Do Not Apply** warm or cold compress

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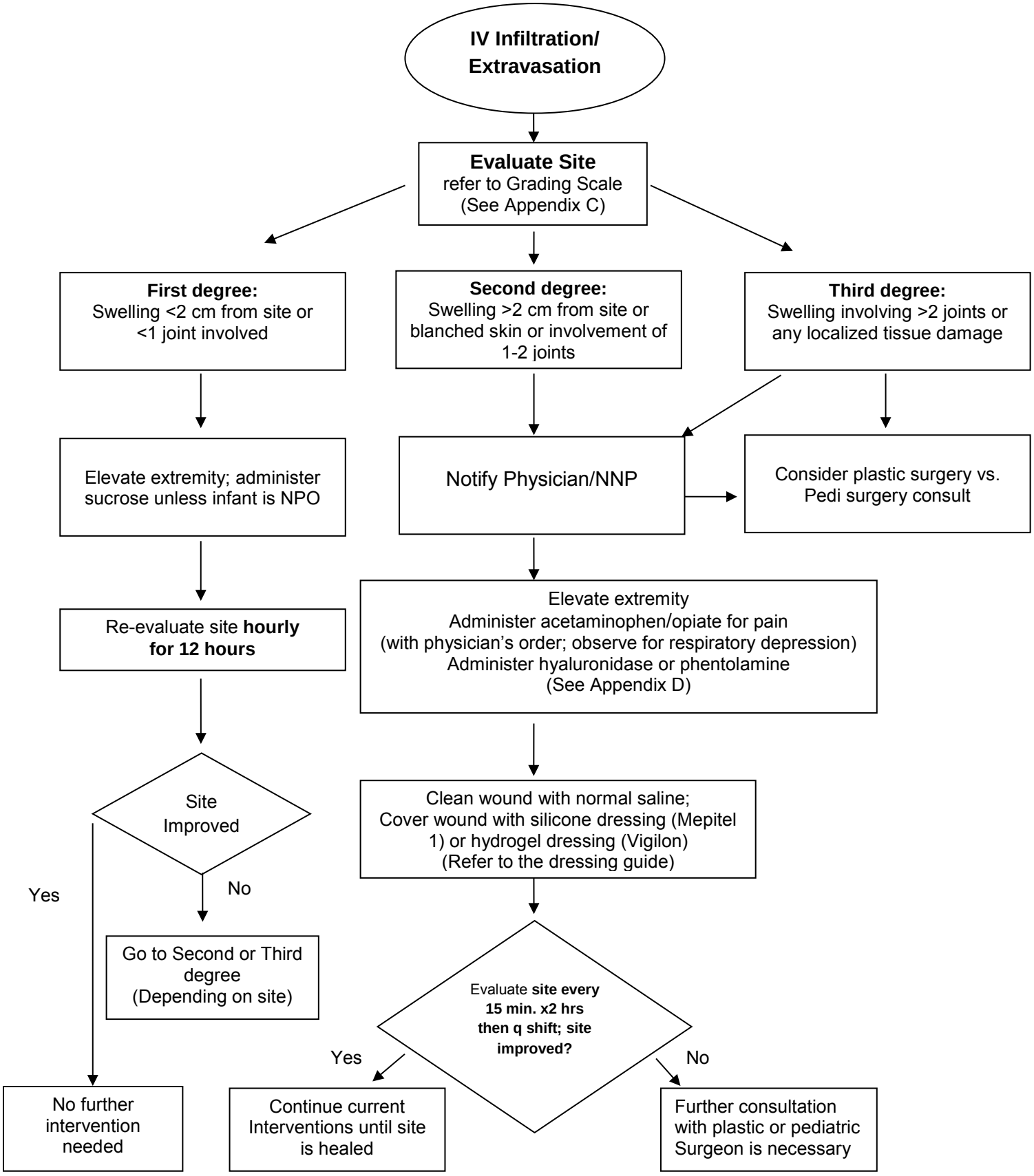
- Refer to Appendix A for the Algorithm for Evaluation and Treatment of IV Infiltrations/Extravasations
- Refer to Appendix B for the pharmacological agents used for the treatment of IV extravasations
- Refer to Appendix C for the grading scale of severity of IV infiltration/extravasation
- Refer to Appendix D for the procedure for administering hyaluronidase and phentolamine
- Refer to Appendix E for the ongoing treatment of 2nd and 3rd degree infiltrated/extravasated wound

Documentation of an Infiltration/Extravasation Injury

- Date/time of event
- Time MD/NNP was notified
- Initial management measures performed (e.g., stop infusion immediately, pull catheter, elevate affected extremity and apply saline soaked gauze)
- Appearance of the infusion site (e.g., color, perfusion, pulse, range of motion) hourly x 12 hours then every shift on the assessment flow sheet (enter skin, wound on the parameter)
- Grade extent of injury
- Use of antidotes (hyaluronidase or phentolamine)
- Description of wound care done
- If pediatric/plastic surgery consult or wound care nurse specialist was done if applicable
- Complete an Electronic Risk Assessment Form (eRAF) located on the UHS intranet

APPENDIX A

Algorithm for Evaluation and Treatment of IV Infiltrations/Extravasations



Refer to wound protocol for EMR documentation/Complete eRAF

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APPENDIX B

Pharmacological Agents for Treatment of IV Extravasations			
Pharmacologic Agent	**Medications and Solutions**		
hyaluronidase	• acyclovir • aminophylline • ampicillin • blood • calcium chloride • calcium gluconate • dextrose 10%	• digoxin • erythromycin • gentamicin • hypertonic saline • milrinone • nafcillin • oxacillin	• parenteral nutrition • penicillin • phenobarbital • phenytoin • potassium • radiocontrast media • sodium bicarbonate
Phentolamine (if available)	• dopamine • dobutamine	• epinephrine • norepinephrine	• phenylephrine

APPENDIX C

Grading Scale of Severity of IV Infiltration/Extravasation	
1st degree	Swelling less than 2 cm from site of less than 1 joint involved
2nd degree	Swelling greater than 2 cm from site or blanched skin or involvement of 1-2 joints
3rd degree	Swelling involving more than 2 joints or any localized tissue damage (e.g., blister or discolored skin)

Proposed scale of Dr. I. Amjad. Reprinted with permission.

APPENDIX D

Procedure for administering hyaluronidase

- Clean affected area with alcohol
- Inject hyaluronidase 200 units/mL by subcutaneous or intradermal route using a 25 gauge needle in 5 aliquots of 0.2 mL each around the periphery of the extravasated area; change the needle after each injection
- Give within 1-2 hours of the injury
- Observe and document the appearance of the site (induration, swelling, discoloration, blanching, and blister formation) every 15 minutes for 2 hours

Procedure for administering phentolamine (if available and not on shortage)

- Reconstitute 5 mg vial it with 1 mL normal saline; draw up 1 mL and add to 9 mL normal saline to make a 0.5 mg/mL final concentration
- Clean affected area with alcohol
- Inject phentolamine 0.5 mg/mL by subcutaneous or intradermal route using a 25 gauge needle in 5 aliquots of 0.2 mL each into the area of the extravasation; change the needle after each injection
- Give immediately but may be used up to 12 hours after the extravasation occurs
- Monitor infant for hypotension, dysrhythmia, and tachycardia every 15 minutes for 2 hours; observe and document the appearance of the site every 15 minutes for 2 hours

APPENDIX E

Ongoing Treatment of 2nd and 3rd Degree Infiltrated/Extravasated Wound:

Basic wound care must be rendered immediately pending Surgery/Pedi consult and Wound Care specialist consult (ext 82060/203-3161).

- Clean wound with normal saline
- Cover wound with silicone dressing such as Mepitel I or Hydrogel sheet
- May apply bacitracin ointment over Mepitel I as needed
- Cover Mepitel I with sterile gauze and secure with stockinette
- If blisters are present, may apply bacitracin ointment and cover with Mepitel I and sterile gauze
- The goal is to keep the wound moist and protect it from further injury and contamination

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