Georgetown University Hospital
MedStar Health

NICU PROCEDURE	Policy Number:
Title: IV Infiltration	
Issued:10/1996	Page: 2
Last Revised: 11/08, 7/09	Attachment:x 2

POLICY and PURPOSE: Tissue extravasations resulting from intravenous infiltration can occur as a complication of neonatal ICU care with varying degrees of morbidity. Serious extravasations can result in pain, infection, and disfigurement. Although most infiltrates resolve spontaneously after the IV catheter is removed, IV extravasations and tissue sloughing do occur in NICU patients. Specific therapies are based on assessment of the degree of the injury. The goal in managing tissue damage after IV extravasations is to improve tissue perfusion and prevent progression of tissue necrosis.

Infiltration= When a non-vesicant fluid leaks from a vein.
Extravasation=When the fluid/medication is toxic to the tissue (vesicant).

PROCEDURE

1) Stop the infusion, do not remove the IV. Remove arm board and constricting tape.
2) Attempt to aspirate the fluid from the catheter. (Aspiration of fluid from tissue may prevent further damage).
3) Remove the IV and elevate the extremity to encourage lymphatic drainage and absorption. Notify the MD/NNP as well as the charge RN. MD/NNP will help determine infiltrate staging and order treatment method.
4) Perform assessment and documentation of the infiltration area, including color, perfusion, pulse, range of motion, and estimated amount of infiltrated fluid based on time of discovery.
5) Hyaluronidase (Wydase) or Phentolamine (Regitine) should be administered ASAP for extravasations greater than or equal to a grade 3 by a RN with an order from a MD/NNP. Extravasation medications are effective if given within first few minutes to 1 hour after infiltrate is recognized.
6) **Do not administer IV, given by divided SQ injections.**
7) **Fill out an incident report to provide for follow-up and data analysis.**
8) MD/NNP may request plastic surgery evaluation if scarring or deeper involvement is likely.
9) To promote healing, use of aqueous gel and hydrocolloid dressings should be considered to provide a moist environment that promotes healing. The dressing protects the tissue from outside oxygen tension and provides a lower pH, which inhibits the growth of pathogens. This will be determined by the MD/NNP, plastic surgery evaluation, and/or wound care nurse.

Hyaluronidase (Wydase)
Aminophylline*
Amphotericin
Calcium salts*
Dextrose>10%
Gentamicin, Vancomycin
TPN/Lipids
Methicillin Naficillin
Phenytoin
Potassium Chloride*
Sodium Bicarbonate

Phentolamine (Regitine)
Dopamine*
Norepinephrine*
Dobutamine*
Epinephrine*

***Monitor vital signs every 15 minutes for 2 hours because absorption of the agent will be increased substantially and may lead to life threatening arrhythmia or other hemodynamic changes.**

Hyaluronidase (Wydase) (150units/ml)

a. **Indication:** Hyaluronidase is a protein enzyme, which acts as a diffusing agent by breaking down hyaluronic acid (a normal component of the interstitial fluid). This increases the local absorption of the infiltrated agent, thereby decreasing the amount of damage incurred. Hyaluronidase should not be used for the treatment of vasopressor agents.
b. **Reconstitution:** Follow directions on vial, to dilute to a concentration of 150units/ml.
c. **Procedure:** Draw up 0.2ml in 3-5 TB syringes with 25G needle. Clean area with betadine, allow drying. Inject 0.2ml intradermally or SQ, in 3- 5 divided doses (depending of the size of the infiltrate) around periphery of extravasations site. Gently remove betadine.
d. **Completion:** Place sterile 2x2 gauze over the infiltration site. Wrap loosely for at least 2 hours. (Do not apply heat), elevate extremity to reduce swelling.

Phentolamine (Regitine) (1mg/ml)

a. **Indication**: Phentolamine is an alpha-adrenergic blocking agent which competitively blocks the local effects of catecholamine, such as epinephrine, on alpha-adrenergic receptors. **It is most effective when given immediately but can be given up to 12 hours after the extravasations.**
b. See Neofax for **reconstitution** and dilution.

Procedure: Follow procedure "c and d" above.

For ischemia, consider topical 2% Nitroglycerin ointment. 4mm/kg may be applied directly to the site of severe skin ischemia in late pre-term infants> 21days of age with intact skin. MD/NNP order required.

Prevention of Peripheral IV Infiltration:

1) Use insertion devices covered with plastic/silicone catheters instead of steel needles.
2) **An extremity with an infusing IV may not be included in the swaddle wrap of an infant.**
3) Whenever possible, avoid placing IV tubes in areas of flexion or surrounding tendons, nerves, or arteries.
4) Secure IV devices with transparent adhesive dressing or clear tape so the insertion site, and the area around the catheter tip, is clearly visible.
5) Place tape securely (avoiding constriction) over bony prominences to prevent obstruction of venous return.
6) In peripheral IV and midline catheters, limit glucose concentration to 12.5 percent.
7) Assess the catheter insertion site and perfusion to the areas distal to the catheter insertion, with appropriate documentation, at least hourly.
8) If signs of infiltration are noted, stop the infusion immediately.

Documentation:

1) Document assessment of the infiltrate, including color, perfusion, pulse, range of motion, and estimated amount of infiltrated fluid based on time of discovery.
2) Who was notified (date & time)
3) Staging of the Infiltrate using the staging tool as a reference (done with NNP / MD)
4) Treatment of the Infiltrate: (Place medication on the CMAR as well)
5) Ongoing documentation should address post-infiltration assessment each shift.

References:

1. Lamagna, P., MacPhee, M. Troubleshooting Pediatric Peripheral IV's: Phlebitis and Infiltration. Nursing Spectrum. July 01, 2004.
2. MacDonald, MG. Ramasethu, J. Atlas of Procedures in Neonatology. 4th Ed. Philadelphia, Pa: Lippincott, Williams & Wilkins. 2007:153-155.
3. Thigpen, J.L. Peripheral Intravenous Extravasation: Nursing Procedure for Initial Treatment. Neonatal Network. Vol26, No. 6. November/December 2007. pp 379-384.

4. Young, T.E., Magnum, B. Neofax: A manual of Drugs used in Neonatal Care. 21st ed. Montavale, NJ. Thompson Reuters. 2008:163.

Pediatric Nursing Director Date

NICU Medical Director Date

Figure 1 — Reference Tool: Infiltrate

Assess IV per management of peripheral intravenous catheters policy, following the corresponding intervention guidelines. These guidelines are not intended to establish a protocol for all patients, nor are they intended to replace a clinician's clinical judgment.

	Clinical Symptoms	Actions	
Stage I	• Skin blanched • Edema <1 inch in any direction • Cool to touch • With or without pain	For All Stages — 1. Stop infusion/Establish alternate IV site 2. Determine infusate 3. Refer to online pharmacy to determine if infusate is a vesicant 4. Elevate extremity 5. Continue assessment of site and surrounding tissue, prn	• Vesicant — refer to Stage IV infiltrate actions • Nonvesicant — remove IV
Stage II	• Skin blanched • Edema >1 inch • Cool to touch • With or without pain		• Vesicant — refer to Stage IV infiltrate actions • Nonvesicant — remove IV • Notify primary service • If tissue damage progresses, refer to Stage III or IV
Stage III	• Skin blanched, translucent • Gross edema >6 inches in any direction • Cool to touch • Mild to moderate pain • Possible numbness		• Vesicant — refer to Stage IV infiltrate actions • Nonvesicant — remove IV • Call primary service for assessment and need for plastic surgery consult • If tissue damage progresses refer to Stage IV
Stage IV	• Skin blanched, translucent • Skin tight, leaking • Skin discolored, bruised, swollen • Gross edema >6 inches in any direction • Circulatory impairment • Moderate to severe pain • Possible numbness • Infiltration of any blood product, irritant, vesicant		• Vesicant — refer to unit/ pharmacy policies • Nonvesicant — remove IV • Notify primary service • Notify plastic surgery and/or orthopedics for assistance in determining further treatment

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Infiltrate Documentation Note

1. Designate site of infiltrate on picture above keep size proportional. Document Assessment of site: (Perform assessment and documentation of the infiltration area, including color, perfusion, pulse, range of motion, and estimated amount of infiltrated fluid based on time of discovery.)

2. Who was notified (date & time):

3. Staging of the Infiltrate (done with NNP or Doctor) (Use staging tool as reference):

4. Treatment of the Infiltrate: (Place medication on the CMAR as well):

_____ _____

Signature of nurse Date Physician/NNP: Date