Clinical Guidance

Paediatric Peripheral Extravasation Treatment Guideline

Summary

Guidelines for the initial treatment of an extravasation injury in children.

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Keywords	Extravasation, injury, paediatric, Evelina, infiltration, washout
Relevant external law, regulation, standards	This clinical guideline has been produced by the South Thames Retrieval Service (STRS) at Evelina London for nurses, doctors and ambulance staff to refer to in the emergency care of critically ill children. This guideline represents the views of STRS and was produced after careful consideration of available evidence in conjunction with clinical expertise and experience. The guidance does not override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient.

Change History		
Date	Change details, since approval	Approved by
January 19	Updated classification of extravasation injuries. Need to treat Grade 3 or above	ELCGC Chair

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Peripheral Extravasation Injury

Extravasation is the inadvertent leakage of IV fluids/medications from the intravascular to interstitial space, which has the potential to result in local tissue necrosis. It usually causes a chemical burn underneath the skin and therefore superficial skin changes appear when there is a full thickness injury.

Treatment should ideally be instituted **within 1 hour** of extravasation, and ideally no later than 12 hours. **The earlier treatment is started the better.**

In cases of delayed presentation with toxic fluid extravasation injuries, it is still worth washing these out within 24 hours.

Drugs causing severe extravasation injuries are: hyperosmolar (>290 mOsm), alkaline (pH>7.5) or acidic (pH<5). Common examples include Calcium Chloride, Sodium Bicarbonate, Potassium Chloride, Magnesium Sulphate, **ALL** inotropes (including Milrinone), Aciclovir, Diazepam, Digoxin, Thiopental, Phenytoin and Phenobarbital. *For further information contact pharmacy.*

Management of an Extravasation Injury

1. **Stop** the infusion/drug administration immediately and note the time of injury
2. **Assess the limb** (see table below): any **compromise to neurovascular status** or **suspected compartment syndrome** (e.g.in large volume extravasations or long lines) is a **surgical emergency**.
3. Do not remove the cannula.
4. Mark the edge of the area of skin change with a pen and photograph the area
5. Aspirate any residual drug through the cannula
6. **Elevate** the affected limb
7. Ensure the child has adequate analgesia
8. **Contact the Plastic Surgery on-call team immediately** (SHO blp 0155, SpR blp 0550).
9. **Inform the patient's Medical/Surgical team**
10. If the drug infusion which has been stopped due to the extravasation injury needs to continue, then a different limb needs to be used for cannulation.
11. Inform the parents
12. Document in the notes the nature of drug, type of IV line (i.e. central, long line, peripheral cannula), estimated volume of extravasated fluid, time infusion started, time of injury and time Plastic Surgery team contacted.
13. **Fill in an IR-1 form**
14. Use the **flush technique** (see below) if a washout is required (Grade 3 or above).

Assessment

Grade 1	Grade 2	Grade 3	Grade 4
Pain at infusion site	Pain at infusion site Swelling No skin blanching Normal capillary refill and peripheral pulsation	Pain at infusion site Swelling Skin blanching Cool blanched area Normal capillary refill and peripheral pulsation	Pain at infusion site Swelling Skin blanching Cool blanched area Reduced capillary refill +/- Arterial occlusion +/- Blistering

Ref: The Royal Children's Hospital Melbourne

Flush Technique

1. Clean the skin and prepare a sterile field.
2. Infiltrate 1% lidocaine around the extravasation area. Local anaesthetic injection must be calculated by body weight, or use alternative analgesia.
   [Optional: Dissolve 1,500 units of hyaluronidase in the 1% lidocaine to be injected and infiltrate the area immediately surrounding the extravasation with the hyaluronidase and lidocaine mixture. The hyaluronidase will make the local anaesthetic spread further within the tissues].
3. Using a blue (23G) or green (21G) needle draw up 0.9% sterile sodium chloride for injection. Use a syringe size proportional to the size of the patient i.e. 20 ml syringe for teenagers, 10 ml for neonates.
   (Use of an 11 blade scalpel is acceptable for adults, but for children and neonates, a scalpel can result in unacceptably large incisions, so the use of a hypodermic needle instead is preferable to puncture the skin, as this will cause less scarring)
4. Inject aliquots of the sterile sodium chloride for injection subcutaneously through the skin to dilute and flush out the extravasated fluid from the tissues. You may need to inject at 10-20 sites within the zone of the extravasation injury. Injected fluid will collect in the subcutaneous tissues and dilute the extravasated drug. After each 10ml injection, press on the area with a dry piece of sterile gauze to express the fluid out. Ensure that all of the sodium chloride is expressed out prior to injecting more.
5. Repeat the process of injection and expressing the fluid out with gauze. This helps to both wash the area out and dilute the drug remaining under the skin. Up to 100mls may be needed for a neonate and 500 mls for a mature teenager, depending on the extent of the injury. Stop when the extravasated area appears to have been flushed out and the skin improves in colour.
6. Apply a Mepitel dressing and gauze to the affected area.
7. Elevate the affected limb for 24 hours.
8. For plastic surgery follow up the following morning on the ward round.
9. Consider prophylactic antibiotics in immuno-compromised patients. Steroids are not indicated in these cases.

NB. It is essential to document in the medical and nursing notes the extent of the injury and any treatment administered

Medical photography may also be required, please see Medical Photography Policy

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References: The Royal Children's Hospital Melbourne