EXTRAVASATION INJURIES ● 1/3

BACKGROUND

- Approximately 4% of babies develop skin necrosis as a result of extravasation of an IV infusion
- A small proportion of these babies develop long-term cosmetic or functional compromise
- Extravasation may be due to:
  - cannula piercing the vessel wall or
  - from distal venous occlusion causing backpressure and increased vascular permeability
- Cochrane review shows that centrally placed catheters may cause extravasation as often as peripheral cannulae
- Extravasation can lead to both short and long-term complications
- Use this guideline to define the grading and management of subcutaneous extravasation injuries in babies, either from peripheral or central lines
- Limiting the IV pump cycle to 1 hr **may** minimise the extent of tissue damage from extravasation providing the entry site is observed concurrently
- Degree of tissue damage due to extravasation is dependent upon:
  - volume of infusate, its pH and osmolality
  - the properties of any drug(s) being infused

ASSESSMENT

Table 1: Grading of extravasation injuries

Grade 1	Grade 2	Grade 3	Grade 4
• IV device flushes with difficulty • Pain at infusion site • No swelling or redness	• Pain at infusion site • Mild swelling • Redness • No skin blanching • Normal distal capillary refill and pulsation	• Pain at infusion site • Marked swelling • Skin blanching • Cool blanched area • Normal distal capillary refill and pulsation	• Pain at infusion site • Very marked swelling • Skin blanching • Cool blanched area • Reduced capillary refill • +/- arterial occlusion • +/- blistering/skin breakdown/necrosis

Investigations

- No specific investigations required. However, if wound appears infected:
  - wound swab
  - FBC
  - CRP
  - blood culture
  - start appropriate antibiotics [see **Infection (late onset)** guideline]

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ACUTE MANAGEMENT

Table 2

Grade 1 and Grade 2	Grade 3	Grade 4
• Stop infusion immediately • Remove cannula and splints/tapes • Elevate limb	• Stop infusion immediately • Remove constricting tapes • Leave cannula *in situ* until review by doctor/ANNP • Withdraw as much of the drug/fluid as possible via the cannula • Elevate limb • Inform tissue viability nurse	• Stop infusion immediately • Remove constricting tapes • Leave cannula *in situ* until review by doctor/ANNP • Withdraw as much of the drug/fluid as possible via the cannula • Photograph lesion – provided no delay in further treatment • Discuss with consultant whether to irrigate affected area (see below) • Elevate limb • Inform tissue viability nurse/registrar/consultant +/- plastic surgery team

- Most extravasation injuries are of Grades 1 and 2 and do not require extensive intervention
- Grade 3 and 4 injuries have a greater potential for skin necrosis, compartment syndrome and need for future plastic surgery, depending on type of solution extravasated

Irrigation of affected area

- A Cochrane review concluded that there is insufficient evidence to assess the effects of irrigation, with or without hyaluronidase
- The procedure itself may cause scaring whilst not all extravasation injuries leave scars
- Irrigation should only be considered in the most serious injuries with large volume extravasation of caustic solutions (e.g. calcium)
- For details of procedure see below

Wound dressings

- When choosing wound dressing, consider need to prevent:
  - further trauma
  - epidermal water loss
  - contractures by allowing a full range of limb movements
- Dressings must be:
  - easy to apply to small body surface areas
  - sterile
  - suitable for use in humidified/incubator environments

Most commonly used dressings

- Hydrocolloid 9 (e.g. Duoderm®) or hydrogel (e.g. Intrasite gel, Intrasite conformable)
  - if in doubt, seek advice from tissue viability nurse

Documentation

- Document extent and management of the injury in medical record

FOLLOW-UP AND REVIEW

- Determined by grade of extravasation
  - neonatal medical staff review minor grades after 24 hr
  - neonatal/plastic surgery staff/tissue viability nurse review Grades 3 and 4 within 24 hr to assess degree of tissue damage and outcome of irrigation procedure if performed

Other considerations

- **Family-centred care** – inform parents of extravasation injury and management plan

Special considerations

- Infection prevention – observe standard infection prevention procedures
- Complete an incident report for Grade 3 and 4 extravasations

IRRIGATION OF EXTRAVASATION INJURIES

Procedure

- Withdraw as much of the drug and or fluid as possible via cannula or catheter
- Infiltrate the site with lidocaine 1% 0.3 mL/kg before to reduce pain
- Using a scalpel, make 4 small incisions around periphery of extravasated site
- Insert blunt Tuohy needle, or pink cannula with needle removed, into each incision in turn, and irrigate damaged tissue with hyaluronidase* followed by sodium chloride 0.9%. It should flow freely out of other incisions
- Massage out any excess fluid using gentle manipulation
- Cover with paraffin gauze for 24–48 hr

***Preparation of hyaluronidase**

- Reconstitute a 1500 unit vial of hyaluronidase with 3 mL of water for injection
- Use 1–2 mL shared between each incision then irrigate with sodium chloride 0.9%

When irrigating with sodium chloride 0.9%, use discretion depending on baby's weight

Documentation

- Person performing procedure must document in baby's medical record