EXTRAVASATION INJURIES ● 1/2

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 cannula
- 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 dissociation constant and pharmacological action 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]

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 • Consider irrigation of affected area • 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 • Irrigate affected area • Elevate limb • Inform tissue viability nurse/registrar/consultant +/- plastic surgery team

EXTRAVASATION INJURIES ● 2/2

- 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

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

FURTHER ASSESSMENT

- Following irrigation treatment, review all injuries within 24 hr of extravasation occurring
- Irrigation of major grades of extravasation has been used to prevent extensive skin loss and need for plastic surgery and skin grafting. However, evidence for the use of irrigation in preventing long-term injury is limited

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 Veress 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
- To date no RCT have examined the effect of saline irrigation with/without prior hyaluronidase infiltration for management of extravasation injury in neonates (see https://www.cochrane.org/CD008404/NEONATAL_saline-irrigation-management-skin-extravasation-injury-neonates)

***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