



## GUIDELINE

# Extravasation Injuries

<b>Scope (Staff):</b>	Nursing and Medical Staff
<b>Scope (Area):</b>	NICU KEMH, NICU PCH, NETS WA

### Child Safe Organisation Statement of Commitment

CAHS commits to being a child safe organisation by applying the National Principles for Child Safe Organisations. This is a commitment to a strong culture supported by robust policies and procedures to reduce the likelihood of harm to children and young people.

This document should be read in conjunction with this [disclaimer](#)

## Aim

To facilitate the early identification and management of extravasation injuries in neonates

## Risk

- Neonates undergoing intensive care are at risk of extravasation of an intravenous infusion due to their inability to report pain, their skin and vein fragility, and carer and staff difficulties inspecting insertion sites.
- Risk of long-term cosmetic or functional compromise as a result of the injury if not identified and managed early.

## Definitions

Extravasation is the infiltration of vesicant solutions such as TPN, bicarbonate, vasopressors, calcium, antibiotics, phenytoin, potassium chloride, >10% glucose containing solutions and blood into subcutaneous tissues. This can result in blistering and tissue necrosis and requires immediate attention to limit further injury.

## Key points

- Infants under 27 weeks gestation and infants receiving TPN, highly concentrated glucose (i.e. 15-20%), calcium, sodium bicarbonate or inotropes through peripheral IV cannulae are most at risk. Therefore glucose > 12%, calcium, sodium bicarbonate or inotropes should be administered through a central line.
- Clinical assessment of extravasation may reveal:
  - Swelling, blistering or skin damage.
  - Skin discolouration or erythema.
  - An abnormal or hardened area.

- Closely monitor perfusion of the area distal to extravasation injury as, if compromised, it may lead to gangrene of the area.
- Avoid siting the tip of the cannula in an area of thin skin such as that over a joint. Always try to avoid positioning the tip of a cannula over the lateral malleolus.
- Observe the IV site at least hourly and pay attention to pump pressures. The Neonatal Peripheral Intravenous Assessment Score (PIVAS) should be recorded on the MR820. Infuse solutions using a pressure sensitive pump and monitor the pressure closely. Set initial pressure limit at 50-100mmHg and monitor fluctuations closely.

## Management of Extravasation

- The consultant or SR should be informed immediately of any extravasation injury.
- Immediately stop all infusions running through the IV but leave the cannula in until reviewed. Early review and early treatment can lead to better cosmetic results.
- The need for treatment with hyaluronidase is the decision of the consultant or SR and should be documented accordingly in the Inpatient Progress Notes (MR420). Examination of findings and treatment plan should be documented on the Neonatal Wound Management and Tool MR492.
- Management will depend on the severity of extravasation ([see Flow Chart](#)).
- Clinical photographs should be taken of the wound before and after treatment. Complete MR692.01 Clinical Photographic Request and Consent.
- Early referral of severe extravasation to plastic surgery should be considered.
- Closely monitor perfusion of the area distal to extravasation injury.
- A CIMS form is to be completed for all extravasation injuries.

A “**wait and see**” approach & leaving the wound exposed is associated with high rates of scarring as extent of tissue damage may be greater than originally thought. This approach leaves the irritant solution in the subcutaneous tissue to continue tissue necrosis and results in scab formation.

There is also little evidence for applying occlusive dressings and this approach also leaves the irritant solution within the subcutaneous tissues but does prevent scab formation.

## Infiltration of Hyaluronidase without Normal Saline Irrigation

Refer to Neonatal Medication Protocols - [Hyaluronidase](#)

This procedure is less invasive and less painful as compared with “infiltration of hyaluronidase followed by normal saline”. Problem with this approach, however, is that it still leaves the irritant in the subcutaneous tissue.

- Stop the infusion but leave the cannula in-situ.
- Try and aspirate from the cannula.

- Administer 1 mL Hyaluronidase (concentration 15 units/mL) through the existing IV cannula and/or
- Inject a total of 5 lots of 0.2 mL aliquots of Hyaluronidase (concentration 300 units/mL) into the periphery of the extravasation injury.

## **Infiltration of Hyaluronidase Followed by Normal Saline Irrigation**

DO NOT use the method if perfusion of the area distal to the extravasation site is compromised as irrigation of saline could worsen the perfusion.

This method has the advantage of removing the irritant from the subcutaneous tissue. Analysis of the returned irrigated fluid has shown that it contains the extravasated fluid. Works best if used early, preferably within one hour but up to 24 hours has been reported.

- Under aseptic techniques, the discoloured area and surrounding skin are cleaned and infiltrated with local anaesthetic, as this is a painful procedure.
- Refer to [Hyaluronidase](#) (concentration 15units/ml) through the existing IV cannula.
- Inject around and through the extravasation injury a total of 5 aliquots of 0.2 mL of Hyaluronidase (concentration 1000 units/mL).
- 4 small punctures are made in the tissue plane with a 19-gauge needle around the edge of the extravasation.
- Irrigate with normal saline through these punctures using a 19g needle. The limb may become swollen, but the saline should be able to be massaged gently out through the holes by gentle manipulation. Suggested volumes for irrigation range from 50-500 mLs (although in smaller infants 20mL may be sufficient).
- After irrigating leave the puncture wounds open and apply an atraumatic wound dressing such as mepilex.

## **Extravasation of vasopressor agents**

- Vasopressors such as dopamine can cause severe local tissue ischaemia. In the event of extravasation of dopamine, epinephrine, norepinephrine, or other vasopressors, discuss treatment options with Consultant and Pharmacist. To counteract vasoconstriction, consider local application of 0.2% Glyceryl Trinitrate ointment. Monitor blood pressure closely for hypotension. Refer to [Glyceryl Trinitrate](#) monograph.
- Other option to counteract vasoconstriction is local injection of Phentolamine (a non-selective alpha-adrenoreceptor antagonist); however, it is not available at KEMH.
- Monitor local and distal tissue perfusion closely.

**Figure 1: Flow Chart for management of Extravasation Injury**

(Adapted from Desarno J, Sandate I, Green K, Chavez P. When in Doubt, Pull the Catheter Out: Implementation of an Evidence-Based Protocol in the Prevention and Management of Peripheral Intravenous Infiltration/Extravasation in Neonates. Neonatal Netw. 2018;37(6):372-377. doi:10.1891/0730-0832.37.6.372Ref 8)

**EXTRAVASATION INJURY**

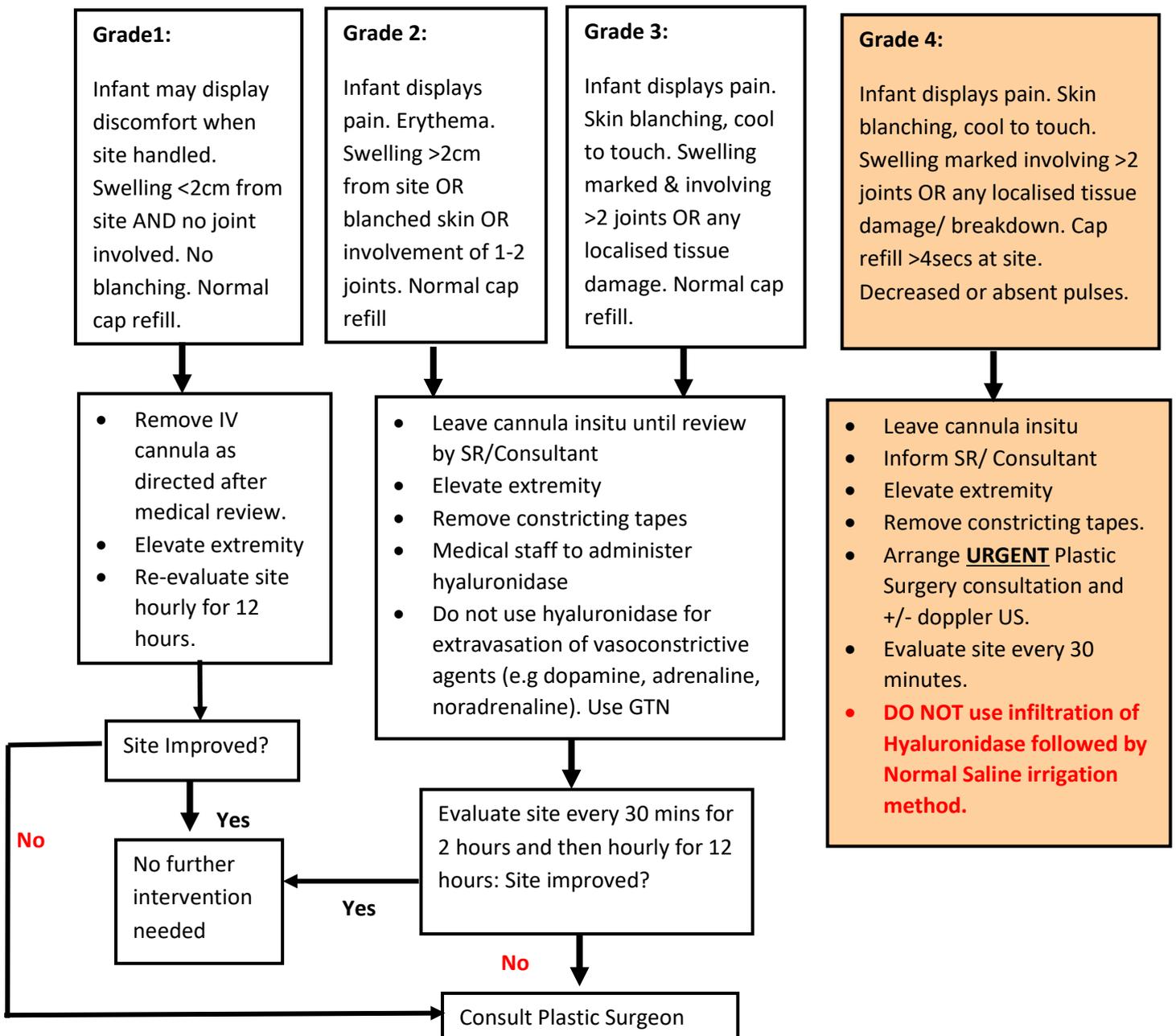
Leaking of a fluid or medication into extravascular tissue from an intravenous device.

**Warning signs:** Difficulty running infusion, or flushing PIVC. Pump pressures may be elevated.

**STOP** infusion and evaluate site and distal perfusion. **Leave cannula insitu.**

Inform Coordinator/ CNC and seek medical review.

Inform parents and complete a clinical incident notification.



## Related CAHS internal policies, procedures and guidelines

[Hyaluronidase](#)

[Glyceryl Trinitrate \(Topical\)](#)

## Useful resources (including related forms)

MR492 Neonatal Wound Management and Tool

MR692.01 Clinical Photographic Request and Consent

## References and related external legislation, policies, and guidelines

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3. Harris PA, Bradley S, Moss AL. Limiting the damage of iatrogenic extravasation injury in neonates. Plast Reconstr Surg 2001;107(3):893--4.
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9. Hackenberg RK, Kabir K, Heydweiller, et al. Extravasation injuries of the limbs in neonates and children: development of treatment algorithm. Dtsch Arztebl Int 2021; 118: 547–54. DOI: 10.3238/arztebl.m2021.0220
10. Plum M, Moukhachen O. Alternative pharmacological management of vasopressor extravasation in the absence of phentolamine. PT.2017;42(9):581-592.

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Document Owner:	Neonatology		
Reviewer / Team:	Neonatal Coordinating Group		
Date First Issued:	August 2006	Last Reviewed:	Sept 2023
Amendment Dates:		Next Review Date:	Sept 2026
Approved by:	Neonatal Coordinating Group	Date:	26 <sup>th</sup> Sept 2023
Endorsed by:	Neonatal Coordinating Group		
Standards Applicable:	NSQHS Standards: Child Safe Standards: 1,10		

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