

Extravasation injuries: Recognition and clinical management

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Definitions

► **INFILTRATION**

- Inadvertent leakage of a non-vesicant solution from its intended vascular pathway (vein) into the surrounding tissue.
- Generally does not lead to tissue necrosis, but large volume cause acute limb compartment syndrome (ALCS) and nerve compression.

- **EXTRAVASATION** is the inadvertent leakage of a vesicant solution from its intended vascular pathway (vein) into the surrounding tissue¹ can cause blisters, severe tissue injury or necrosis

- Vesicant solution*: A vesicant refers to any medicine or fluid with the potential to cause blisters, severe tissue injury (skin/tendons/muscle) or necrosis if it escapes from the intended venous pathway.

VESICANT DRUGS OR SOLUTION WITH HIGH EXTRAVASATION INJURY RISK

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<i>Hyperosmolar agents</i>	Concentrated electrolyte solutions	Vasoconstrictors	Other iv medications
TPN 10%dextrose	Any Calcium based solution Potassium chloride 7,45% Sodium bicarbonate 4,2 & 8,4% Sodium chloride 10%	Dopamine Adrenaline Noradrenaline Vasopressin Dobutamine	Vancomycin Cefotaxime Gentamicin Amphotericin Prostaglandin E Phenytoin, Phenobarbitone Amiodarone

RECOGNITION & ASSESSMENT:






Step 1

- ▶ INFILTRATION SUSPECTED: Swelling, induration, leakage, coolness or blanching at the site of cannula, tenderness /discomfort, resistance on plunger of syringes or absence of free flow of the infusion.
- ▶ EXTRAVASATION SUSPECTED:
 - 1)PERIPHERAL ACCESS: as for infiltration plus burning stinging pain, redness/erythema, blistering, tissue necrosis and ulceration
 - 2)CENTRAL VENOUS ACCESS: Sudden swelling or palpable subcutaneous tissue; no or loss of blood return; fluid leaking around needle

RECOGNITION & ASSESSMENT:

- ▶ Step 2: Determine the extent of injury & drug /fluid type administered.
- ▶ Step 3: Classify the severity according to “Extravasation & Phlebitis score”

EXTRAVASATION AND PHEBLITIS SCORE

EXTRAVASATION	Grade
<p>No symptoms</p> <p>→ A ←</p>	 <p>GRADE A</p>
<p>Skin blanched oedema < 2.5cm in any direction, cool to touch, with or without pain.</p> <p>→ B ←</p>	 <p>GRADE B</p>
<p>Skin blanched or red, blistered, oedema 2.5-15cm in any direction, cool to touch, with or without pain.</p> <p>→ C ←</p>	 <p>GRADE C</p>
<p>Skin blanched or red, blistered, gross oedema > 15cm in any direction, cool to touch, mild to moderate pain, possible numbness</p> <p>→ D ←</p>	 <p>GRADE D</p>
<p>Skin blanched, red, discoloured, bruised or broken down, gross pitting oedema, prolonged capillary refill time, moderate to severe pain.</p> <p>→ E ←</p> <p>Extravasation of any amount of blood product, irritant or vesicant.</p>	 <p>GRADE E</p>

IMMEDIATE INTERVENTION OF INFILTRATION INJURY

- ▶ INFILTRATION (0,9 % saline, dextrose saline or 5% dextrose and K up to 10 mmol /L) or EXTRAVASATION GRADE A/B:
 - Stop IMMEDIATELY infusion/injection
 - Aspirate as much as possible from cannula
 - Remove the cannula
 - Mark the edge of affected area with a skin marker
 - Prescribe pain relief and consider cooling the area
 - Keep the limb elevated for 24 hours and then review
 - Continue monitoring the site (colour, capillary refill, pulse & temp compared to other limb if appropriate (if progression to GRADE C/D/E, follow next algorithm)
 - If clinical concerns ONLY consider refer Plastic Surgeons and TVN for further treatment and follow up of necessary.

IMMEDIATE INTERVENTION OF EXTRAVASATION INJURY

- ▶ Extravasation grade C/D/E for peripheral device:
 - Stop IMMEDIATELY infusion/injection
 - Aspirate as much as possible from cannula
 - Remove the cannula
 - Mark the edge of affected area with a skin marker
 - Retain set or syringe to determine amount of drug extravasated
 - Prescribe pain relief
 - Perform Saline washout technique and/or inform Plastic Surgeon

STEP 1

- Ensure adequate analgesia. (Consider infiltration with 1% lignocaine subcutaneously around and beneath the zone of extravasation)



STEP 2

- Using 26G needle or a 11 blade scalpel, apply 4 to 6 vertical punctures (2 mm in length) to the affected area (*pin-cushion appearance*)



STEP 3

- Dissolve 1500 UI of hyaluronidase in 10 ml of 0,9% NaCl
- Infiltrate the area immediately surrounding the extravasation with hyaluronidase solution



STEP 4

- Using 24G needle horizontal to skin, infuse aliquots of 20 ml of 0,9% NaCl into subcutaneous tissues from different angles around the site (360°)
(volume of saline used to flush area should be adjusted depending on extent and severity of extravasation injury, up to 500 ml may be needed)



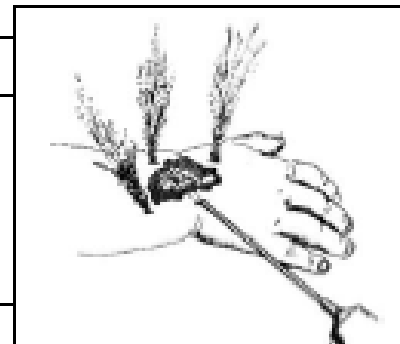
STEP 5

- Infused saline should be appearing readily out the *pin-cushion* holes
Injected fluid should not collect in the subcutaneous tissues. If this occurs the incisions are not adequate for drainage



STEP 6

Apply the dressings in layers:
1st) Mepitel, 2nd) Gauze and
3rd) Crepe bandage loosely applied





Thank you