ECN Protocol Book

Guidelines on the management of extravasation

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  Cancer pharmacy staff within ECN
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Definition of extravasation

Extravasation is the accidental, inappropriate or inadvertent administration of medication into the subcutaneous or sub-dermal tissues surrounding the administration site. Extravasation is possible with any intravenous injection, and the degree of tissue damage depends on the type of drug, its concentration and the amount extravasated. Vesicant drugs can cause tissue necrosis.

Extravasation is a medical emergency. Prevention, early recognition and prompt management are vital to prevent necrosis and functional loss of tissue or limb involved.

Risk Factors

Certain factors may put patients at a higher risk of extravasation and extra caution should be exercised when treating these patients:

- Elderly, debilitated patients especially if they have generalised vascular disease
- Patients with radical mastectomy and axillary exploration, surgery or lymph node dissection will have a decreased lymphatic drainage in that arm, leading to sluggish blood flow and increased venous pressure.
- Diabetes mellitus patients with peripheral neuropathy may not experience the pain of an infusate leaking into the subcutaneous tissues.
- Patients on concurrent medications eg analgesia, anticoagulants, antiplatelets, diuretics, steroids
- Repeated injections/infusion leading to thrombosed veins
- Veins of patients receiving chemotherapy are often fragile, mobile and difficult to cannulate

Prevention of Extravasation

The most important approach to minimising the risk of extravasation is prevention. All areas delivering parenteral SACT must have an extravasation kit or appropriate stock on the ward. It is the nurses’ responsibility to locate this and check the expiry date prior to administration.

- All staff administering intravenous chemotherapy must have completed appropriate training and maintain competency according to Trust policy. Staff must be able to recognise and manage an extravasation incident
- Careful assessment of the most appropriate peripheral cannulation site should be undertaken before insertion. The risk increases when veins over vital nerves and tendons are used as cannulation sites.
- All staff administering intravenous systemic anti-cancer therapy must have completed as a minimum the academic systemic anti-cancer therapy module and maintain yearly competency according to Trust policy.
- All staff administering intravenous systemic anti-cancer therapy must be able to recognise and manage an extravasation incident.
- Local warming with heat pad/or warm water may help dilate the veins.
- Vesicant drugs in a treatment regimen must be given before any other systemic anti-cancer therapy agents.
- When given peripherally, bolus doses of vesicants should be as a slow IV push via the side of a fast running infusion of a compatible fluid, with the exception of vinca alkaloids. Continual assessment of the cannulation site must be carried out throughout the administration, to assess for any signs and symptoms of extravasation as outlined in Section 3. The cannula should be secured with the use of a transparent dressing for ease of inspection.
- An individual risk assessment should be made at local Trust level, in the event of any vesicants being given by infusion.
- Extravasation can occur whilst using a central venous device (CVAD), causing subcutaneous infiltration of vesicant drugs into the chest wall, neck, or intrathoracic cavity. Always check for blood return and patency of the line first.
• Cannulas should always be flushed with an appropriate compatible solution prior to removal to ensure no residual drug remains at the cannulation insertion site.
• Use of local anaesthetics e.g. Emla/Ametop creams should be used with caution as they could reduce some of the signs of extravasation i.e. pain.
• If an extravasation is suspected it should be documented in the patients’ notes.

**If in doubt, recannulate**

**Symptoms of extravasation**

Patients should be informed prior to commencing parenteral SACT of potential problems of administering systemic anti-cancer therapy and the possible consequences, which should assist in early recognition and co-operation as patients are the first to notice pain.

An extravasation should be suspected if one or more of the following symptoms have occurred:

- The patient complains of burning, stinging or any discomfort/pain at the injection site. This should be distinguished from a feeling of cold that may occur with the administration of some drugs, or venous spasm which can be caused by irritation usually accompanied by a pain described as an ache or tightness.
- Observation of swelling, redness, leakage or blistering at the injection site. This should be distinguished from the ‘nettle rash’ effect seen with some anthracyclines.
- Blanching of the skin occurs. Erythema can occur around the cannula site but this is not usually present immediately.
- Blood return is absent or sluggish which may indicate lack of patency and/or incorrect position of the cannula. This is not a sign of extravasation if found in isolation, however this should be regarded as a non-patent vein, and the patient should be re-cannulated.
- Resistance is felt on the plunger of the syringe if bolus drugs are being given.
- There is an absence of free flow of infusion, and other reasons have been excluded e.g. position.
- It is important to note the volume of fluid extravasated.

**If extravasation is suspected treat as medical emergency: take immediate action**

**Overview of antidotes**

There is little evidence to support the use of steroids in vesicant extravasation as inflammation is not a prominent feature of tissue necrosis; however they may be useful to control inflammatory reaction when applied topically.

Reports on the clinical use of topical Dimethylsulfoxide (DMSO) show it may be effective, and is well tolerated in extravasation, however this should be further studied. However, it is recommended for use by both EONS and UKONS as an antidote to extravasation.

Hyaluronidase is an enzyme which destroys tissue cement and helps to reduce or prevent tissue damage by allowing rapid diffusion of the extravasated fluid and promoting drug absorption. The usual dose is 1500 IU, and should be administered within 1 hour of extravasation. It should be administered using the pincushion technique which involves instilling small amount (0.2–0.4mls) of drug around the area of extravasation.

Dexrazoxane (Savene®): This has been approved for use in ECN in July 2011. The approval is subject to following strict eligibility criteria. This includes the formal approval of a senior nurse and senior doctor before use and only for use within its licensed indication for an anthracycline extravasation.
Classification of Chemotherapy Agents

Table 1: Table of anti-cancer drugs according to their potential to cause necrosis when extravasated

<table>
<thead>
<tr>
<th>Neutrals (Group 1)</th>
<th>Inflammatory agents (Group 2)</th>
<th>Irritants (Group 3)</th>
<th>Exfoliants (Group 4)</th>
<th>Vesicants (Group 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ostensibly inert or neutral compounds that do not cause inflammation or damage</td>
<td>Causes mild to moderate inflammation and flare in local tissues</td>
<td>Causes inflammation and irritation, rarely proceeding to breakdown the tissue</td>
<td>Causes inflammation and shedding of skin, but less likely to cause tissue death</td>
<td>Causes pain, inflammation &amp; blistering of local skin, underlying flesh &amp; structures, leads to tissue death &amp; necrosis</td>
</tr>
</tbody>
</table>

Asparaginase  
Bevacizumab  
Bleomycin  
Cetuximab  
Cladribine  
Cyclophosphamide  
Cytarabine  
Fludarabine  
Gemcitabine  
Ifosfamide  
Interleukin 2  
Melphanal  
Pentostatin  
Rituximab  
Thiotepa  
Trastuzemab  
Interferons

Arsenic  
Fluorouracil  
Methotrexate  
Raltitrexed

Carboplatin  
Etoposide  
Irinotecan  
Teniposide

Aclarubicin  
Cisplatin  
Docetaxel  
Liposomal  
Daunorubicin  
Liposomal  
Daorubicin  
 Floxuridine  
 Mitoxantrone  
 Oxaliplatin  
 Topotecan

Amsacrine  
Carmustine  
Dacarbazine  
Daclitaxel  
Dactinomycin  
Daunorubicin  
Doxorubicin  
Epirubicin  
Idarubicin  
Mitomycin  
Mustine  
(Chlormethine)  
Paclitaxel  
Streptozocin  
Trabectedin  
Tresulfan  
Vinblastine  
Vincristine  
Vindesine  
Vinorelbine

For further information on drug classification please refer to [www.extravasation.org.uk](http://www.extravasation.org.uk)

Treatment Flowchart

- **Stop infusion immediately**  
  - Get extravasation kit (if applicable)
  - **Peripheral Line**
    - Disconnect the drip. **DO NOT REMOVE THE CANNULA**
    - Mark the extravasated area with an indelible pen
    - Aspirate the extravasated drug, trying to draw some blood back from the cannula
    - Remove the cannula. Elevate the limb.
    - Administer analgesics if required.
    - Liaise with consultant and consider referral to plastic surgeon
  - Follow the individual drug management instructions. Liaise with medical team

- **Central Line**
  - Disconnect the drip. Aspirate the drug from the line. **DO NOT REMOVE THE CENTRAL LINE**
  - Refer to plastic surgeon and inform patients consultant

- Observe the patient
  - Replace the extravasation kit/stock used
  - Ensure patient has regular medical review
  - Provide patient with information leaflet

1. Complete the green card which is found in the extravasation kit/stock on ward or from [www.extravasation.org.uk](http://www.extravasation.org.uk)
2. Document in patients notes and records
3. Complete the trust incident reporting form
## Individual Drug Management Instructions

**Trial Agents:** Refer to relevant trial protocol to determine management of suspected extravasation. Notify clinician responsible for the trial. Incident should be documented in the clinical trial records.

<table>
<thead>
<tr>
<th>Drug</th>
<th>Spread and Dilute</th>
<th>Localise and Neutralise</th>
<th>Specific Management</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aclarubicin</td>
<td></td>
<td>✓</td>
<td>Apply topical DMSO alternating with hydrocortisone cream and a cold compress.</td>
<td>Refer to further treatment of cytotoxic extravasation below.</td>
</tr>
<tr>
<td>Aldesleukin (IL-2)</td>
<td>✓</td>
<td></td>
<td>Infiltrate the site with hyaluronidase. Apply heat and compression.</td>
<td></td>
</tr>
<tr>
<td>Amsacrine</td>
<td></td>
<td>✓</td>
<td>Apply topical DMSO alternating with hydrocortisone cream and a cold compress.</td>
<td>Refer to further treatment of cytotoxic extravasation below.</td>
</tr>
<tr>
<td>Asparaginase</td>
<td>✓</td>
<td></td>
<td>Infiltrate the site with hyaluronidase. Apply heat and compression.</td>
<td>Re-test for asparaginase hypersensitivity before giving further doses</td>
</tr>
<tr>
<td>Arsenic</td>
<td></td>
<td>✓</td>
<td>Infiltrate the site with hyaluronidase.</td>
<td></td>
</tr>
<tr>
<td>Bendamustine</td>
<td></td>
<td>✓</td>
<td>Apply cold compress and replace at regular intervals.</td>
<td></td>
</tr>
<tr>
<td>Bleomycin</td>
<td></td>
<td>✓</td>
<td>Infiltrate the site with hyaluronidase. Apply heat and compression.</td>
<td>Possibility of local inflammation or necrosis and/or pain. There are no specific antidotes.</td>
</tr>
<tr>
<td>Carboplatin</td>
<td>✓</td>
<td>✓</td>
<td>Infiltrate the site with hyaluronidase. Followed by topical hydrocortisone and warm compression.</td>
<td></td>
</tr>
<tr>
<td>Carmustine</td>
<td></td>
<td>✓</td>
<td>Infiltrate with 2.1% sodium bicarbonate, leave for 2 minutes and aspirate off again</td>
<td>Note Sodium bicarbonate is a vesicant.</td>
</tr>
<tr>
<td>Cisplatin</td>
<td>✓</td>
<td>✓</td>
<td>Infiltrate the site with hyaluronidase. Followed by topical hydrocortisone and warm compression.</td>
<td></td>
</tr>
<tr>
<td>Cladribine</td>
<td></td>
<td>✓</td>
<td>Infiltrate the site with hyaluronidase. Apply heat and compression.</td>
<td></td>
</tr>
<tr>
<td>Cyclophosphamide</td>
<td></td>
<td>✓</td>
<td>Infiltrate the site with hyaluronidase. Apply heat and compression.</td>
<td></td>
</tr>
<tr>
<td>Cytarabine</td>
<td></td>
<td>✓</td>
<td>Infiltrate the site with hyaluronidase. Apply heat and compression.</td>
<td></td>
</tr>
<tr>
<td>Dacarbazine</td>
<td></td>
<td>✓</td>
<td>Apply topical DMSO alternating with hydrocortisone cream and a cold compress.</td>
<td>Refer to further treatment of cytotoxic extravasation below. Patients should avoid intense exposure of the affected area to sunlight after extravasation. Surgical excision is sometimes required to prevent serious damage</td>
</tr>
<tr>
<td>Dactinomycin</td>
<td></td>
<td>✓</td>
<td>Apply topical DMSO alternating with hydrocortisone cream and a cold compress.</td>
<td>Refer to further treatment of cytotoxic extravasation below. Surgical excision is sometimes required to prevent serious damage</td>
</tr>
</tbody>
</table>

Patients should avoid intense exposure of the affected area to sunlight after extravasation. Surgical excision is sometimes required to prevent serious damage.
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</tr>
</thead>
<tbody>
<tr>
<td>Daunorubicin</td>
<td>✓</td>
<td>✓</td>
<td>Follow Appendix 3: Anthracycline Extravasation Management</td>
<td>Refer to further treatment of cytotoxic extravasation below. Surgical excision is sometimes required to prevent serious damage.</td>
</tr>
<tr>
<td>Daunorubicin Liposomal</td>
<td>✓</td>
<td>✓</td>
<td>Follow Appendix 3: Anthracycline Extravasation Management</td>
<td></td>
</tr>
<tr>
<td>Docetaxel</td>
<td>✓</td>
<td></td>
<td>Infiltrate the area with a mixture of hydrocortisone and chlorpheniramine as 0.2ml ‘pin cushion’ subcutaneous injections. Follow with hyaluronidase and then warm compression alternating with topical antihistamine cream.</td>
<td></td>
</tr>
<tr>
<td>Doxorubicin</td>
<td>✓</td>
<td>✓</td>
<td>Follow Appendix 3: Anthracycline Extravasation Management</td>
<td>Refer to further treatment of cytotoxic extravasation below. Surgical excision is sometimes required to prevent serious damage.</td>
</tr>
<tr>
<td>Doxorubicin Liposomal</td>
<td>✓</td>
<td>✓</td>
<td>Follow Appendix 3: Anthracycline Extravasation Management</td>
<td></td>
</tr>
<tr>
<td>Epirubicin</td>
<td>✓</td>
<td>✓</td>
<td>Follow Appendix 3: Anthracycline Extravasation Management</td>
<td></td>
</tr>
<tr>
<td>Etoposide</td>
<td>✓</td>
<td></td>
<td>Give 100mg hydrocortisone via cannula, then administer 100mg subcutaneous hydrocortisone as 0.2ml injections around the circumference of the affected area. Apply topical hydrocortisone and cover the area with an ice pack.</td>
<td>Possibility of local inflammation or necrosis and/or pain. There are no specific antidotes.</td>
</tr>
<tr>
<td>Etoposide Phosphate</td>
<td>✓</td>
<td></td>
<td>Give 100mg hydrocortisone via cannula, then administer 100mg subcutaneous hydrocortisone as 0.2ml injections around the circumference of the affected area. Apply topical hydrocortisone and cover the area with an ice pack. If the local reaction has then settled apply heat for a further 24 to 48 hours.</td>
<td>Possibility of local inflammation. S/C hyaluronidase may facilitate dispersion of large volume extravasations in addition to the warm compressions.</td>
</tr>
<tr>
<td>Floxuridine</td>
<td>✓</td>
<td></td>
<td>Infiltrate with 2.1% sodium bicarbonate. Apply heat (i.e. warm compress)</td>
<td>Extravasation is rare. See &quot;</td>
</tr>
<tr>
<td>Fludarabine</td>
<td>✓</td>
<td></td>
<td>Infiltrate the site with hyaluronidase. Apply heat and compression.</td>
<td></td>
</tr>
<tr>
<td>Drug</td>
<td>Specific Management</td>
<td>Additional Information</td>
<td></td>
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<tr>
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<td></td>
</tr>
<tr>
<td>Fluorouracil</td>
<td>Give 100mg hydrocortisone via cannula, then administer 100mg subcutaneous hydrocortisone as 0.2ml injections around the circumference of the affected area. Apply topical hydrocortisone and cover the area with an ice pack for the next 4 hours. If the local reaction has then settled apply heat for a further 24 to 48 hours. Possibility of local inflammation. S/C hyaluronidase may facilitate dispersion of large volume extravasations in addition to the warm compressions.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gemcitabine</td>
<td>Infiltrate the site with hyaluronidase, Apply heat and compression. Refer to further treatment of cytotoxic extravasation below. Surgical excision is sometimes required to prevent serious damage.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Idarubicin</td>
<td>Follow Appendix 3: Anthracycline Extravasation Management</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ifosfamide</td>
<td>Infiltrate the site with hyaluronidase, Apply heat and compression. Unlikely to cause tissue damage.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irinotecan</td>
<td>Give 100mg hydrocortisone via cannula, then administer 100mg subcutaneous hydrocortisone as 0.2ml injections around the circumference of the affected area. Apply topical hydrocortisone and cover the area with an ice pack for the next 4 hours. For large volume extravasation infiltrate with 2.1% sodium bicarbonate, followed by heat (i.e. warm compression). Extravasation is rare. See.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beta Interferons</td>
<td>Infiltrate the site with hyaluronidase, Apply heat and compression.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Melphalan</td>
<td>Infiltrate the site with hyaluronidase, Apply heat and compression. Possibility of local inflammation. S/C hyaluronidase may facilitate dispersion of large volume extravasations in addition to the warm compressions.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Methotrexate</td>
<td>Give 100mg hydrocortisone via cannula, then administer 100mg subcutaneous hydrocortisone as 0.2ml injections around the circumference of the affected area. Apply topical hydrocortisone and cover the area intermittently with an ice pack for the next 24 hours. If the local reaction has then settled apply heat for a further 24 to 48 hours. Surgical excision is sometimes required to prevent serious damage.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mitomyacin</td>
<td>Give dexamethasone 4mg via cannula then infiltrate with 8.4% sodium bicarbonate. Apply topical hydrocortisone cream and a cold compress. Surgical excision is sometimes required to prevent serious damage.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drug</td>
<td>Spread and Dilute</td>
<td>Localise and Neutralise</td>
<td>Specific Management</td>
<td>Additional Information</td>
</tr>
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</tr>
<tr>
<td>Mitozantrone</td>
<td>✓</td>
<td></td>
<td>Give 100mg hydrocortisone via cannula, then administer 100mg subcutaneous hydrocortisone as 0.2ml injections around the circumference of the affected area. Apply topical DMSO alternating with hydrocortisone cream and a cold compress.</td>
<td>Possibility of local inflammation or necrosis and/or pain</td>
</tr>
<tr>
<td>Mustine</td>
<td></td>
<td>✓</td>
<td>Infiltrate area with sodium thiosulphate. Introduce a further 100mg hydrocortisone to area. Apply cold compression for 12 hours.</td>
<td>Surgical excision is sometimes required to prevent serious damage</td>
</tr>
<tr>
<td>Oxaliplatin</td>
<td>✓</td>
<td></td>
<td>Infiltrate with hyaluronidase and a 500 ml bag of 5% dextrose plus further hyaluronidase should be placed in the centre of the extravasation area in a ‘hypodermoclysis’ fashion, the area warmed to aid dispersion. The fluid should be left up to 8 hours or until the 500ml is dissipated.</td>
<td>Caution in diabetic patients</td>
</tr>
<tr>
<td>Paclitaxel</td>
<td></td>
<td>✓</td>
<td>Infiltrate the area with a mixture of hydrocortisone and chlorphenamine as 0.2ml ‘pin cushion’ subcutaneous injections. Follow by hyaluronidase and then warm compressions alternated with the application of topical antihistamine cream.</td>
<td></td>
</tr>
<tr>
<td>Pentostatin</td>
<td>✓</td>
<td></td>
<td>Infiltrate the site with hyaluronidase. Apply heat and compression.</td>
<td>Possibility of local inflammation. S/C hyaluronidase may facilitate dispersion of large volume extravasations in addition to the warm compressions</td>
</tr>
<tr>
<td>Raltitrexed</td>
<td></td>
<td>✓</td>
<td>Give 100mg hydrocortisone via cannula, then administer 100mg subcutaneous hydrocortisone as 0.2ml injections around the circumference of the affected area. Apply topical hydrocortisone and cover the area with an ice pack for the next 4 hours. If the local reaction has then settled apply heat for a further 24 to 48 hours.</td>
<td></td>
</tr>
<tr>
<td>Rituximab</td>
<td>✓</td>
<td></td>
<td>Infiltrate the site with hyaluronidase. Apply heat and compression.</td>
<td>Refer to further treatment of cytotoxic extravasation below. Surgical excision is sometimes required to prevent serious damage</td>
</tr>
<tr>
<td>Streptozocin</td>
<td></td>
<td>✓</td>
<td>Apply topical DMSO alternating with hydrocortisone cream and a cold compress.</td>
<td></td>
</tr>
<tr>
<td>Drug</td>
<td>Spread and Dilute</td>
<td>Localise and Neutralise</td>
<td>Specific Management</td>
<td>Additional Information</td>
</tr>
<tr>
<td>------------</td>
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<td>-------------------------</td>
<td>---------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Teniposide</td>
<td>✓</td>
<td>✓</td>
<td>Give hydrocortisone via the cannula and s/c hydrocortisone as 0.2 ml multiple injections around the circumference of the affected area, apply topical hydrocortisone and cover the area with an ice pack. 2 h.</td>
<td>Possibility of local inflammation or necrosis and/or pain. There are no specific antidotes for these drugs.</td>
</tr>
<tr>
<td>Thiotepa</td>
<td>✓</td>
<td></td>
<td>Infiltrate the site with hyaluronidase. Apply heat and compression. 2 g</td>
<td>Extravasation is rare. See b</td>
</tr>
<tr>
<td>Topotecan</td>
<td>✓</td>
<td>✓</td>
<td>Infiltrate with 2.1% sodium bicarbonate. Apply heat (i.e. warm compress). 2 g</td>
<td>Effervescent is rare. See b</td>
</tr>
<tr>
<td>Trastuzumab</td>
<td>✓</td>
<td></td>
<td>Infiltrate the site with hyaluronidase. Apply heat and compression. 2 g</td>
<td>Extravasation is rare. See b</td>
</tr>
<tr>
<td>Treosulphan</td>
<td>✓</td>
<td>✓</td>
<td>Infiltrate with 2.1% sodium bicarbonate. Leave for 2 minutes and then aspirate again. Apply heat (i.e. warm compress). 2 g</td>
<td>Extravasation is rare. See b. Although surgical excision is sometimes required to prevent serious damage</td>
</tr>
<tr>
<td>Vinblastine</td>
<td></td>
<td></td>
<td>Infiltrate the area with hyaluronidase, as 0.2 ml injections, over and around the circumference of the affected area. Apply heat and compression. 1 g. Apply topical non-steroidal anti-inflammatory cream to the affected area four times daily for 7 days.</td>
<td></td>
</tr>
<tr>
<td>Vincristine</td>
<td></td>
<td></td>
<td>Infiltrate the area with hyaluronidase, as 0.2 ml injections, over and around the circumference of the affected area. Apply heat and compression. 1 g. Apply topical non-steroidal anti-inflammatory cream to the affected area four times daily for 7 days.</td>
<td></td>
</tr>
<tr>
<td>Vindesine</td>
<td></td>
<td></td>
<td>Infiltrate the area with hyaluronidase, as 0.2 ml injections, over and around the circumference of the affected area. Apply heat and compression. 1 g. Apply topical non-steroidal anti-inflammatory cream to the affected area four times daily for 7 days.</td>
<td></td>
</tr>
<tr>
<td>Vinorelbine</td>
<td></td>
<td></td>
<td>Infiltrate the area with hyaluronidase, as 0.2 ml injections, over and around the circumference of the affected area. Apply heat and compression. 1 g. Apply topical non-steroidal anti-inflammatory cream to the affected area four times daily for 7 days.</td>
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*Give hydrocortisone via the cannula and s/c hydrocortisone as 0.2ml multiple injections around the circumference of the affected area
1. On following days apply a topical non-steroidal anti-inflammatory cream to affected area, four times a day for the subsequent seven days
2. Manage the situation symptomatically.

Common managements for cytotoxic extravasations
a) Hyaluronidase: Dilute 1500units in 2ml of water for injection, or 0.9% sodium chloride. Gently massage area to facilitate dispersal.

b) Acidic Extravasations: If the extravasation has been misdiagnosed or the volume extravasated wrongly assessed, the treatment could lead to an alkali extravasation. If this secondary extravasation occurs, it is far more serious and the consequence far more devastating than those associated with venous extravasation. Caution and expert advice should be exercised before proceeding with this specific management.

c) Platinum Treatment Regime: Treatment administered within 24 hours should be ‘spread’ and dilute. Injuries not treated immediately should be localise and neutral.

d) Mixture: Infiltrate the area with 1-3ml of a 100mg hydrocortisone and 10mg chlorpheniramine up to 10ml with water for injection. Depending upon the size it may not be necessary to use the whole 3mls. Large-volume extravasation may need as much as 10ml.

e) Surgical excision: Moderate to severe pain persisting for 1-2 weeks after extravasation. Wide excision with use of grafts may be indicated.

f) Hypodermoclysis: The process of giving fluids under the skin as opposed to IV

g) Warm Compression W.C.C. Warm Continuous Compression. This involves applying firmly but without undue pressure a heat source (hot water bottle or small electrically heated blanket) to the area continuously for 24 hours. The heat source should not be in direct contact with the skin and a piece of dry gauze should be laid in between. This assists the natural dispersal of the drug.
h) Apply dimethylsulphoxide (DMSO) topically to the extravasated area. DMSO should be applied every 2 hours followed by topical hydrocortisone cream once the affected area has dried, and 30 minutes of cold compression for the first 24 hours after the injury. The cold source should however not be placed directly on the skin and a piece of dry gauze should be laid in direct contact. Treatment for the next 7 to 10 days should consist of topical application of DMSO at 6-hourly intervals alternating with 6-hourly applications of topical hydrocortisone cream, so that a preparation is being applied every 3 hours on an alternate basis. Contact with good skin should be avoided. If blistering occurs, stop DMSO and seek further advice.

i) Sodium Bicarbonate: Infiltrate with 1-3 ml of 2.1% sodium bicarbonate. To achieve 2.1% sodium bicarbonate from the 8.4% vial in the extravasation kit, take 5ml of 8.4% sodium bicarbonate, add 5ml of water for injection, discard 5ml of this new solution and add a further 5ml of water for injection. **Caution and expert advice should be exercised, before using this antidote.**

j) Sodium Thiosulphate: Infiltrate 1-3 ml of 3% isotonic sodium thiosulphate into the affected area using multiple 'pin cushion' injections. To achieve 3% sodium thiosulphate from the 50% vial in the extravasation kit, dilute 1.2ml of 50% to 20ml with water for injection

k) Cold Compression: P.C.C. Pulsed Cold Compress. This involves applying, firmly but without pressure a cold source (crushed ice, flexible cold pack or cold bandage) intermittently (for 30 minutes in every 2 hours) over the area for the first 24 hours, unless advised otherwise.

References


Mount Vernon Cancer Network. Management of Extravasation of Cytotoxic Chemotherapy from a Peripheral or Centrally Inserted (CVAD) Device. Version 7 Jan 2010


Extravasation.org website. Available at [http://www.extravasation.org.uk](http://www.extravasation.org.uk) [accessed 01.02.10]

Appendix 1: Suggested Contents of extravasation kit/ stock on ward

- Cold pack (stored in ward/unit drug refrigerator)
- Hydrocortisone Injection 100mg
- Hydrocortisone cream 1%, 15g
- Sodium Bicarbonate 8.4% Injection
- Sodium Thiosulphate 50% Injection
- Chlorpheniramine 10mg Injection
- Antihistamine Cream
- Non-steroidal anti-inflammatory cream
- Hyaluronidase 1500 IU/ampoule
- Dimethylsulphoxide (DMSO)
- Syringes (2ml)
- Syringes (10ml)
- Syringes (20ml)
- 21G needles (for drawing up)
- 25G needles (for injecting)
- Water for injection 5ml
- Alcohol swabs
- Green Card for reporting (copy to be put in patients notes)
Appendix 2: Suggested Patient information Leaflet

MANAGING SUSPECTED EXTRAVASATION

Extravasation is a rare complication of chemotherapy. This occurs when chemotherapy that is administered straight into the vein, leaks out of that vein into surrounding tissues and skin. Some of the drugs used for chemotherapy can be very irritant if they leak out of veins. This may make the surrounding tissues and skin inflamed and sore. Usually this is just uncomfortable or a bit painful for some time but very rarely it can cause serious skin damage.

It is possible that some of the chemotherapy that you received today may have leaked out from the vein. This may cause skin irritation, sores or injury around the area of leakage. Once you go home, your chemotherapy nurse will be calling you on a regular basis to monitor your condition.

How to take care of your site (your nurse will tick the appropriate box and supply you with antidotes required to manage your extravasation)

- Elevate the affected arm on a pillow whenever possible to help reduce the swelling.
- Apply dimethylsulphoxide (DMSO) to affected area every 6 hours, alternating with hydrocortisone cream 1% every 6 hours. This means that a preparation is applied every 3 hours on an alternative basis. Apply for at least 7 days.
- If blistering occurs, stop DMSO and seek medical advice. Do not cover with occlusive dressings. If you need to cover the area, allow the medication to dry before covering.
- Apply hydrocortisone cream 1% every 6 hours.
- Apply cold pack intermittently for 30 minutes every 2 hours for 24 hours. Do not put cold pack directly on skin. Use a dry gauze in direct contact with your skin then place cold pack on gauze.
- Apply warm pack continuously for 24 hours. Do not put warm pack directly on skin. Use a dry gauze in direct contact with your skin then place warm pack on gauze.
  - Do not apply any lotion, cream or ointment unless advised by your doctor or nurse.
  - Do not expose the area to direct sunlight or UV lamps.
  - Avoid clothing that constricts the affected area.
  - Avoid wetting the area. If necessary apply dressing to protect the area.

Seek medical advice

- If you develop a fever
- If you notice any changes at the site, including increased pain, redness, blisters or swelling.
Appendix 3: Anthracycline Extravasation Management

An eligibility data proforma MUST be completed for each use of Savene ®.

To obtain the kit
Please contact the company to obtain a kit for stock. Sharing of a kit between trusts is permitted as long as there is a procedure in place to obtain the kit in a timely manner and this is monitored. Patient care should not be compromised.

Dosing details:
Savene should be given once daily for 3 consecutive days. The recommended dose is 1000mg/m² on days 1 and 2 and 500mg/m² on day 3. For patients with a BSA of more than 2 m² the single dose should not exceed 2000mg. Treatment Day 2 and Day 3 should start at the same hour (+/- 3 hours) as on the first day.

The indicated dose should be administered as an intravenous infusion over 1-2 hours into a large vein in extremity/area other than the one affected by the extravasation. The first infusion should be initiated as soon as possible and within the first six hours after the accident. Cooling procedures such as ice packs should have been removed from the area at least 15 min before the Savene administration in order to allow sufficient blood flow.

Before infusion, Savene powder must be reconstituted with 25 ml sterile water to give a concentration of 20 mg dexrazoxane per ml sterile water. After reconstitution the solution should be further diluted in the bag with the Savene diluent.

Side Effects
A number of published reports comprising more than 1000 patients have demonstrated a uniform pattern of dose dependant adverse reactions such as nausea/vomiting, diarrhoea, stomatitis, bone marrow suppression (neutropenia, thrombocytopenia) and affected liver function (increased ALT/AST). All adverse reactions have been rapidly reversible.

For more information please refer to SPC.
ECN CHEMOTHERAPY BOARD

Eligibility Data Proforma for ECN CB
Date agreed by ECN CB: TBC

Version 1

Anthracycline Extravasation

**Trust:**
- Basildon
- Chelmsford
- Colchester
- Southend

**Hospital number:** __________________________

**NHS number:** _____________________________

**Date of assessment:** _______________________

**Eligibility:** A tick in a grey box means ineligible

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<td>Treatment can be given within 6 hours of suspected extravasation</td>
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<td>Contraindications to Savene ®</td>
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<td>Impaired renal or hepatic function</td>
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Please file this sheet in the patients notes and send a copy of this form to Essex Cancer Network Pharmacist, Swift House, Hedgerows Business Park, Colchester Road, Chelmsford, Essex. CM2 5PF