## MANAGEMENT OF EXTRAVASATION POLICY

<table>
<thead>
<tr>
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</thead>
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<tr>
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<td>Target audience:</td>
<td>All clinical staff involved in the intravenous administration of drugs, in particular chemotherapy</td>
<td>Equality Impact Assessment:</td>
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### Key points
- How to manage an extravasation
- Responsibilities of key staff groups
- Monitoring extravasation incidents
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1. ASSOCIATED DOCUMENTS
Greater Manchester & Cheshire Cancer Network Chemotherapy Administration Policy

2. INTRODUCTION

2.1 Statement of intent
This policy is the Trust approved document for managing the risks from extravasation which are associated with the administration of certain intravenous treatments including chemotherapy. It sets down general principles for dealing with an extravasation as well as drug-specific measures.

2.2 Equality Impact Assessment
This guidance endeavours to deliver care in such a way as to treat patients fairly and respectfully regardless of age, gender, race, ethnicity, religion/belief, sexual orientation and/or disability. The care and treatment provided will respect the individuality of each patient. In line with the Trust policy on equality and diversity this document has been screened using the approved e-tool.

2.3 Good Corporate Citizen
As part of its development, this policy was reviewed in line with the Trust's Corporate Citizen ideals. As a result, the document is designed to be used electronically in order to reduce any associated printing costs.

2.4 Purpose
The purpose of this document is to set out Trust standards for the prevention of extravasation and treatment should an extravasation incident occur.

2.5 Scope
This policy is applicable to all clinical staff involved with the administration of intravenous drugs in particular chemotherapy and the staff caring for patients receiving such treatment.

3. DEFINITIONS

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extravasation</td>
<td>Accidental leakage into surrounding tissue from the vein usually occurring when intravenous (IV) medication passes from the blood vessels into the tissue around the blood vessels and beyond. Depending upon the substance that extravasates, injury can range from very mild skin reactions to necrosis.</td>
</tr>
<tr>
<td>Vesicant</td>
<td>Vesicants are drugs (cytotoxic or non-cytotoxic) with the potential to cause blistering and ulceration and if left untreated, tissue necrosis (see table 1, page 4).</td>
</tr>
<tr>
<td>Non-vesicant (also known as infiltrates)</td>
<td>Some non-vesicants may still cause a reaction if they extravasate: Exfoliants - inflammation and shedding of the skin Irritants - inflammation and irritation Inflammantants - mild to moderate inflammation and flare Neutrals - inert compounds</td>
</tr>
</tbody>
</table>
Table 1: Classification of vesicants (drugs with the potential to cause tissue damage)

<table>
<thead>
<tr>
<th>Cytotoxic drugs</th>
<th>Hyperosmolar agents</th>
<th>Potentially damaging acid and alkaline agents</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Actinomycin D</td>
<td>Ψ Calcium chloride</td>
<td>*Aciclovir</td>
</tr>
<tr>
<td>*Amrubicin</td>
<td>Ψ Calcium gluconate 10%</td>
<td>Ψ Aminophylline</td>
</tr>
<tr>
<td>*Amsacrine</td>
<td>Ψ Hypertonic glucose (10% or &gt;)</td>
<td>*Amiodarone</td>
</tr>
<tr>
<td>*Carmustine</td>
<td>Ψ Hypertonic sodium chloride (10% or &gt;)</td>
<td>*Amphotericin B</td>
</tr>
<tr>
<td>*Dacarbazine</td>
<td>* Magnesium sulphate 20%</td>
<td>*Cefotaxime</td>
</tr>
<tr>
<td>*Daunorubicin</td>
<td>* Mannitol 10% &amp; 20%</td>
<td>*Co-trimoxazole</td>
</tr>
<tr>
<td>Ψ Docetaxel</td>
<td>Ψ Parenteral nutrition</td>
<td>*Diazepam</td>
</tr>
<tr>
<td>*Doxorubicin</td>
<td>*Potassium Phosphate</td>
<td>*Digoxin</td>
</tr>
<tr>
<td>*Epirubicin</td>
<td>*Potassium Chloride &gt;40mmol/l</td>
<td>*Erythromycin</td>
</tr>
<tr>
<td>*Idarubicin</td>
<td>*Sodium bicarbonate</td>
<td>*Foscarnet sodium</td>
</tr>
<tr>
<td>*Mitomycin C</td>
<td>Ψ X-ray Contrast media</td>
<td>*Ganciclovir</td>
</tr>
<tr>
<td>Ψ Paclitaxel</td>
<td>Vascular regulators</td>
<td>*GTN infusion</td>
</tr>
<tr>
<td>*Streptozocin</td>
<td>Ψ Adrenaline (Epinephrine)</td>
<td>*Methylene Blue</td>
</tr>
<tr>
<td>Ψ Treosulfan</td>
<td>Ψ Dobutamine</td>
<td>Ψ Phenylethoin</td>
</tr>
<tr>
<td>*Trabectedin</td>
<td>Ψ Dopamine</td>
<td>*Thiopental</td>
</tr>
<tr>
<td>Ψ Vinblastine</td>
<td>Ψ Noradrenaline (Norepinephrine)</td>
<td>*Vancomycin</td>
</tr>
<tr>
<td>Ψ Vincristine</td>
<td>* Prostaglandins</td>
<td></td>
</tr>
<tr>
<td>Ψ Vindesine</td>
<td>* Vasopressin</td>
<td></td>
</tr>
<tr>
<td>Ψ Vinorelbine</td>
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</tbody>
</table>

*BLUE = apply cold compress to affected area for 20 minutes to localise and neutralise 4x daily for 24-48 hours plus antidote if indicated. See page 10

Ψ RED = apply warm compress to affected area for 20 minutes to disperse and dilute 4x daily for 24-48 hours plus hyaluronidase. See page 14
4. DUTIES

4.1 Safe Medicines Practice Committee
The ‘Safe Medicines Practice Committee’ is responsible for:
- Review of extravasation reports from Chemotherapy Delivery Group
- Monitoring the reports of extravasation
- Review of incidents and near misses with recommendations and actions to minimise recurrence

4.2 Drugs and Therapeutics Committee
The ‘Drugs and Therapeutics Committee’ is responsible for:
- Review and approval of the extravasation policy

4.3 Chemotherapy Delivery Group
The ‘Chemotherapy Delivery Group’ is responsible for:
- Consideration and updating the extravasation policy
- Ensuring compliance with the extravasation policy
- Monitoring extravasation incidence and audits, and advising action in response to the data
- Reporting to Safe Medicines Practice Group a summary of any incidences on a monthly basis

4.4 Clinical Skills Team
The ‘Clinical Skills Team’ are responsible for:
- Annual audit of effectiveness of extravasation policy

4.5 Chemotherapy Nurse Team Leader and IV Nurse Trainer
Responsible for:
- Review and Updating the extravasation policy
- Nurse training and awareness

4.6 Ward Managers
Ward managers are responsible for:
- Ensuring staff are compliant with policy
- Ensuring staff are trained so that they know how to manage an extravasation
- Ensuring the extravasation kit is checked weekly for completeness and is easily accessible

4.7 Nursing Staff
Nursing staff are responsible for:
- Adhering to the policy
- Informing the patient of an extravasation incident
- Documenting all extravasation incidents
- Completion of the national e-card for reporting an extravasation
- Making arrangements for patient follow-up
- Ensuring any items used from extravasation kit are replaced
4.8 Medical Staff
Medical staff are responsible for:
- Timely prescribing of any drugs that are used in the management of extravasation.
- Advising on the appropriate clinical management and follow-up after an extravasation

4.9 Pharmacy
Pharmacy are responsible for:
- The prompt issue of advice when asked by clinical staff
- The prompt issue of treatment in response to a prescription following an extravasation
- The prompt issue of any drugs required to re-fill extravasation kit
- Review and update of relevant sections of the extravasation policy

5. PREVENTION OF EXTRAVASATION
Although it is recognised that extravasation is a risk associated with the intravenous administration of medication this risk must be proactively managed with the aim of preventing an incident.

5.1 Risk Factors
The risk of extravasation is increased in the following cases:
- cannulation in the antecubital fossa or over joint spaces
- very young or elderly patients
- unconscious, sedated or confused patients
- patients who have had multiple venepuncture or cannula sites
- patients who have undergone breast or lymph node surgery
- patients suffering from decreased sensation or circulation
- patients with superior vena cava obstructions
- inadequate securing of the cannula
- inadequate visibility of the cannula and surrounding tissue
- vesicant and cytotoxic medications
- central venous access devices (CVADs) - diagnosis of extravasation can be delayed therefore extra vigilance is required

NB: For tunnelled devices, a clear view of the tunnelled area must be visible throughout administration

5.2. Management of risk

5.2.1 Staff involved in the IV administration of medicines must ensure that:
- They have the required knowledge and competence to do so safely – see events diary for IV study day details
- Only chemotherapy trained practitioners administer cytotoxic drugs
- Only level 3 trained staff administer anthracyclines and other vesicant chemotherapy treatments
- Patients are provided with a clear explanation of the treatment and the possible risk of extravasation and how this would be managed should it occur
- They are vigilant and maintain regular dialogue with patients during and post administration
5.2.2 Local time restrictions
- Bolus injection anthracyclines must not routinely be administered after 1800 Monday to Friday (after 1800 the decision to administer is at the discretion of the department manager and must focus on patient safety).
- Anthracycline infusions – less than 24 hours duration – must be completed by 20:00
- Anthracycline infusions – 24 hours or longer - must be commenced by 1600 to ensure initial monitoring occurs within normal working hours.

6. SIGNS AND SYMPTOMS OF EXTRAVASATION
The practitioner must constantly assess the cannulation site/tunelled CVC site and the surrounding tissue for any signs and symptoms of possible extravasation these may occur immediately after the blood vessel has been breached and may include:
- changes in sensation or pain
- changes in infusion quality (e.g. free flowing IV slowing down)
- swelling at the cannulation site or along the vein pathway
- induration
- erythema
- venous discolouration/blanching
- absence of blood return
- increased resistance when administering IV drugs
- inflammation or blistering

CVC devices
- aching discomfort in the shoulder/neck – this is the most common
- pain, burning, aching/discomfort, swelling of chest wall
- fluid leakage at or around exit site and along subcutaneous canal

7. MANAGEMENT OF EXTRAVASATION
Specific courses of action depend upon:
- The nature of the drug
- How much has extravasated
- The location of the extravasation

If an extravasation is suspected treatment must begin as soon as possible. Early detection and starting treatment within 24 hours can significantly reduce tissue damage. However in some cases extravasation may only become apparent 1-4 weeks after administration.

If extravasation has occurred from a mix of more than one vesicant e.g. CHOP regimen, then treat as for doxorubicin.

See appendix 1 for summary flow chart.

7.1 Procedure for the IMMEDIATE management of peripheral extravasation
a) Stop and disconnect the infusion/ bolus immediately. DO NOT remove the cannula. Cap off the syringe on the giving set.

b) Explain to the patient what you suspect has happened and the procedure to deal with it.
c) Inform the chemotherapy team and medical staff immediately via bleep and collect an extravasation kit (these are available in each clinical location where chemotherapy is administered).

d) Leave the cannula/needle in place and try to aspirate as much of the drug as possible from the cannula with a 10ml luer lock syringe. Try to draw blood from the cannula.

e) Mark around the affected area with an indelible pen.

f) For all vesicants drugs (and any others as judged clinically appropriate) - request a digital image to be taken by Medical Illustration. For extravasations outside working hours, arrange a digital image to be taken at the earliest opportunity.

g) Remove the cannula/needle.

h) DO NOT apply direct manual pressure to suspected extravasation site.

i) Is the drug a vesicant? Check classification in table 1 (page 4) Non-vesicant drugs may still cause a reaction on extravasation. If the drug is not included in table 1, check the “localize/neutralize” table (page 10) and the “disperse/dilute” table (page 14) and follow the individual drug extravasation management plan.

**IF EXTRAVASATION IS CERTAIN** and large scale inflammation, flare or fracturing has occurred along the vein - inject the steroid hydrocortisone 100mg (2mls) as 0.1-0.2mls injection at approx 6 - 8 points around the circumference (National Extravasation guideline 2007).

j) Administer pain relief (if required) as prescribed.

k) Encourage patient to move limb and elevate for 48 hours.

l) Complete all relevant documentation (see appendix 3).

m) Supply patient with information leaflet (see appendix 2).

n) Arrange follow up out-patient/in-patient appointment for the patient and document in the notes.

 o) Arrange referral to the plastic surgeons in severe cases.

p) Refill extravasation kit.

7.2 Procedure for the IMMEDIATE management of extravasation via a central venous access device (CVAD)

a) Stop and disconnect the infusion/bolus immediately. DO NOT remove the central venous catheter (central line), PICC line or portacath. Cap off the syringe on the giving set.

b) Explain to the patient what you suspect has happened and the procedure to deal with it.
c) Inform the chemotherapy team and medical staff immediately via bleep and collect an extravasation kit (these are available in each clinical location where chemotherapy is administered).

d) Leave the CVAD in place and try to aspirate as much of the drug as possible from the cannula with a 10ml luer lock syringe. Try to draw blood through the CVAD.

e) Mark around the affected area with an indelible pen.

f) For all vesicants drugs (and any others as judged clinically appropriate) - request a digital image to be taken by Medical Illustration. For extravasations outside working hours, arrange a digital image to be taken at the earliest opportunity.

g) DO NOT apply direct manual pressure to suspected extravasation site.

h) Is the drug a vesicant? Check classification in table 1 on page 4. Non-vesicant drugs may still cause a reaction on extravasation. If the drug is not included in table 1, check the “localise/neutralize” table (page 10) and the “disperse/dilute” table (page 14) and follow the individual drug extravasation management plan.

i) Administer pain relief (if required) against a valid signed prescription.

j) Arrange for line removal. If Hickman line or port: consider seeking advice from plastic surgeons regarding line removal to minimize tissue damage.

k) For all CVADs: a referral to the plastic surgeons must be considered at the earliest opportunity.

l) Encourage patient to move limb and elevate for 48 hours.

m) Complete all relevant documentation (see appendix 3).

n) Supply patient with information leaflet (see appendix 2).

o) Arrange follow up out-patient/in-patient appointment for the patient and document in notes. All patients with CVAD extravasations must return for assessment of the affected area within 48 hours following the extravasation.

p) Refill extravasation kit.

7.3 Subsequent management of extravasation
Subsequent management is based on two different principles (the method used depends on the drug and its vesicant potential - table 1, 4):

a) Localise and neutralize (page 10): Applying a cold source to the extravasation site causes vasoconstriction, localising the drug. An antidote can be used at this stage to neutralise the drug, depending on the drug and volume of extravasation. The drug will then be dispersed via the local vascular and lymphatic systems.

b) Disperse and dilute (page 14): Applying a heat source to the extravasation site causes vasodilation, increasing distribution and absorption and decreasing the local drug concentration.
### 7.3.1 LOCALISE AND NEUTRALISE

Table 2: Drugs when the localise and neutralise procedure must be used

<table>
<thead>
<tr>
<th>Cytotoxic drugs</th>
<th>Non-cytotoxic drugs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>β Actinomycin D (Dactinomycin)</strong></td>
<td>Amiodarone</td>
</tr>
<tr>
<td>Amrubicin</td>
<td>Amphotericin</td>
</tr>
<tr>
<td><strong>β Amsacrine</strong></td>
<td>Aciclovir</td>
</tr>
<tr>
<td>Azacitidine: see note below</td>
<td>Cefotaxime</td>
</tr>
<tr>
<td>Arsenic Trioxide</td>
<td>Clarithromycin</td>
</tr>
<tr>
<td>Bendamustine</td>
<td>Co-trimoxazole</td>
</tr>
<tr>
<td>Bortezomib: see note below</td>
<td>Diazemuls</td>
</tr>
<tr>
<td>Busulphan</td>
<td>Diazepam</td>
</tr>
<tr>
<td><strong>β Carmustine</strong></td>
<td>Digoxin</td>
</tr>
<tr>
<td><strong>β Dacarbazine</strong></td>
<td>Erythromycin</td>
</tr>
<tr>
<td>Δ Daunorubicin</td>
<td>Foscarnet</td>
</tr>
<tr>
<td>Δ Doxorubicin</td>
<td>Ganciclovir</td>
</tr>
<tr>
<td>Δ Epirubicin</td>
<td>GTN infusion</td>
</tr>
<tr>
<td>Etoposide</td>
<td>Magnesium sulphate 20%</td>
</tr>
<tr>
<td>Etoposide Phosphate: see note below</td>
<td>Mannitol</td>
</tr>
<tr>
<td>Fluorouracil: see note below</td>
<td>Methylened Blue</td>
</tr>
<tr>
<td>Δ Idarubicin</td>
<td>Phenobarbitone</td>
</tr>
<tr>
<td>Irinotecan</td>
<td>Potassium chloride &gt; 40mmol/l</td>
</tr>
<tr>
<td><strong>β Liposomal doxorubicin: see note page 13</strong></td>
<td>Potassium phosphate</td>
</tr>
<tr>
<td>Methotrexate: see note below</td>
<td>Prostaglandins</td>
</tr>
<tr>
<td><strong>β Mitomycin C</strong></td>
<td>Thiopental</td>
</tr>
<tr>
<td><strong>β Mitoxantrone</strong></td>
<td>Vancomycin</td>
</tr>
<tr>
<td>Raltitrexed: see note below</td>
<td>Vasopressin</td>
</tr>
<tr>
<td><strong>β Streptozocin</strong></td>
<td></td>
</tr>
<tr>
<td>Topotecan</td>
<td></td>
</tr>
<tr>
<td>Trabectedin</td>
<td></td>
</tr>
</tbody>
</table>

**Azacitidine, Bortezomib, Etoposide phosphate (Etopophos), Fluorouracil, Methotrexate, Raltitrexed:** Apply topical hydrocortisone 1% and an ice pack for the first 24 hours (see below). If the local reaction settles apply heat for a further 24-48 hours. Subcutaneous hyaluronidase may facilitate dispersion of large volume extravasations in addition to the warm compressions, see page 13.
Δ: Anthracyclines: Daunorubicin, Doxorubicin, Epirubicin, Idarubicin
Where extravasation volume is:

<table>
<thead>
<tr>
<th>Volume</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1.5ml</td>
<td>No antidote, cold compress and hydrocortisone</td>
</tr>
<tr>
<td>1.5-3ml</td>
<td>Topical DMSO (see page 12), cold compress and hydrocortisone</td>
</tr>
<tr>
<td>&gt; 3ml</td>
<td>Savene (see below), remove cold compress 15 minutes prior to administration and do not reapply for 4 hours post administration. Do not use Savene in conjunction with DMSO or steroid treatment.</td>
</tr>
</tbody>
</table>

β: Anthracyclines (1.5 – 3ml extravasation), Actinomycin D, Amsacrine, Carmustine, Dacarbazine, Liposomal Doxorubicin (Caelyx and Myocet), Mitomycin C, Mitoxantrone and Streptozocin.
Use DMSO (see page 12)

7.3.1.1 Procedure for localise and neutralise
a) Place a piece of dry gauze on the affected skin.

b) Apply cold compress to affected area for 20 to 30 minutes. Apply the compress firmly, but without undue pressure.

c) Use antidote if indicated. Ensure this is prescribed.

d) Repeat cold compress four times daily for 24 - 48hrs.

e) Use hydrocortisone cream 1% if local inflammation occurs.

7.3.1.2 Antidotes

**Savene® (Dexrazoxane)**
Licensed for treatment of anthracycline extravasation.
Anthracyclines = Daunorubicin, Doxorubicin, Epirubicin and Idarubicin
**Savene is not recommended for liposomal anthracycline extravasation**

Savene is a very expensive drug and MUST be recommended by one of the following:
- Chemotherapy nurse (vesicant chemotherapy trained)
- Nurse practitioner
- Consultant

Savene must be prescribed by a consultant, or on the directions of a consultant, on a pre-printed chemotherapy prescription form.

To be used for peripheral extravasation >3ml or extravasation of any volume via the central route (including PICC lines).

First dose must be initiated within 6 hours of extravasation.
Remove cooling 15 minutes prior to administration and do not reapply for 4 hours post administration. Do not use Savene in conjunction with DMSO or steroid treatment.

**Administration**
- By IV infusion over 1 - 2 hours into a large vein
- In an extremity/area other than the one infected by the extravasation
- Once daily dose for 3 consecutive days
- Doses to be capped at 2m²

Day 1 – 1000mg/m² as soon as possible (must be within 6 hours)
Day 2 – 1000mg/m² 24 hours after initial dose +/- 3 hours
Day 3 – 500mg/m² 24 hours after 2nd dose (+/- 3 hours from initial dose)

**Notes** (See SPC for further information)
- Not recommended in patients with hepatic or renal impairment
- Not recommended in combination with live attenuated vaccines (contraindicated with Yellow Fever Vaccine).
- Not recommended in combination with phenytoin.
- Potassium and sodium blood levels must be monitored.
- Patients on anticoagulants must be monitored daily whilst on dexrazoxane.
- **Savene is CYTOTOXIC. Haematological toxicity (nadir 11-12 days) may add to that of treatment already received.**
- Other side affects include nausea and vomiting and raised LFTs

**Preparation:**
Savene will be prepared by pharmacy at the following times:
- Monday to Friday – in working hours and on-call up to 8pm
- Saturday, Sunday and Bank Holidays on-call from 9am to 8pm
Outside this time Savene will be provided by the on-call pharmacist, but prepared at ward level by trained staff using the CareFusion system.

**DMSO 50-99% (Dimethyl sulphoxide)**
Unlicensed indication

Antidote for anthracylines (1.5 – 3ml extravasation) and drugs marked β (Actinomycin D, Amsacrine, Carmustine, Dacarbazine, Mitomycin C, Mitoxantrone and Streptozocin).

To be used only on intact skin (i.e. not blistered from extravasation). DMSO must be applied as soon as possible after extravasation.
**Procedure**

a) Draw around the area with indelible pen.

b) Apply the DMSO by painting it on to the marked area with a cotton bud.

c) Repeat this every 2 hours for the first 24 hours and then four times daily for 5-7 days.

d) Do not use an occlusive dressing. If required cover once the area is dry.

e) Apply topical hydrocortisone 1% cream in-between DMSO applications to reduce local inflammation.

f) Continue with cold compress as described in general procedure above.

**Notes:** Avoid contact with good skin; nursing staff should wear gloves.

If blistering occurs seek medical advice, **DO NOT apply DMSO to blistered skin.**

Avoid intense exposure to sunlight.

**Liposomal doxorubicin**

The liposome formulation offers some initial protection from the vesicant doxorubicin. However, the liposome is degraded over 2-3 weeks, potentially resulting in full blown extravasation. **Continue DMSO application four times daily for 10-14 days.**

### 7.3.2 DISPERSE AND DILUTE

#### 7.3.2.1 Procedure for disperse and dilute

a) Dilute 1500units hyaluronidase in 2ml water for injection or sodium chloride 0.9%.

b) Inject the hyaluronidase subcutaneously at points of the compass around the area of extravasation.

c) Gently massage the area to facilitate dispersal

**Note:**

Hyaluronidase increases the absorption of local anaesthetic. If local anaesthetic has been applied to the area (e.g. Ametop, Emla) prior to cannulation and within 6 hours of extravasation, then the patient must be monitored for signs and symptoms of systemic anaesthesia such as increased pulse rate and decreased respirations and the doctor informed immediately via bleep.

d) Use hydrocortisone cream 1% if local inflammation occurs. Recommended for cisplatin, carboplatin, docetaxel and paclitaxel.

e) Place a piece of dry gauze on the affected skin.

f) Apply warm compress to affected area for 20 minutes to aid the natural dispersal of the drug and to aid absorption of the hyaluronidase. Apply the compress firmly, but without undue pressure.

g) Repeat the warm compress four times daily for 24-48hrs.
Table 3: Drugs when the disperse and dilute procedure must be used:

<table>
<thead>
<tr>
<th>Cytotoxic Drugs</th>
<th>Non-cytotoxic drugs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bleomycin</td>
<td>Adrenaline (epinephrine)</td>
</tr>
<tr>
<td>Cladribine</td>
<td>Asparaginase</td>
</tr>
<tr>
<td>Clofarabine</td>
<td>Aminophylline</td>
</tr>
<tr>
<td>Cyclophosphamide</td>
<td>Calcium chloride</td>
</tr>
<tr>
<td>Cytarabine</td>
<td>Calcium gluconate 10%</td>
</tr>
<tr>
<td>Fludarabine</td>
<td>Dobutamine</td>
</tr>
<tr>
<td>Gemcitabine</td>
<td>Dopamine</td>
</tr>
<tr>
<td>Ifosfamide</td>
<td>Hypertonic solutions i.e. sodium chloride 0.9%, glucose 10% or more</td>
</tr>
<tr>
<td>Melphalan</td>
<td>Interferon</td>
</tr>
<tr>
<td>Nelarabine</td>
<td>Interleukin-2 (Aldesleukin)</td>
</tr>
<tr>
<td>Oxaliplatin</td>
<td>Noradrenaline (nor-epinephrine)</td>
</tr>
<tr>
<td>Pemetrexed</td>
<td>Sodium bicarbonate</td>
</tr>
<tr>
<td>Pentostatin</td>
<td>Parenteral nutrition</td>
</tr>
<tr>
<td>Thiotepa</td>
<td>Phenytoin</td>
</tr>
<tr>
<td>Treosulphan</td>
<td>X-ray contrast media</td>
</tr>
<tr>
<td>Carboplatin and Cisplatin:</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Carboplatin and Cisplatin:</strong></td>
</tr>
<tr>
<td></td>
<td>Use “disperse and dilute” if treatment administered within 24 hours.</td>
</tr>
<tr>
<td></td>
<td>For incidents not treated immediately use “localise and neutralize”.</td>
</tr>
<tr>
<td>Taxanes: see note below</td>
<td>Within 4- 6 weeks of an acute event a spontaneous deposit of platinum is precipitated in the tissue causing pain, inflammation and necrosis.</td>
</tr>
<tr>
<td>Docetaxel</td>
<td>N</td>
</tr>
<tr>
<td>Paclitaxel</td>
<td>c</td>
</tr>
<tr>
<td>Vinca alkloids:</td>
<td></td>
</tr>
<tr>
<td>Vinblastine</td>
<td></td>
</tr>
<tr>
<td>Vincristine</td>
<td></td>
</tr>
<tr>
<td>Vindesine</td>
<td></td>
</tr>
<tr>
<td>Vinorelbine</td>
<td></td>
</tr>
</tbody>
</table>

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7.3.4 Drugs not listed
If there is a suspected extravasation with an agent not listed in this policy, please contact pharmacy for advice. In general, topical cooling seems to be more effective than topical warming in the management of vesicants.

For investigational medicinal products (IMPs) check the clinical trial protocol for the appropriate management procedure.

For additional information or advice: see the national extravasation information service on www.extravasation.org.uk

8. CONTENTS OF AN EXTRAVASATION KIT

- Dimethyl sulfoxide (DMSO/RIMSO 50%-99%)
- Hyaluronidase 1500 units
- Hydrocortisone cream 1%
- Water for injection
- Yellow bag for disposal
- E-card for reporting incident to the national extravasation information service
  – vesicants only (see 8.2)
- Luer lock needles
- Luer lock syringes 2ml, 5ml, 10ml
- Hot/cold pack
- Dressing
- Gauze
- Non-sterile gloves
- Bandage
- Sling
- Safety glasses optional

The kit must be tamper-proof and checked each week by ward staff by ensuring the seal has not been broken. Replacement drugs must be obtained from pharmacy following use.

9. DOCUMENTING AND REPORTING

a) All extravasation incidents must be clearly documented in the patient medical notes by the practitioner together with details of action taken and follow up appointments made.

b) The extravasation must be reported as a clinical incident on the Trust Datix reporting system and an e-card on www.extravasation.org.uk/greencard.htm must be completed for the national extravasation information service.
c) Information documented must include;
   - patient name and hospital number
   - clinical area
   - date and time of extravasation
   - name of extravasated drug and volume (approx)
   - signs and symptoms

Description of the IV access including:
   - site
   - size and position of cannula
   - number of attempts at obtaining venous access and positions
   - drugs administration sequence
   - technique used and blood return

Description of extravasation area:
   photograph of area, size and appearance

Step-by-step management with the date and time of each step performed and medical notification:
   - aspiration is possible (volume) or not, location (IV or SC)
   - cold/heat
   - antidote used (where applicable)
   - referral details

10. CONSULTATION, APPROVAL & RATIFICATION PROCESS
The 'Chemotherapy Delivery Group' are responsible for reviewing this policy and will arrange for its update by the Chemotherapy Nurse Team Leader and IV Nurse Team Leader. Pharmacy will review and update the relevant drug related sections of the policy and comments will also be sought from key medical leads. This document requires approval by the ‘Drugs and Therapeutics Committee’ and ratification by the ‘Document Ratification Committee’.

11. DISSEMINATION & IMPLEMENTATION

11.1 Dissemination
This policy will be available on the Trust intranet and sent to managers within the trust for dissemination to the relevant staff within their areas of responsibility.

11.2 Implementation
Successful implementation of this policy will be evident through the regular monitoring of the number of extravasation incidents and their clinical outcomes.

11.3 Training/Awareness
Nurse training and awareness will be led by the IV nurse trainer, liaising with ‘Learning and Development’ as necessary. Competencies are completed during initial chemotherapy administration training. This includes theoretical knowledge and practical administration. Subsequently staff are required to have annual updates of chemotherapy administration.
12. PROCESS FOR MONITORING EFFECTIVE IMPLEMENTATION
An annual audit of effectiveness of this policy will be undertaken by the ‘Clinical Skills Team’ (appendix 4). An audit sample size of six extravasation incidents will be checked for evidence of compliance with this policy. Results will be reported to the ‘Chemotherapy Delivery Group’ who will act on any findings as necessary.

Serious incidents would be reported and followed up via the Trust incident reporting system and action plans monitored by the relevant committee.

A report on extravasation incidents will be received monthly by the ‘Safe Medicines Practice Committee’. Actions will be monitored through minutes of meetings.

13. REFERENCES
Sculmeister L. Extravasation. The MASCC Textbook of Cancer Supportive Care and Survivorship: 2011 Chapter 34; 351-359


Protocol for Management of Chemotherapy Extravasations: Chemotherapy Executive Group at St Chad's Unit, City Hospital Birmingham, UK. Accessed via www.extravasation.org, February 2011.


UK Oncology Nursing Society Anthracycline Extravasation Management Guidelines (2007)


Bendamustine SPC Mundipharma

Chapter 34 of The MASCC Textbook of Cancer Supportive Care and Survivorship. L Schulmeister 2011.

North Trent Extravasation Guidelines 2008

NHS Tayside Extravasation Policy for All Drugs, Chemotherapy and Non-Chemotherapy June 2008.
### 14. VERSION CONTROL SHEET

<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Author</th>
<th>Status</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>07/12</td>
<td>Lyn Williams – Accountable Pharmacist for Aseptics</td>
<td></td>
<td>Original date approval by DTC correct, director of Pharmacy retired resulting in delay.</td>
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APPELLIX 1 SUMMARY FLOW CHART

EXTRAVASATION

PERIPHERAL

CENTRAL LINE

STOP INFUSION

- Disconnect the infusion/ bolus.
- Leave cannula/ line in position
- Seek assistance from chemotherapy team
- ASPIRATE drug from the line or cannula, try to draw blood
- Mark around visible extravasated area with a pen
- Remove cannula. If CVC involve procedure team.
- Support the limb

INFORM THE DOCTOR

Follow individual drug management plan

LOCALISE & NEUTRALISE
Cold compress and antidote if indicated. See page 10.

DISPERSE & DILUTE
Warm compress and hyaluronidase. See page 14.

ADMINISTER PAIN RELIEF IF REQUIRED
COMPLETE ALL DOCUMENTATION
Management of extravasation Patient information leaflet

You have received your chemotherapy and a complication called EXTRAVASATION has occurred. Your chemotherapy has inadvertently passed out of the vein into the surrounding tissue.

The degree of extravasation injury depends on the type of chemotherapy drug you had administered. Your skin may have a mild reaction and become irritated, inflamed and tender or a severe reaction which could result in tissue necrosis. The important point is we have detected the extravasation and can now treat it.

Your chemotherapy nurse/doctor is a skilled and knowledgeable practitioner who will guide you through every detail of treatment and contact you on a regular basis to monitor your extravasation. Although it is very important you monitor the area each day to prevent further complications.

Daily area check:

- Is the area more painful?
- Has the area of inflammation increased?
- Is the area increased in redness or changed colour?
- Has any further stiffness of discomfort presented in your hand or arm?

If YES contact The Christie hotline on ……………………………………….

Daily assistance:

- Do not expose the area to direct sunlight
- Avoid wearing any tight clothing
- Take paracetamol if required
- Gently exercise the affected hand/arm
- Only apply the prescribed lotions/creams that the nurse/doctor has instructed.
- Protect the area when having a shower or bath

Follow up Appointments:

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
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<tbody>
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</tr>
</tbody>
</table>
APPENDIX 3 EXTRAVASATION DOCUMENTATION

Management of extravasation

Patient Name……………………………………
Hospital Number………………………………
Date of Birth……………………………………
Ward……………………………………………..
Consultant…………………………………………

Patient address…………………………………………………………………………………………
Patient contact number……………………………………………………………………………………

Extravasation Details
Date………………………………………………….. Time………………………………………..
Name of chemotherapy/drug…………………………………………………………………………
Regimen…………………………………………………………………………………………………
Bolus/Bag………………………………………………………………………………………………..
Approximate volume of extravasation (ml)……………………………………………………………

Patient's signs/symptoms

<table>
<thead>
<tr>
<th>Burning</th>
<th>Stinging</th>
<th>Pain</th>
<th>Discomfort</th>
<th>Inflammation</th>
<th>Swelling</th>
</tr>
</thead>
</table>

Other:

Burning
Stinging
Pain
Discomfort
Inflammation
Swelling
Initial Treatment details:

Cold Pack □ Heat Pack □

Antidote administered please give details:

..................................................................................................................................
..................................................................................................................................
..................................................................................................................................
..................................................................................................................................

Other prescribed medications (lotions, analgesic?) please give details:

..................................................................................................................................
..................................................................................................................................
..................................................................................................................................

Name of doctor informed.................................................................................................

Signature of chemotherapy nurse....................................................................................
Management of extravasation

Continuing assessment details:

<table>
<thead>
<tr>
<th>Day post extravasation</th>
<th>Skin Colour</th>
<th>Skin Temperature</th>
<th>Skin Integrity</th>
<th>Pain</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Oedema</th>
<th>Fever</th>
<th>Mobility</th>
<th>Nurse Initials</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Grading Scale:

<table>
<thead>
<tr>
<th>Scale</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin Colour</td>
<td>Normal</td>
<td>Pink</td>
<td>Red</td>
<td>Blackened</td>
<td></td>
</tr>
<tr>
<td>Skin Temperature</td>
<td>Normal</td>
<td>Warm</td>
<td>Hot</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skin Integrity</td>
<td>Normal</td>
<td>Blister</td>
<td>Skin Loss</td>
<td>Tissue loss</td>
<td>Expose bone/muscle with necrosis</td>
</tr>
<tr>
<td>Pain</td>
<td>Normal</td>
<td>tender</td>
<td>Sore to touch</td>
<td>Pain on resting</td>
<td>Pain on movement and analgesics required</td>
</tr>
<tr>
<td>Oedema</td>
<td>Normal</td>
<td>Non-pitting</td>
<td>Pitting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fever</td>
<td>Normal</td>
<td>Increased</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mobility</td>
<td>Normal</td>
<td>Slightly limited</td>
<td>Very limited</td>
<td>Immobile</td>
<td></td>
</tr>
</tbody>
</table>
Audit of compliance

The following standards will be audited in order to identify the effectiveness of the management of extravasation policy

- As a minimum, the audit was undertaken annually Y/N
- The audit was undertaken by members/a member of the Clinical Skills Team Y/N
- As a minimum, six extravasation incidents were reviewed Y/N
  (Where less than six incidents are available ALL reported incident will be reviewed)

Were the following standards met in all cases:-

- Based on the clinical expertise of the auditor were all incidents treated appropriately? Y/N
- Were all incidents clearly documented in the patient medical notes by the practitioner? Y/N
- Was there clear detail of action taken for all incidents? Y/N
- If clinically indicated, were follow up appointments made for all incidents? Y/N
- Was the incident reported as a clinical incident on the Trust Datix reporting system? Y/N
- If there were action plans were they monitored by the relevant committee? Y/N
- Were all incidents reported on an e-card at www.extravasation.org.uk/greencard.htm Y/N
  (This is a requirement for the national extravasation information service)
- Did the Chemotherapy Delivery Group received a monthly report on extravasation incidents Y/N

Completed by (sign) .................................................. Date..........................

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