Lothian NHS Board

Lothian NHS Board
Mainpoint
102 Westport
Edinburgh
EH3 9DN
Main Switchboard: 0131 242 100

www.nhslothian.scot

Date 08/04/2025
Your Ref
Our Ref 9857

Enquiries to Richard Mutch
Extension 35687
Direct Line 0131 465 5687
loth.freedomofinformation@nhs.scot
richard.mutch@nhs.scot

Dear

FREEDOM OF INFORMATION – EXTRAVASATION POLICY

I write in response to your request for information in relation to NHS Lothian's extravasation policy.

Question:

- I would be grateful if you could provide me with a hard copy of NHS Lothian's extravasation policy and procedure as in force on 5 March 2024

Answer:

Please see enclosed policy

I hope the information provided helps with your request.

If you are unhappy with our response to your request, you do have the right to request us to review it. Your request should be made within 40 working days of receipt of this letter, and we will reply within 20 working days of receipt. If our decision is unchanged following a review and you remain dissatisfied with this, you then have the right to make a formal complaint to the Scottish Information Commissioner within 6 months of receipt of our review response. You can do this by using the Scottish Information Commissioner's Office online appeals service at www.itspublicknowledge.info/Appeal. If you remain dissatisfied with the Commissioner's response you then have the option to appeal to the Court of Session on a point of law.

If you require a review of our decision to be carried out, please write to the FOI Reviewer at the email address at the head of this letter. The review will be undertaken by a Reviewer who was not involved in the original decision-making process.

Headquarters
Mainpoint
102 West Port
Edinburgh EH3 9DN

Chair Professor John Connaghan CBE
Chief Executive Professor Caroline Hiscox
Lothian NHS Board is the common name of Lothian Health Board

FOI responses (subject to redaction of personal information) may appear on NHS Lothian's Freedom of Information website at: https://org.nhslothian.scot/FOI/Pages/default.aspx

Yours sincerely

ALISON MACDONALD
Executive Director, Nursing
Cc: Chief Executive
Enc.

SECTION 6: EXTRAVASATION

Extravasation is the inappropriate or accidental administration of SACT or other irritant medication into the subcutaneous or sub-dermal tissues rather than into the intravenous compartment. The consequence of this action is often pain, erythema, inflammation and discomfort which, if left undiagnosed or inappropriately treated, can lead to necrosis and functional loss of the tissue and limb concerned.

Whilst extravasation is possible with any IV injection, it is only considered problematic with those compounds that are known to be vesicant or irritant.

6.1 RISK FACTORS ASSOCIATED WITH EXTRAVASATION

The following factors contribute to extravasation injury:

- Errors associated with the administration technique, such as device and technique.
- Factors associated with the patient, such as surgery, disease, venous access, and trauma.
- Factors associated with the drugs, such as the ability to bind directly to DNA, to kill replicating cells or to cause tissue or vascular dilatation, and the pH, osmolarity and excipients in the formulation of the drug.

6.1.1 PERIPHERAL EXTRAVASATION – PREVENTION AND MINIMISATION

The position, size and age of the cannulation site are the factors that have the greatest bearing on the likelihood of extravasation occurring.
The following points should also be borne in mind when administering SACT agents to reduce the possibility of extravasation:

- Assess both arms and hands of the patient (except where contra-indicated e.g. patients with breast cancer who have had axillary node clearance) prior to making a vein selection.
- Use heat to encourage vasodilation which eases the vein selection process and cannulation.
- Where a peripheral route must be used, this should be via a Teflon catheter, peripheral long line or newly sited 22 Gauge (blue) cannula. The size of cannula used will be dependent on assessment of the veins, type of SACT to be administered and the length of the infusion. A small adult cannula allows increased blood flow around the device thus increasing dilution of the agent and minimising the risk of mechanical phlebitis. However, if following clinical assessment it is deemed that a 24 (yellow) Gauge cannula is more appropriate, the rationale for its use must be clearly documented.
- Site the cannula in the forearm (NOT the antecubital fossa). If it is not possible to use the forearm, then use the dorsum of the hand. Avoid sites over joints such as the wrist. Secure the cannula with an occlusive dressing
- A single practitioner should never attempt to gain intravenous access more than twice. Another practitioner should then attempt to cannulate the patient but no more than six attempts should be made. At this stage another form of intravenous access should be considered e.g. skin tunnelled catheter, Portacath® or peripherally inserted central catheter (PICC).
- Where possible, try to avoid cannulation below a failed cannulation / venepuncture site as there is a theoretical risk of SACT infiltrating the previous puncture site.
- Wherever possible, administer bolus vesicants by a manual slow IV push into the side arm port or mechanical bolus infusion via an appropriate infusion device with a fast running IV infusion of compatible solution (with the exception of vinca alkaloids – refer to section 5.3). The most vesicant drug should be administered first because the integrity of the vein is greatest at this time.
- Slow infusions of vesicant drugs must only be given via a central vein.
- Infusion pumps used to administer vesicant drugs must have an in-built pressure sensor to detect increased resistance with an alarm to signal this.
- Wherever possible vesicant drugs should not be administered in concentrations higher than the manufacturer's recommendations.

- All infusion devices in RHSC now have nurse-adjustable pressures. These must be recorded hourly. Peripheral line pressures should not exceed 30mmHg. All intravenous SACT should be administered by medical or nursing staff who have received education and training in the administration of SACT.
- Educate the patient about the early signs and symptoms of possible peripheral extravasation in order that early detection and treatment can be achieved.
- Assess the site continually for signs of redness or swelling.
- Verify patency of the IV site prior to infusion checking for flow, any resistance, pain/swelling and flashback regularly throughout administration and between different drugs. If in any doubt, stop and investigate. Re-site the cannula if it is not satisfactory.
- NEVER hurry. Administer drugs slowly to allow the drug to be diluted by the carrier solution and to allow careful assessment of the site.
- Administer at a consistent rate to prevent surges in medication and pressure on the vein.

6.1.2 CENTRAL EXTRAVASATION - PREVENTION AND MINIMISATION

The patency of a central line should be checked on the day that it is to be used for administration of SACT by bleeding and flushing the line following local policy for the management of central vascular access devices. If a line will not bleed or if there is any doubt concerning the positioning of the line (e.g. history of line trauma), under NO circumstances should it be used until appropriate screening has been conducted to ensure its correct placement and patency.

Educate the patient about the early signs and symptoms of possible central extravasation in order that early detection and treatment can be started.

Infusion pumps used to administer SACT must have an in-built pressure sensor to detect increased resistance with an alarm to signal this.

Wherever possible, vesicant drugs should not be administered at concentrations higher than the manufacturer's recommendations.

All infusion devices in RHSCYP (except Baxter's pumps) now have nurse-adjustable pressures. These must be recorded hourly. Central line pressures should not exceed 50mmHg. All intravenous SACT should be administered by medical or nursing staff who are educated and trained in the administration of SACT.

6.2 EXTRAVASATION SIGNS AND SYMPTOMS

6.2.1 PERIPHERAL EXTRAVASATION – SIGNS AND SYMPTOMS

When administering SACT always be aware of and observe for any of the following signs and symptoms that could indicate that a peripheral extravasation has occurred:

- The patient complains of burning, stinging or any other acute change around the infusion site.
- There is swelling, leakage or induration around the infusion site.
- There is redness or blanching of tissue at the site.
- The infusion refuses to flow freely or resistance is felt when attempting to give drugs by bolus or injection.
- Large volume extravasations are > 5ml, size of area of 2 pence coin or larger

6.2.2 CENTRAL EXTRAVASATION – SIGNS AND SYMPTOMS

When administering SACT you should always be aware of and observe for any of the following signs and symptoms that could indicate that a central extravasation has occurred:

- Leakage at the entry site or centrally.
- Swelling of chest wall.
- Patient complains of aching/discomfort in the shoulder and neck.
- Patient complains of pain, breathlessness, dizziness.
- The infusion refuses to flow freely or resistance is felt when attempting to give drugs by bolus or injection.
- Large volume extravasation are > 5ml, size of area of 2 pence coin or larger

N.B. Observation of small children, infants and patients unable to communicate (e.g. sedated, anaesthetised patients, those with communication difficulties) is vitally important as they are less able / unable to report symptoms.

6.3 EXTRAVASATION GENERAL TREATMENT INSTRUCTIONS

6.3.1 PERIPHERAL EXTRAVASATION – GENERAL TREATMENT INSTRUCTIONS

Suspected/actual extravasation.

↓

STOP infusion immediately and call for assistance.

Contact doctor/ANP or ask someone to do this for you.

Get extravasation kit or ask someone to collect this for you.

Apply personal protective equipment.

↓

Disconnect infusion, **DO NOT remove cannula**.

↓

Aspirate extravasated drug & blood if possible.

↓

Mark around affected area (with permanent pen)

↓

Remove cannula.

↓

Treat affected area following guidance from within this booklet for specific drug

↓

If vesicant drug, discuss with plastic surgeon asap, aiming for review within 6 hours.

↓

ELEVATE LIMB

DOCUMENT incident in:

1. Patient Notes – TRAK clinical notes and Chemocare.
2. Start Extravasation Report Form – ensure available for reviews in following days
3. Give patient information leaflet.
4. Complete GP information letter.
5. Incident Form (DATIX).

↓

Replace extravasation kit.

(During working hours obtain from pharmacy, out-of-hours obtain from emergency cupboard)

↓

1. If extravasation of vesicant or exfoliant drug, **inform patient's Consultant** – to include discussion around benefits vs risk of continuing planned SACT
2. **Arrange review for extravasation area as per Report Form** - see Follow-Up (Page 14)

6.3.2 CENTRAL EXTRAVASATION – GENERAL TREATMENT INSTRUCTIONS

Suspected/actual extravasation.

↓

STOP infusion immediately and call for assistance.
Contact doctor/ANP or ask someone to do this for you.
Get extravasation kit or ask someone to collect this for you.
Apply personal protective equipment.

↓

Disconnect infusion

↓

Aspirate extravasated drug and blood if possible
adhering to Aseptic Non-touch Technique.

↓

Mark affected area (with permanent pen)

↓

DO NOT FLUSH THE LINE

↓

Seek Doctor/ANP review and decision to either immediately pull line or perform appropriate screening to rule out cardiac toxicity, pneumonia, pleural effusion, central line thrombus.

↓

If vesicant or exfoliant drug, refer to plastic surgeons to be reviewed within 6 hours.

↓

Treat affected area, as appropriate, following guidance from within this booklet for the specific drug.

↓

Obtain peripheral access if needed to administer any symptomatic therapies.

DOCUMENT incident in:

1. Patient Notes – TRAK clinical notes and Chemocare.
2. Start Extravasation Report Form – ensure available for reviews in following days
3. Give patient information leaflet.
4. Complete GP information letter.
5. Incident Form (DATIX).

↓

Replace extravasation kit.
(During working hours obtain from pharmacy, out–of-hours obtain from emergency cupboard)

↓

1. If extravasation of vesicant or exfoliant drug, **inform patient's Consultant** – to include discussion around benefits vs risk of continuing planned SACT
2. **Arrange review for extravasation area as per Report Form** - see Follow-Up (Page 14)

6.3.3 NON PHARMACOLOGICAL MANAGEMENT OF EXTRAVASATION

Heat and cold sources should not be applied directly to the skin. A piece of dry gauze should be placed as a protective barrier between the skin and heat / cold source.

Heat application

Application of heat causes vasodilation, increases drug distribution and absorption and decreases local drug concentrations. It aids the dispersal of vinca-alkaloids and other non-vesicant induced injuries where "spread and dilute" treatment is required. Heat should never be used for doxorubicin-induced injury. This increases the cellular uptake of doxorubicin, increasing cytotoxicity. Where heat is advocated, it is recommended to use a heat pack on the extravasated area for 20 minutes every 6 hours.

Topical cooling

Topical cooling diminishes pain and discomfort at the extravasation site and causes vasoconstriction, localising the extravasated vesicant and allowing time for the agent to be dispersed by local vascular and lymphatic systems. Decreasing the blood supply decreases the metabolic demand of the affected and at risk tissue slowing drug uptake. It also changes the fluidity of the cellular membrane making the cells less sensitive to the damaging effects of doxorubicin. This approach should not be used for vinca-alkaloid induced injuries as it is shown to increase ulcer formation. Where cooling is advocated, it is recommended to use a cold pack on the extravasated area for 30 minutes every 4 hours.

Surgery

Surgical intervention is critical in extravasations of DNA-binding vesicant drugs, especially if >5ml (e.g. larger than a 2 pence coin) volume extravasated. DNA-binding vesicants cause latent damage, so the skin may look normal in the hours to days after extravasation. It is important that early referral is made, such that Plastics Review and Saline Flushout can be carried out within 6 hours of the extravasation (24 hours maximum). Surgical intervention is typically a Saline Flushout and involves administration of local anaesthetic, followed by stab incisions into the tissue at the site of the extravasation, coupled with copious flushing out of the tissues, with 0.9% Saline solution. This is generally carried out by a plastic surgeon or an appropriately trained clinician.

Any extravasation discovered beyond the 24 hour flushing out window will not benefit from having this procedure done. They should remain under the review procedure of delayed extravasations, and should be discussed with the Plastic Surgical Team if any concerns around "fixed staining" (non-blanching erythema) or persistently blanched areas, or necrosis or ulceration developing.

DNA binding vesicants are listed as below:

- Anthracyclines- Epirubicin, Daunorubicin, Doxorubicin, Idarubicin
- Vinca alkaloids- Vincristine, Vinblastine, Vinorelbine, Vindedsine, Vinflunine
- Others- Mitomycin, Streptozin, Amsacrine, Carmustine, Dacarbazine, Dactinomycin, Mechlorethamine

Please also consider non-cytotoxic vesicant and irritant drugs and their potential for considerable harm. This includes the following hyperosmolaric drugs:

- Calcium Chloride, Calcium Gluconate, Glucose >10%, Magnesium Sulphate 20%, Mannitol 10%, Mannitol 20%, TPN, Potassium Chloride, Sodium Bicarbonate, Sodium Chloride >0.9% and X-ray contrast media.
- This is not an exhaustive list and the NHS Lothian Infusional Medicines Guidelines should always be checked.

6.3.4 METHOD OF USE OF ANTIDOTES AND TREATMENTS

Hyaluronidase

Definition: An enzyme responsible for degrading hyaluronic acid and by this mechanism enhances the systemic uptake of the infiltrated cytotoxic. It is unlikely to cause harm to surrounding tissue. Its use in extravasation injuries is off-label.

Indications: It is routinely used with vinca-alkaloids and its use has been advocated with other agents such as paclitaxel.

Method of use: Dilute 1500 units of hyaluronidase in 2ml of water for injection or 0.9% sodium chloride. Give as 0.2ml subcutaneous injections over and around the circumference of the affected area. Gently massage area to facilitate dispersal.

Dimethylsulfoxide (DMSO)

Definition: A product that enhances skin permeability thus facilitating the systemic absorption of the vesicant drug. It has also free radical scavenging properties. The optimal scheduling and duration for the use of DMSO is unclear and recommendations
have been based on the ESMO-EONS clinical practice guidelines for chemotherapy extravasation. DMSO products are unlicensed.

Indications: Topical DMSO has been shown in prospective studies to limit the course of anthracycline extravasation injuries.

Method of use: Apply topically, painting on with a cotton bud 4 times a day for 5-7 days. Do not cover until area is dry as this may cause blistering.

6.4 DRUG CLASSIFICATION TABLE

Definitions:

Vesicants: Capable of causing pain, inflammation and blistering of the local skin, underlying flesh and structures, leading to tissue death and necrosis.
Exfoliants: Capable of causing inflammation and shedding of the skin, but less likely to cause tissue death.
Irritants: Capable of causing inflammation and irritation, rarely proceeding to breakdown of the tissue.
Inflammitants: Capable of causing mild to moderate inflammation and flare in local tissue.
Neutral: Ostensibly inert or neutral compounds that do not cause inflammation or damage.

The drugs within the classification table are colour coded red, blue or black:

Red indicates that heat should be used to treat the area
Blue indicates that cold should be used to treat the area
Drugs not given a colour utilise both heat and cold to treat the area

DRUG	Group	Classification	Page

Alemtuzumab	5	Neutral	13
Amsacrine	1	**Vesicant**	9
Arsenic Trioxide	3	Irritant	12
Asparaginase	5	Neutral	13
Bendamustine	3	Irritant	12
Bevacizumab	5	Neutral	13
Bleomycin	5	Neutral	13
Blinatumomab	5	Neutral	13
Bortezomib	4	Inflammitant	12
Brentuximab	5	Neutral	13
Busulfan	1	**Vesicant**	10
Cabazitaxel	2	Exfoliant	10
Carboplatin	3	Irritant	12
Carfilzomib	5	Neutral	13
Carmustine	1	**Vesicant**	10
Cetuximab	5	Neutral	13
Cisplatin	2	Exfoliant	10
Cladribine	5	Neutral	13
Clofarabine	5	Neutral	13
Chlormethine (mustine)	1	**Vesicant**	9
Crisantaspase	5	Neutral	13
Cyclophosphamide	5	Neutral	13
Cytarabine	5	Neutral	13
Dacarbazine	2	Exfoliant	11
Dactinomycin	1	**Vesicant**	9
Daunorubicin	1	**Vesicant**	9
Daunorubicin Liposomal	2	Exfoliant	11
Decitabine	5	Neutral	13
Docetaxel	2	Exfoliant	10
Doxorubicin	1	**Vesicant** **NEVER USE HEAT**	9
Doxorubicin Liposomal	2	Exfoliant **NEVER USE HEAT**	11
Epirubicin	1	**Vesicant**	9
Eribulin	5	Neutral	13
Etoposide	3	Irritant	12
Fludarabine	5	Neutral	13
5- Fluorouracil	4	Inflammitant	12
Gemcitabine	5	Neutral	13
Gemtuzumab	3	Irritant	12
Idarubicin	1	**Vesicant**	9
Ifosfamide	5	Neutral	13
Inotuzumab ozagamicin	5	Neutral	13
Ipilimumab	5	Neutral	13
Irinotecan	3	Irritant	12
Isatuximab	5	Neutral	13
Melphalan	1*	**Vesicant**	10
Methotrexate	4	Inflammitant	12
Mifamurtide	5	Neutral	13
Mitomycin C	1	**Vesicant**	9
Mitoxantrone	2	Exfoliant	11
Mogamulizumab	5	Neutral	13
Nelarabine	5	Neutral	13
Nivolumab	5	Neutral	13

Obinutuzumab	5	Neutral	13
Ofatumumab	5	Neutral	13
Oxaliplatin	2	Exfoliant	10
Paclitaxel	2	Exfoliant	10
Paclitaxel albumin	2	Exfoliant	10
Panitumumab	5	Neutral	13
Pegasparaginase	5	Neutral	13
Pemetrexed	5	Neutral	13
Pembrolizumab	5	Neutral	13
Pertuzumab	5	Neutral	13
Pentostatin	5	Neutral	13
Pixatrone	5	Neutral	13
Raltitrexed	4	Inflammitant	12
Ramucirumab	5	Neutral	13
Rituximab	5	Neutral	13
Sacituzumab Govetican	5	Neutral	13
Siltuximab	5	Neutral	13
Streptozocin	1	**Vesicant**	9
Temsirolimus	3	Irritant	12
Thiotepa	5	Neutral	13
Topotecan	2	Exfoliant	11
Trabectedin	1	**Vesicant**	10
Trastuzumab	5	Neutral	13
Trastuzumab emtansine	3	Irritant	12
Treosulfan	1	**Vesicant**	10
Vinblastine	1	**Vesicant**	9
Vincristine	1	**Vesicant**	9
Vindesine	1	**Vesicant**	9
Vinflunine	1	**Vesicant**	9
Vinorelbine	1	**Vesicant**	9

* For the purposes of this policy, melphalan, although classed as a neutral drug in literature should be treated as a vesicant and only administered centrally as an infusion. This decision is based on local experience.

6.5 SPECIFIC DRUG MANAGEMENT GUIDELINES

6.5.1 CLASSIFICATION GROUP 1: VESICANT DRUGS

These instructions apply to the following vesicant drugs:

Amsacrine	**Daunorubicin**	**Idarubicin**
Chlormethine (mustine)	**Doxorubicin**	**Mitomycin**
Dactinomycin	**Epirubicin**	**Streptozocin**

1. Follow general treatment instructions.
2. Firmly apply a cold pack to the extravasated area for 30 minutes every 4 hours for the first 24 hours. NEVER use Heat on Doxorubicin extravasations.
3. **Refer urgently to Plastic Surgical Team** for saline flushout of extravasation area (see page 5). This procedure is time critical – within 6 hours of extravasation, max 24hours.
4. Alternate topical DMSO and 1% hydrocortisone cream every 2 hours in the first 24 hours then every 3 hours for the next 7-10 days.
5. Arrange Face-to-Face review on days 2, 4, 8 and 11 post-extravasation (Day 1 is the day of extravasation or presentation of symptoms of a delayed extravasation).

These instructions apply to the following vesicant drugs:

Vinblastine	**Vincristine**	**Vindesine**	**Vinflunine**	**Vinorelbine**

1. Follow general treatment instructions.
2. Firmly apply a heat pack to the extravasated area for 20 minutes every 6 hours for the first 24 hours.
3. Dispersal of the drug can be facilitated by the use of subcutaneous hyaluronidase. Dilute 1500 units of hyaluronidase in 2ml of water for injection or 0.9% sodium chloride. Give as 0.2ml subcutaneous injections over and around the circumference of the affected area. Gently massage area to facilitate dispersal. Apply heat and compression to assist natural dispersal of the drug. Plastics Team may administer Hyalouronidase as part of saline flushout, so do not delay transfer for Hyalouronidase administration.
4. **Refer urgently to Plastic Surgical Team** for saline flushout of extravasation area (see page 5). This procedure is time critical – within 6 hours of extravasation, max 24hours.
5. Arrange Face-to-Face review on days 2, 4, 8 and 11 post-extravasation (Day 1 is the day of extravasation or presentation of symptoms of a delayed extravasation).

These instructions apply to the following vesicant drugs:

Busulfan	**Carmustine**	**Melphalan**	**Trabectedin**	**Treosulfan**

1. Follow general treatment instructions.

2. Firmly apply a cold pack to the extravasated area for 30 minutes every 4 hours for the first 24 hours.
3. **Refer urgently to Plastic Surgical Team** for saline flushout of extravasation area (see page 5). This procedure is time critical – within 6 hours of extravasation, max 24hours.
4. Apply topical 1% hydrocortisone cream every 6 hours for up to 7 days or as long as erythema continues.
5. Arrange Face-to-Face review on days 2, 4, 8 and 11 post-extravasation (Day 1 is the day of extravasation or presentation of symptoms of a delayed extravasation).

6.5.2 CLASSIFICATION GROUP 2: EXFOLIANT DRUGS

These instructions apply to the following exfoliant drugs:

Cisplatin	Cabazitaxel	Docetaxel	Oxaliplatin	Paclitaxel
Paclitaxel albumin				

1. Follow general treatment instructions.
2. Firmly apply a heat pack to the extravasated area for 20 minutes every 6 hours for the first 24 hours.
3. Apply topical hydrocortisone cream 1% every 6 hours for 7 days or as long as erythema continues.
4. In large volume extravasations where the patient is experiencing discomfort due to swelling, dispersal of the drug can be facilitated by the use of subcutaneous hyaluronidase. Dilute 1500 units of hyaluronidase in 2ml of water for injection or 0.9% sodium chloride. Give as 0.2ml subcutaneous injections over and around the circumference of the affected area. Gently massage area to facilitate dispersal. Apply heat and compression to assist natural dispersal of the drug.
5. Arrange Face-to-Face review on days 2, 4, 8 and 11 post-extravasation (Day 1 is the day of extravasation or presentation of symptoms of a delayed extravasation).

These instructions apply to the following exfoliant drug:

Topotecan

1. Follow general treatment instructions.
2. Firmly apply a cold pack to the extravasated area for 30 minutes every 4 hours for the first 24 hours.
3. Apply topical hydrocortisone cream 1% every 6 hours for 7 days or as long as erythema continues.
4. In large volume extravasations where the patient is experiencing discomfort due to swelling, dispersal of the drug can be facilitated by the use of subcutaneous hyaluronidase (1500 units in 2ml water for injection) injected around the area of injury. Gently massage the area to facilitate dispersal.

5. Arrange Face-to-Face review on days 2, 4, 8 and 11 post-extravasation (Day 1 is the day of extravasation or presentation of symptoms of a delayed extravasation).

These instructions apply to the following exfoliant drugs:

Daunorubicin (liposomal)	Doxorubicin (liposomal)

1. Follow general treatment instructions.
2. Firmly apply a cold pack to the extravasated area for 30 minutes every 4 hours for the first 24 hours.
3. Alternate topical DMSO and 1% hydrocortisone cream every 2 hours in the first 24 hours, starting 8 hours after the extravasation, and then four times daily thereafter for up to 14 days.
4. Arrange Face-to-Face review on days 2, 4, 8 and 11 post-extravasation (Day 1 is the day of extravasation or presentation of symptoms of a delayed extravasation).

These instructions apply to the following exfoliant drugs:

Dacarbazine	Mitoxantrone

1. Follow general treatment instructions.
2. Firmly apply a cold pack to the extravasated area for 30 minutes every 4 hours for the first 24 hours.
3. Alternate topical DMSO and 1% Hydrocortisone cream every 3 hours for 5 to 7 days.
4. Arrange Face-to-Face review on days 2, 4, 8 and 11 post-extravasation (Day 1 is the day of extravasation or presentation of symptoms of a delayed extravasation).

6.5.3 CLASSIFICATION GROUP 3: IRRITANT DRUGS

These instructions apply to the following irritant drugs:

Arsenic Trioxide	Bendamustine	Carboplatin	Etoposide	Gemtuzumab
Irinotecan	Temsirolimus	Trastuzumab emtansine		

1. Follow general treatment instructions.
2. Firmly apply a cold pack to the extravasated area for 30 minutes every 4 hours for the first 24 hours.
3. Apply topical hydrocortisone cream 1% every 6 hours for up to 7 days or as long as erythema continues.
4. Telephone assessment to be arranged days 2, 4, 8 and 11 post-extravasation (Day 1 is the day of extravasation or presentation of symptoms of a delayed extravasation).

6.5.4 CLASSIFICATION GROUP 4: INFLAMMITANT DRUGS

These instructions apply to the following inflammitant drugs:

Bortezomib	**Fluorouracil**	**Methotrexate**	**Raltitrexed**	**Trabectedin**

1. Follow general treatment instructions.
2. Firmly apply a cold pack to the extravasated area for 30 minutes every 4 hours for the first 24 hours.
3. When the initial inflammatory reaction has subsided, a warm compression may be used to aid the dispersal of any residual fluid.
4. Apply topical hydrocortisone cream 1% every 6 hours for up to 7 days or as long as erythema continues.
5. Telephone assessment to be arranged days 2, 4, 8 and 11 post-extravasation (Day 1 is the day of extravasation or presentation of symptoms of a delayed extravasation).

6.5.5 CLASSIFICATION GROUP 5: NEUTRAL DRUGS

These instructions apply to the following neutral drugs:

Alemtuzumab	**Decitabine**	**Ofatumumab**
Asparaginase	**Eribulin**	**Pegasparaginase**
Bevacizumab	**Fludarabine**	**Pembrolizumab**
Bleomycin	**Gemcitabine**	**Pemetrexed**
Blinatumomab	**Ifosfamide**	**Pentostatin**
Brentuximab	**Inotuzumab ozogamicin**	**Pertuzumab**
Carfilzomib	**Ipilimumab**	**Pixatrone**
	Isatuximab	**Ramucirumab**
Cetuximab	**Mogamulizumab**	**Rituximab**
Cladribine	**Nelarabine**	**Sacituzumab Govetican**
Clofarabine	**Obinatuzumab**	**Siltuximab**
Crisantaspase	**Nivolumab**	**Thiotepa**
Cyclophosphamide	**Mifamurtide**	**Trastuzumab**
Cytarabine	**Panitumumab**	

1. Follow general treatment instructions.

2. Firmly apply a heat pack to the extravasated area for 20 minutes every 6 hours for the first 24 hours.

In large volume extravasations where the patient is experiencing discomfort due to swelling, the following may be considered:

3. Dispersal of the drug can be facilitated by the use of subcutaneous hyaluronidase. Dilute 1500 units of hyaluronidase in 2ml of water for injection or 0.9% sodium chloride. Give as 0.2ml subcutaneous injections over and around the circumference of the affected area. Gently massage area to facilitate dispersal.

4. Apply heat and compression to assist natural dispersal of the drug.

5. Telephone assessment to be arranged days 2, 4, 8 and 11 post-extravasation (Day 1 is the day of extravasation or presentation of symptoms of a delayed extravasation).

6.6 EXTRAVASATION GENERAL INFORMATION

1. Datix every extravasation, even if no immediate clinical concern. If this involves a vesicant drug then please highlight this.
2. If the drug involved in the extravasation is a vesicant, then discuss with plastic surgery at the earliest opportunity (ideally within 6 hours and has to be within 24 hours) so that a flush-out can be considered.
3. After vesicant extravasation, patients should be reviewed by their/a consultant for assessment and for discussion of the risks and benefits of proceeding to further chemotherapy.
4. If a patient is under review for longer than 10 days due to ongoing clinical concern, if the patient presents again after 10 days, or if the patient requires referral to plastics at any point, then please submit a(nother) Datix. Include the patient's name, drug and date of suspected extravasation so that it can be linked to the original Datix.
5. Inform the patient's consultant again if subsequent delayed tissue damage is suspected from a vesicant (or exfoliant) extravasation.
6. Document all reviews, discussion with patient and decisions to treat clearly in the notes in Trak and Chemocare and update the Datix where indicated.

6.7 FOLLOW UP AFTER EXTRAVASATIONS

Extravasations are very time sensitive when getting treatment instigated but also for the follow up procedures. Typically, extravasations are reviewed on Days 2, 4, 8 and 11, using the Extravasation Report Form for documentation. These are Face-to-Face reviews for vesicants and exfoliants, and telephone reviews for irritants, inflammitants and neutrals.

When organising follow-up reviews, the days are defined as follows:

- An extravasation that is noted on the day of treatment is defined as occurring on day 1. Therefore, the follow up should be organised on that basis.
- For a delayed extravasation, day 1 is the day of presenting symptom and follow up should be arranged on that basis.

Vesicants can cause progressive tissue damage many weeks after the extravasation incident which might initially be hard to differentiate from infection.

Of note, necrotic or ulcerated areas should be referred to Plastic Surgical Team for review.

If the extravasation area has signs of “fixed staining” (non-blanching erythema) or persistently blanching, this suggests the area is at risk of breakdown. These patients should stay under regular review beyond Day 10 – frequency of review depends on the severity (decided by clinician) – until fixed staining/blanching improves.

Once the report form is completed it should be scanned into SCI Store on the patient’s TRAK record in order to be immediately accessible to all members of the treating MDT.

If photography is required, then the camera is kept in the Cancer Assessment Unit WGH.

6.8 CONTACT NUMBERS FOR SURGICAL ADVICE/ INTERVENTION:

Edinburgh Cancer Centre (WGH and SJH):

Contact the on-call Plastic Surgery registrar at SJH via switchboard or bleep Plastic Surgery SHO on 3702

Borders:

Contact the on-call General Surgeon via switchboard or bleep 6007 (for surgical flush out)

Contact the on-call Plastic Surgery registrar at SJH via switchboard (for advice).

Dumfries and Galloway:

Contact the on-call Plastic Surgery registrar at SJH via switchboard

Fife:

Contact the on-call Plastic Surgery registrar at Dundee via switchboard

6.9 TRIAL/STUDY SPECIFIC NOTE ON EXTRAVASATION

The administration of novel agents should be carried out by trials team members. For trials that do not involve standard drugs, but a novel (or new) agent being given very early in its development there will be some information regarding its chemical composition and anticipated extravasation damage potential in the accompanying trial-specific protocol or investigator brochure (IB).

If there is no specific information and extravasation is suspected, follow the standard extravasation practice as above and liaise with the trials team for specialist treatment options/advice prior to application of heat/cold or antidotes.

Protocols and IBs for individual trials are held in the appropriate trials team office and are kept on EDGE. Out-of-hours copies of protocols can be accessed via EDGE or via the trial protocol filing cabinet outside the oncology seminar room (bleep 8106 holds the key). The Principal Investigator (PI) in the WGH for each trial will usually be noted in the protocol and in the Trials Alert Sheet in the patient’s oncology

notes. They will be contactable via switchboard. The co-investigator will also be listed in the protocol and Trials Alert Sheet if the Principal Investigator is not available.

See Appendix 7 for Extravasation Report Form

SECTION 7: SUPPORTIVE CARE DURING TREATMENT

Supportive care guidelines for the management of cancer and SACT related complications in adult oncology are available on OOQS, for haematology patients on the haematology intranet, and for paediatric patients are available on the NHS Lothian intranet.

Patient/care pathways for the management of complications of SACT are approved by local clinical governance groups and are accessible to all relevant staff across the NHS Board area. This may include staff in NHS 24 Centres, NHS Board Out-of-Hours Centres, Emergency Care Centres and Acute Admission Units.

The pathways include:

- patient/carer information on what they should do in the event of developing a complication including when, who and how to contact relevant services.
- signposts to guidelines and protocols for supportive treatment and SACT toxicity management
- patient Alert Cards advising of the signs and symptoms of neutropenic sepsis, details about how to access timely advice (24 hours a day, every day) from an appropriate specialist and details of treat and transfer arrangements, if appropriate.
- arrangements for communication with, and timely review by, an appropriate specialist.

Within NHS Lothian individualised arrangements are in place to manage oncology, haematology and paediatric patients and the relevant policy documents should be referred to for the most up to date information whether via the intranet in the case of adult services, or by accessing paediatric policies via local arrangements.