

Guidelines for prevention and management of CHEMOTHERAPY EXTRAVASATION

Please note that this policy refers to the management of extravasation of cytotoxic chemotherapy only.
Refer to local Trust policies for management of non-cytotoxic extravasation.

Definitions

Extravasation is the inadvertent leakage of intravenous drugs out of the vein into surrounding tissues.

Extravasation injury refers to the damage caused by the leakage of solutions from the vein into the surrounding tissue spaces. Depending on the substance that is extravasated into the tissue, the degree of injury can range from a very mild skin reaction to severe necrosis.

The term **Infiltration** is sometimes used instead of extravasation to refer to the inadvertent administration of non-vesicant solution/medication into surrounding tissues. Whilst the medication itself cannot damage the tissues, if the volume of fluid is large, the swelling can result of compression of the nerve. Therefore the site must be observed and the degree of swelling documented. The patient should be questioned regarding any numbness or loss of sensation in the affected limb and this should be reported accordingly.

Flare is a localised inflammatory reaction characterised by a localised erythema, venous streaking and pruritus along the injected vein. This is distinguishable from extravasation by the absence of pain and swelling and may include the presence of a blood return.

Classification of Chemotherapy Agents

Cytotoxic drugs may be classified according to their potential to cause serious necrosis when extravasated (see Appendix A).

Extravasation of vesicants is a medical emergency; early detection and prompt appropriate action is required to prevent necrosis and functional loss of the tissue or limb involved.

Prevention of Extravasation

Forethought, planning and improved prevention measures can minimise the risk of extravasation.

- i) Careful assessment of the most appropriate cannulation site should be undertaken before insertion. Siting the cannula over joints should be avoided, as tissue damage in these areas has serious consequences. If venous access proves difficult, the opinion of an experienced practitioner should be sought as placement of a central venous access device (CVAD) may be necessary.
- ii) Extravasation can occur in CVADs, often with delayed onset, and can be recognised by the patient complaining of sudden pain, discomfort, inflammation or swelling around the extravasation site.

Reason for Update: additional information added regarding management of extravasation from a central line	Approved by Chair of Alliance Chemotherapy Nurses: pp. Paula Deery
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- iii) Some patient groups are at increased risk of extravasation. These include obese, elderly, paediatric patients, thrombocytopenic patients, diabetics with peripheral neuropathy and patients who have had previous chemotherapy / radiotherapy. Non-English speaking patients and those with communication difficulties are also at risk. Extra care should be taken with all these patient groups.
- iv) Wherever possible, ensure the patient is aware and educated with regards to taking as much care as possible not to dislodge the cannula / needle, particularly when moving around (e.g. on a trip to the toilet) and also to alert staff as soon as they feel any burning, stinging or pain in the area of the injection site.
- v) Vesicant drugs in a chemotherapy regimen must be given before the other cytotoxic agents.
- vi) When given peripherally, bolus doses (*in syringes*) of vesicants must be given via a fast running infusion of a compatible fluid. Continually assess the cannulation site throughout the administration for signs of swelling, pain or inflammation, and monitor the fast running infusion for change in rate.
- vii) Only the following vesicant cytotoxics may be given by peripheral infusion (*in bags*): paclitaxel, vinca alkaloids, dacarbazine, streptozocin. However, the central venous route minimises the extravasation risk, and should be considered on an individual patient basis. Any other cytotoxic vesicant infusions (*in bags*) should be administered via a CVAD.
- viii) Anthracycline administration must be carried out during normal working hours except in situations of life threatening urgency, in which case direct Consultant authorisation is required and the reasons recorded in the medical notes, as well as subsequent routine review of such episodes by the local chemotherapy group.
 - All out-patient and day case appointments for anthracycline administration should be scheduled for the morning or early afternoon, so that all management options can be considered in the event of an anthracycline extravasation.
 - All pre-planned out-of-hours anthracycline administration for AML should be delivered via a central venous access device, again except for exceptional situations when direct Consultant authorisation is required and reasons documented.

Management of Extravasation of Cytotoxic Drugs

Signs and Symptoms

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 some drugs.
- Observation of swelling or induration at the device insertion site or along the tunnel/around port pocket or into the shoulder and neck on the side of the port or catheter OR redness or blistering at the device insertion site. This should be distinguished from the 'nettle rash' effect seen with anthracyclines.
- No blood return is obtained. This is not a sign of extravasation if found in isolation.
- A resistance is felt on the plunger of the syringe of a bolus drug.
- There is absence of free flow of the infusion.
- If in *any doubt*, treat as extravasation.

If an extravasation is suspected, take immediate action as documented in the algorithm below:

- Stop the injection/infusion. Disconnect the intravenous tubing.
- Withdraw as much of the drug as possible, via existing cannula or central venous access device (CVAD).
- Mark area of skin with indelible pen. Take a photograph of the area as soon as possible. (Cameras are often available from Accident & Emergency departments)
- If appropriate, remove the peripheral cannula (see Note 1 below for advice for CVADs).
- Open extravasation kit (see Appendix B for list of contents).
- Refer to Appendix C to establish: whether a hot pack or cold pack should be used, or whether neither is required; and what further treatment is recommended. Follow guidance in flow chart below accordingly.
- Note that for Neutral drugs, neither a cold pack nor a hot pack is required. Aspirate as much fluid as possible, and then remove the peripheral cannula. No further treatment should be required. Manage the situation symptomatically. Document the incident in the patient's notes.

CYTOTOXICS REQUIRING WARM PACK

- Inject 1500 iu hyaluronidase (in 1ml WFI) via pincushion s/c injections in 0.1 – 0.2ml volumes around the site
- Apply a warm pack to aid absorption of hyaluronidase
- Warm pack to remain in situ for 2-4 hours

CYTOTOXICS REQUIRING COLD PACK

See Appendix C for specific onward management, EITHER:

- **Cold pack + hydrocortisone cream**

Apply cold pack for 15-20 minutes 3-4 times a day for up to 3 days.

Apply hydrocortisone 1% cream tds, as long as redness persists.
Once opened, cream must be labelled with patient details.

OR

- **Cold pack + DMSO** (see Note 2 below for details)

OR

- **Consider Savene (dexrazoxane)**

If extravasation of doxorubicin, epirubicin, idarubicin or daunorubicin occurs (5ml or more peripherally or any volume via a CVAD) then stop cold pack, do not apply DMSO and consider use of dexrazoxane (see Note 4 below)

ELEVATE THE LIMB
on a pillow

INFORM THE MEDICAL STAFF
Consider urgent referral to plastic surgeon for saline flush-out (See Note 3 below)

Document the incident by completing trust incident form and extravasation record form.
File copies in patient's health record.

GIVE PATIENT THE PATIENT INFORMATION SHEET and follow up appointments as indicated (see Subsequent Action below)

Subsequent action

- Encourage gentle movement of the affected limb.
- Patient follow up arrangements will be dependent upon the type of drug and volume that extravasated, and will be decided by a practitioner who has experience of extravasation management.
- Extravasation of vesicant and exfoliant drugs requires completion of the Follow up Flow Chart in Appendix D.
- Consider prescription of analgesia as required.

Notes

Note 1: Advice for CVADs, including PICC lines, skin-tunnelled catheters and implanted ports

- If an extravasation occurs via a CVAD, it should remain in place until contact has been made with both the Consultant responsible for care and Consultant Radiologist.
- Initial management should be application of cold pack to the affected area.
- Consider administration of the appropriate antidote, if thought to be beneficial (plus switch from cold pack to a warm pack if hyaluronidase is used). Use of antidote will be dependent on the location and volume / type of drug that has extravasated. **N.B.** Administration of an antidote before a washout procedure may not be helpful and may delay the urgent transfer.
- A chest x-ray should be taken to confirm where the tip of the catheter lies.
- A lineogram should be undertaken to ensure there is no fracture in the catheter - liaise with the patient's oncologist/haematologist and Consultant Radiologist.
- If the patient is to be transferred for a washout procedure, all CVCs, including PICCs, should remain in place until assessed by the Specialist Plastics team.
- Once the information from these investigations are completed and a diagnosis can be made, consider:
 - Urgent referral to Plastics team at designated site (see below for contact details), to consider a washout procedure and removal of PICC, skin tunnelled catheter / implanted port.
- OR
 - If washout procedure will not be required, PICCs may be removed by an appropriately trained nurse whilst Skin Tunnelled catheters and Implanted Ported devices may be removed by Consultant Radiologist

Note 2: Use of 98% dimethyl sulfoxide (DMSO)

- DMSO should be applied within 10 – 25 minutes of the extravasation occurring.
- Draw around area of extravasation with indelible pen. Then, a thin layer of 98% DMSO solution should be applied topically to the extravasated area using the applicator provided. Contact with good skin should be minimised, as there are some reports associating DMSO with blistering of the skin. Once DMSO dries, apply 1% hydrocortisone cream and 30 minutes of cold compression. This process (DMSO, hydrocortisone cream, cold compression) should be repeated as above every 2 hours for the first 24 hours.
- After 24 hours of the above, for the next 7 days, 98% DMSO should be applied every 6 hours alternating with 6 hourly applications of 1% hydrocortisone cream, so that a preparation is being applied every 3 hours overall.

Note 3: Plastic surgeon referral and Flush-out procedure

After peripheral or central extravasation of any vesicant or exfoliant, seek advice from the Lead Chemotherapy Nurse or Day Services Manager regarding an urgent referral to a plastic surgeon for a saline flush-out.

In the case of a "large" volume extravasation of a vesicant or exfoliant, urgent saline flush-out of the extravasation area, as soon as possible, ideally within 2 hours, and no later than 24 hours after extravasation¹, should always be considered. Unfortunately the literature does not define "large", as it is often dependent on the size and age of the patient, as well as the nature of the drug.

For anthracycline extravasation, the flush-out technique should **not** be used in combination with dexrazoxane (Savene).

See below for **plastic surgeon contact details** for each Trust:

- For patients receiving chemotherapy at RSCH, a Consultant plastic surgeon should be contactable via RSCH switchboard. If unavailable via this route, contact the consultant plastic surgeon secretary at RSCH or St George's for further advice.
- For patients receiving chemotherapy at SASH, contact the Plastics SpR on-call at Queen Victoria Hospital (switchboard tel 01342 414000).
- For FPH and ASPH patients, contact the Consultant plastic surgeon at Chelsea & Westminster hospital via the C&W switchboard (tel 0208 7468000). At FPH, there is also a plastic surgeon secretary on site, who is available in normal working hours on ext 4160.
- For the saline flush-out, the patient will usually need to travel to the hospital where the plastic surgeons are based. **As the procedure is potentially limb-saving (mention this to the ambulance service), an emergency ambulance should be requested for the transfer.**

Note 4: Guidance for prescribing of dexrazoxane (Savene) - for use in Adults only

Dexrazoxane is a DNA topoisomerase II drug that protects against tissue damage with certain anthracyclines: doxorubicin, epirubicin, daunorubicin and idarubicin.

Side effects include nausea (very common) and neutropenia/thrombocytopenia (common).

It **MUST ONLY** be prescribed in the following circumstances:

- ❖ If there is a suspected peripheral extravasation of **5ml or more** of doxorubicin, epirubicin, daunorubicin or idarubicin.

OR

- ❖ There is an extravasation of doxorubicin, epirubicin, daunorubicin or idarubicin via the central venous route.

The case must be discussed with the Trust Lead Chemotherapy Nurse, or the Senior Chemotherapy Sister, as well as the patient's Consultant, before Savene is prescribed.

See Appendix G for more details with regards to prescribing dexrazoxane.

Dexrazoxane (Savene) is a cytotoxic drug. It must therefore be reconstituted in a pharmacy aseptic unit.

The Savene pre-printed prescription, which is available in Appendix H, should be used for prescribing.

Arrangements for preparation and delivery of a dose of dexrazoxane (Savene)

10 vials of Savene are stored in the aseptic department at RSCH. This is sufficient to treat one anthracycline extravasation. See Appendix J and below for the supply and delivery arrangements:

a) Request for Day 1 Savene dose during normal aseptic working hours

RSCH

- St Luke's Pharmacy to fax prescription to the Pharmacy Aseptic Unit for reconstitution
- Prepared dose delivered to clinical area for administration

ASPH / FPH / SASH

- Pharmacy Department at relevant Trust to fax an order to RSCH Pharmacy Aseptic Unit for Savene reconstitution. Receipt of this fax should be confirmed by telephone.
- Transport should be organised by RSCH pharmacy staff, according to Appendix J. The urgent nature of the delivery should be highlighted in order that the 6 hour window of efficacy is not breached, and a transport collection time agreed.
- The pre-prepared Savene dose is transported to a pre-specified location at ASPH, FPH or SASH.
- RSCH will invoice the Trust for the Savene, via the usual mechanism for invoicing chemotherapy.

b) Extravasation identified out of aseptic working hours

- Savene cannot be considered as a treatment option. An urgent plastic surgeon referral for a saline flush-out should be considered.

Day 2 and Day 3 doses of Savene

Day 2 and Day 3 doses of Savene should be given at the same time of day (+/- 3 hours) as Day 1.

Once reconstituted, the shelf-life for Savene is only 4 hours at 2 - 8°C.

If either of the Day 2 and Day 3 doses falls on a weekend or Bank Holiday, RSCH aseptic unit cannot guarantee a service. The situation would have to be discussed on a case by case basis at the time of the event. If staff are available and willing to come in, then an exceptional out of hours service would be provided in order to aseptically prepare the dose, plus ensure urgent transportation to the required location.

See Appendices G, H and J for further information on Savene prescribing, preparation, administration, and transport arrangements.

See Appendices for:

- Appendix A: Classification of cytotoxics according to extravasation risk
- Appendix B: Contents of cytotoxic extravasation kit
- Appendix C: Chart of cytotoxic drugs according to immediate treatment
- Appendix D: Cytotoxic extravasation documentation form
- Appendix E: Patient Information Leaflet
- Appendix F: DMSO Unlicensed Medicine recording sheet
- Appendix G: Preparation and administration of Savene (Dexrazoxane)
- Appendix H: Pre-printed prescription template for Savene (Dexrazoxane)
- Appendix J: Transport Arrangements for Savene

References:

- Allwood M, Stanley A, Wright P; Cytotoxics Handbook 4th Ed. Radcliffe Medical Press: Oxford 2002
- European Oncology Nursing Society (EONS) Extravasation Guidelines 2007
- Dougherty, L and Lister, S. RMH Manual of Clinical Nursing Procedures 8th Edition (2011)
- ¹Gault, DT; Br J Plast Surg 1993; 46: 91 – 96
- Mouridsen, H et al; Annals of Oncology 2007; 18: 546 – 550

APPENDIX A:

Classification of cytotoxic drugs according to their potential to cause serious necrosis when administered outside of the vein, known as extravasation or infiltration

Vesicants* Group 1	Exfoliants* Group 2	Irritants Group 3	Inflammitants Group 4	Neutrals Group 5
Amsacrine	Cisplatin	Bendamustine	Fluorouracil	Alemtuzumab
Cabazitaxel	Liposomal Daunorubicin	Carboplatin	Methotrexate	Asparaginase
Carmustine	Docetaxel	Dexrazoxane	Raltitrexed	Bevacizumab
Dacarbazine	Liposomal Doxorubicin	Etoposide		Bleomycin
Dactinomycin	Mitoxantrone	Irinotecan		Bortezomib
Daunorubicin	Oxaliplatin			Cetuximab
Doxorubicin	Topotecan			Cladribine
Epirubicin				Cyclophosphamide
Idarubicin				Cytarabine
Mitomycin				Eribulin
Paclitaxel				Fludarabine
Streptozocin				Gemcitabine
Treosulfan				Ifosfamide
Vinblastine				Ipilimumab
Vincristine				Melphalan
Vindesine				Pemetrexed
Vinflunine				Pentostatin
Vinorelbine				Rituximab
				Trastuzumab

Definitions:

***Vesicants:** Drugs which are capable of causing pain, inflammation and blistering of the local skin, underlying flesh and structures, leading to tissue death and necrosis

***Exfoliants:** Drugs which are capable of causing inflammation and shedding of the skin, but less likely to cause tissue death

Irritants: Drugs which are capable of causing inflammation, irritation or pain at site of extravasation, but rarely cause tissue breakdown

Inflammitants: Drugs which are capable of causing mild to moderate inflammation and flare in local tissues

Neutrals: Inert or neutral compounds that do not cause inflammation or damage.

APPENDIX B: CONTENTS OF CYTOTOXIC EXTRAVASATION KIT

- Hyaluronidase 1,500 units injection (1 ampoule)
- Hydrocortisone 1% cream – labelled with directions for use
- Sterile water for injection 1 x 10ml
- Dimethyl sulfoxide (DMSO) 98% solution 1 x 10ml bottle with applicator
- Hot Pack
- Cold Pack
- Cytotoxic Drug Extravasation documentation form (see Appendix D)
- Patient information leaflet (see Appendix E)
- DMSO Unlicensed medicine recording sheet (see Appendix F)

APPENDIX C: Chart of cytotoxic drugs according to immediate treatment in the event of extravasation:

Drug	Cold/Warm pack	Treatment
Amsacrine	Cold	Hydrocortisone cream
Bendamustine	Cold	Hydrocortisone cream
Bleomycin	None	No antidote
Bortezomib	None	No antidote
Cabazitaxel	Warm	Hyaluronidase
Carboplatin	Cold	Hydrocortisone cream
Carmustine	Cold	Hydrocortisone cream
Cisplatin	Cold	Hydrocortisone cream
Cladribine	None	No antidote
Cyclophosphamide	None	No antidote
Cytarabine	None	No antidote
Dacarbazine	Cold	Hydrocortisone cream
Dactinomycin	Cold	DMSO
Daunorubicin	Cold	DMSO (<i>*but see below</i>)
Docetaxel	Warm	Hyaluronidase
Doxorubicin	Cold	DMSO (<i>*but see below</i>)
Epirubicin	Cold	DMSO (<i>*but see below</i>)
Eribulin	None	No antidote
Etoposide	Cold	Hydrocortisone cream
Fludarabine	None	No antidote
Fluorouracil	Cold	Hydrocortisone cream
Gemcitabine	None	No antidote
Idarubicin	Cold	DMSO (<i>*but see below</i>)
Ifosfamide	None	No antidote
Irinotecan	Cold	Hydrocortisone cream
Liposomal, Daunorubicin	Cold	DMSO (for 10 – 14 days)
Liposomal, Doxorubicin	Cold	DMSO (for 10 – 14 days)
Melphalan	None	No antidote
Methotrexate	Cold	Hydrocortisone cream
Mitomycin	Cold	DMSO
Mitoxantrone	Cold	DMSO
Oxaliplatin	Warm	Hyaluronidase
Paclitaxel	Warm	Hyaluronidase
Pemetrexed	None	No antidote
Pentostatin	None	No antidote
Pixantrone	None	No antidote
Raltitrexed	Cold	Hydrocortisone cream
Streptozocin	Cold	Hydrocortisone cream
Topotecan	Cold	Hydrocortisone cream
Treosulfan	Cold	Hydrocortisone cream
Vinblastine	Warm	Hyaluronidase
Vincristine	Warm	Hyaluronidase
Vindesine	Warm	Hyaluronidase
Vinflunine	Warm	Hyaluronidase
Vinorelbine	Warm	Hyaluronidase

**For ≥ 5ml volume peripheral extravasation, or any central extravasation, of an anthracycline, Savene may be a more appropriate alternative. Discuss with the Lead Chemotherapy Nurse or Day Centre Manager*

If an extravasation occurs and the drug is not listed above, please contact pharmacy for classification and advice.

APPENDIX D: Cytotoxic Drug Extravasation Documentation Form (Part 1)

Patient Name:

Hospital number:

Please complete ALL sections in BLOCK capitals and in black ink

- 1) Name of drug (s):
- 2) Date and Time of Extravasation:
- 3) Signs and symptoms to alert you to a possible extravasation: please circle Yes or No
 - a) Did the patient complain of:
 - Burning Yes / No
 - Stinging Yes / No
 - Other acute changes Yes / No - If answer is Yes, please specify:
 - b) Was the injection / infusion site:
 - Indurated Yes / No
 - Swollen Yes / No
 - Red Yes / No
 - Blistered Yes / No
 - c) Was there:
 - Blood return Yes / No
 - Resistance on plunger of bolus syringe Yes / No
 - Absence of free flow of infusion Yes / No

Please now document the 'Emergency Nursing Management' section before completing the rest of this form

- 4) Bolus or infusion? (Please circle one)
- 5) Type of device: Cannula / Other (Please specify, including gauge)
- 6) Was a pump being used? Yes / No
- 7) a) How much of the drug had been given?
b) Estimate how much had extravasated
- 8) Extravasation site – Please roughly draw area on body, e.g. arm, and illustrate position of device, extravasation area, length and width of affected area (cm)

Staff Name and designation:

Clinical Area:

Signature:

Date:

Please photocopy this form and send one copy with the Trust incident form and place one copy in the patient's notes

Emergency Nursing Management (Part 1 continued)

Patient Name:

Hospital number:

Name of Drug(s):

Date and Time:

** Please date and time and sign for ALL steps **

Nursing Management	Has this been done?	If the answer is NO, give reasons	Date and Time	Nurse Signature
1. Stop the infusion. Withdraw as much drug as possible.	Yes / No			
2. Mark area of skin with indelible pen.	Yes / No			
3. Remove the device where appropriate. (do not remove CVAD)	Yes / No			
4. Consider flush-out technique	Yes / No			
5. See Appendix C and Pages 3 – 4 of the Alliance extravasation policy for specific management of suspected cytotoxic	Yes / No			
6a) For vinca alkaloids, paclitaxel, docetaxel, cabazitaxel or oxaliplatin; use hyaluronidase and a warm pack as directed on page 3 of the Alliance extravasation policy.	Yes / No			
6b) For extravasation of doxorubicin, idarubicin, epirubicin or daunorubicin; 5ml or more peripherally or any volume via a CVAD: contact your LCN to advise on use of Savene.	Yes / No			
6c) For anthracyclines (where Savene not appropriate), mitomycin, mitoxantrone or dactinomycin; use a cold pack and apply DMSO and hydrocortisone cream as directed on pages 3 & 4 of the Alliance extravasation policy.	Yes / No			
6d) For amsacrine, carboplatin, cisplatin, dacarbazine, etoposide, 5FU, irinotecan, methotrexate, raltitrexed, streptozocin, topotecan; use a cold pack and hydrocortisone cream as directed on page 3 of the Alliance extravasation policy.	Yes / No			
6e) For neutral cytotoxics, no specific antidote required	Yes / No			
7. Elevate the limb	Yes / No			
8. Inform the patient's oncology / haematology Consultant or SpR for assessment and consideration of referral to plastic surgeon	Yes / No	Name of doctor informed:		
9. Implement any further medical treatment prescribed	Yes / No	If yes, give details:		
10. Has a photograph been taken?	Yes / No			
11. Give patient the Extravasation Patient Information Sheet	Yes / No			
12. Follow up arrangements made	Yes / No			

Please photocopy this form and send one copy with the Trust incident form and place one copy in the patient's notes

Cytotoxic Drug Extravasation Documentation Form (Part 2)

Follow Up Flow Chart for Suspected Extravasation of Vesicant / Exfoliant

Patient Name:	Hospital Number:	Ward:							
Date & Time of Extravasation:				Name of Drug Extravasated:					
Follow Up (To score, refer to grading scale below)									
Day	1	3	5	7	14	21*	28*	35*	42*
Date									
Call / Visit									
Skin Colour									
Skin Temperature									
Skin Integrity									
Oedema									
Mobility									
Pain									
Fever									
Nurse Initials									
* May be omitted if signs and symptoms of extravasation resolved									
Grading Scale									
Grading Scale	0	1	2	3	4				
Skin Colour	Normal	Pink	Red	Blanched area surrounded by red	Blackened				
Skin Integrity	Unbroken	Blistered	Superficial skin loss	Tissue loss & exposed subcut tissue	Tissue loss & exposed bone/muscle with necrosis crater				
Skin Temp.	Normal	Warm	Hot						
Oedema	Absent	Non-pitting	Pitting						
Mobility	Full	Slightly limited	Very Limited	Immobile					
Pain	Grade using a scale of 0-10; where 0 = no pain and 10 = worst pain								
Fever	Normal	Elevated							

Please photocopy and place one copy in patient's notes and attach one copy to Trust Incident Form

APPENDIX E: Patient Information Sheet on Extravasation

What is extravasation?

Extravasation is the leakage (or accidental infiltration) of drugs outside of the vein and into the surrounding tissues. This can lead to an immediate painful reaction, and may with some drugs result in local tissue damage. You may have noticed pain, stinging, swelling or other changes to the skin at the site of drug administration, or the nurse may have noticed that the drug was not flowing in easily.

Why did this happen?

Extravasation is a rare but known complication of intravenous chemotherapy. It is impossible to prevent this even though we take all possible precautions. The important thing is that it has been detected and treated.

Why is extravasation a problem?

It can lead to pain, stiffness and tissue damage.

What treatment have I received to prevent tissue damage?

The nurse has given you the recommended treatment for the extravasation. Although this will help to minimise the chance of developing further problems, you will need to keep checking the area every day.

Checking the area

Once a day, check the area for the following:

- Has the area changed colour or increased in redness?
- Is the area blistering, peeling or flaking?
- Is the area more uncomfortable?
- Is the pain making it difficult for you to exercise the arm or hand?

What else do I need to do?

- Gently exercise the affected arm or hand.
- Take mild painkillers if required.
- Do not apply any other lotions, creams or ointments unless you have been instructed to do so by a doctor or nurse.
- Do not expose the area to strong sunlight.
- Avoid wearing tight clothing around the affected area.
- Protect the affected area when bathing (or having a shower) so that it does not get wet.

When should I contact you?

If you answered **YES** to any of the questions in the checklist above, or if you have any other concerns, then you must contact someone at this hospital who is experienced in extravasation.

Contact Telephone Number

PHARMACY DEPARTMENT

APPENDIX F: DMSO for Unlicensed Use in Treatment of Extravasation

Dimethyl Sulfoxide (DMSO) 98% Solution

To be used according to the St Luke's Cancer Alliance Guidelines for Prevention and Management of Chemotherapy Extravasation, Version 8, 2014

This product is not licensed for the treatment of extravasation injuries. Therefore patient details must be recorded each time it is used for this purpose.

Please complete the details below:

Patient Name:

Hospital Number:

Consultant:

Date:

DMSO must be prescribed on the drug chart.

Product Details: DMSO 98%

Batch Number:

Expiry date:

Please give this sheet to your pharmacist for replacement supply. The product may only be replaced if the above details have been completed.

APPENDIX G: Preparation and administration of dexrazoxane (Savene)

Dexrazoxane should be given once daily for 3 consecutive days following anthracycline extravasation.

Dexrazoxane dosing is as follows:

Day 1: 1000mg/m² (max 2000mg)
Day 2: 1000mg/m² (max 2000mg)
Day 3: 500mg/m² (max 1000mg)

Dexrazoxane is a cytotoxic drug and therefore may only be reconstituted in a pharmacy aseptic unit.

It has a short shelf life once reconstituted (4 hours at 2 – 8°C).

The patient must be consented for dexrazoxane, as it is a cytotoxic.

The prescription should be written using the template in Appendix H.

Dexrazoxane may only be administered by a trained chemotherapy nurse.

Each dose should be infused, in 500ml of buffered diluent provided with the Savene, over 1 – 2 hours.

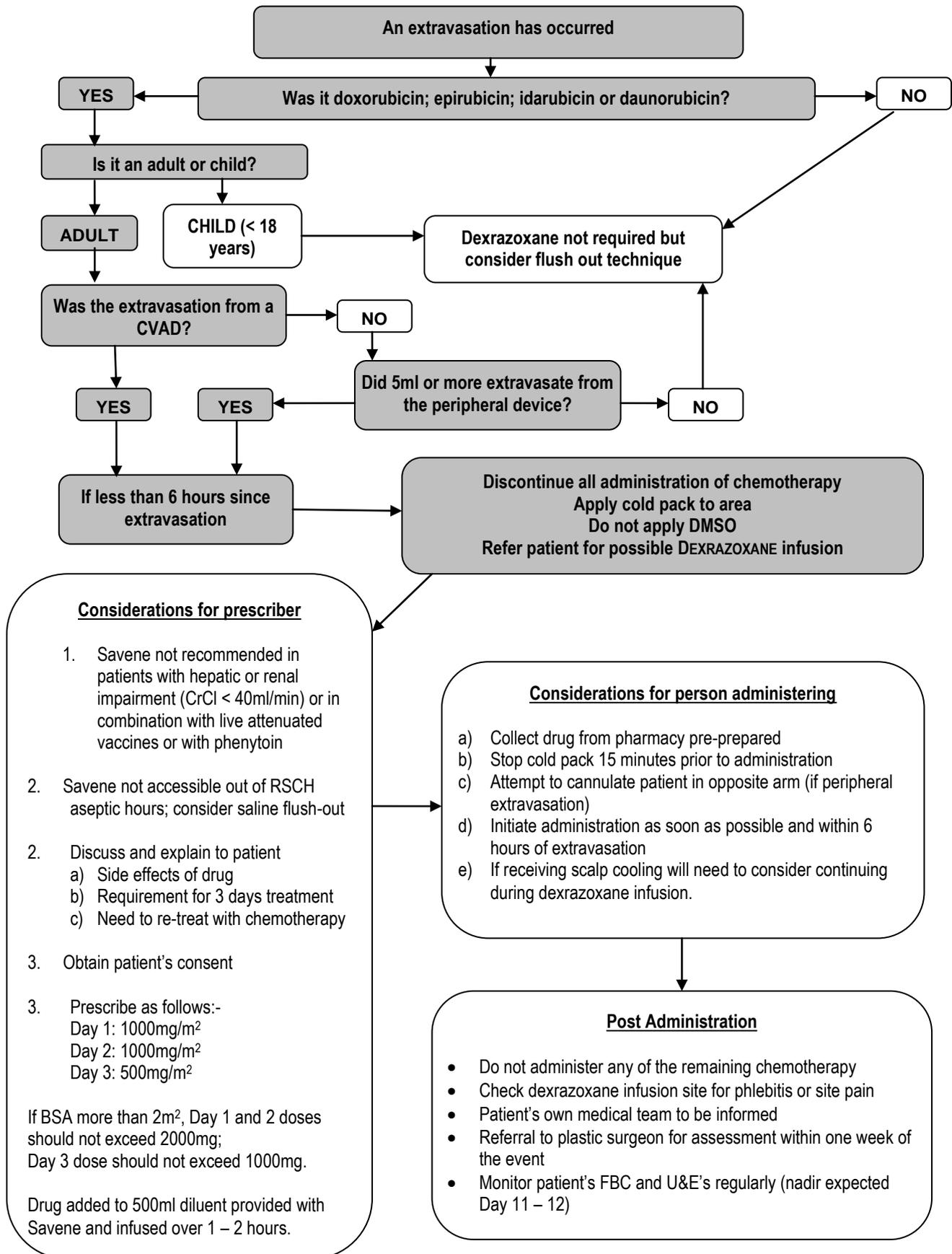
Day 2 and Day 3 doses should be given at the same time of day (+/- 3 hours) as Day 1.

Special precautions for the administration of Dexrazoxane (Savene):

- ❖ The first dose must be administered as soon as possible, and **initiated within 6 hours** of extravasation.
- ❖ Cooling and DMSO should not be used in combination with treatment with dexrazoxane (local cooling should be removed at least 15 minutes prior to administration) as they may interfere with efficacy of dexrazoxane. Hydrocortisone cream should also not be used.
- ❖ The patient should be cannulated in the opposite arm to the extravasation wherever possible or, if this is not possible, higher than the site of extravasation.
- ❖ This current cycle of chemotherapy must be discontinued and not restarted until at least 48 hours following day 3 infusion. The consultant must be informed as soon as possible as they will need to consider re- prescribing the cycle of chemotherapy.
- ❖ It is not recommended in **children** (age < 18 years) or in patients with **hepatic or renal impairment (CrCl < 40ml/min)**.
- ❖ It is generally not recommended in combination with live attenuated vaccines or with phenytoin.
- ❖ Patients at risk of hyperkalaemia should be monitored for plasma potassium levels. It also contains sodium which may be harmful to patients who have a raised sodium level.
- ❖ Patients on anticoagulants should be monitored more frequently i.e. daily whilst patient receiving dexrazoxane.
- ❖ Local examination (for phlebitis and local injection site pain) and haematological monitoring should be performed on a regular basis (e.g. daily) after treatment until resolution.
- ❖ Patient referral to a plastic surgeon for assessment of the extravasation injury within 7 days after the extravasation is mandatory.

This is an expensive drug; therefore you should seek guidance for prescribing from your Lead Chemotherapy Nurse or Day Centre Manager, and consult the dexrazoxane algorithm below.

Dexrazoxane (Savene) Algorithm



APPENDIX H: Dexrazoxane prescription chart

Patient Addressograph or details: Patient Name: Address: DOB: Hospital Number:	CONSULTANT:	CHEMOTHERAPY REGIMEN:
	ALLERGIES:	Ht: m Wt: kg BSA: m ²

Dexrazoxane (Savene®) 1000mg/m² IV Days 1 & 2, then 500mg/m² IV Day 3

Must ONLY be prescribed in the following circumstances:

- **5ml or more peripheral** extravasation of **doxorubicin, epirubicin, daunorubicin** or **idarubicin**
- **All central** venous extravasations of **doxorubicin, epirubicin, daunorubicin** or **idarubicin**
- Adult patients only (age > 18 years)
- Case discussed first with Trust Lead Chemotherapy Nurse or Senior Chemotherapy Sister
- Infusion initiated less than six hours after extravasation event (administer as soon as possible)
- Written patient consent obtained (dexrazoxane is cytotoxic)
- Not recommended for patients with hepatic or renal impairment (CrCl <40ml/min), or those taking phenytoin, or recently received a live attenuated vaccine

Refer to extravasation policy and treatment algorithm for full details.

Do not apply DMSO, stop cold pack at least 15 minutes prior to dexrazoxane administration.

Each daily dose should be given at the same time of day (+/- 3 hours)

DATE:

LOCATION:

Drug	Dose	Route	Administration details	Prescriber sig. & date	Date given	Time given	Sig. of nurse
DAY 1	*Ondansetron	8 mg	PO	* If not given prior to extravasation			
	*Dexamethasone	8 mg	PO	* If not given prior to extravasation			
	Dexrazoxane 1000 mg/m ² (Max 2000 mg)	mg	IV	In 500ml of buffered diluent (provided with Savene) Infuse over 1 – 2 hours			
DAY 2	Ondansetron	8 mg	PO				
	Dexamethasone	8 mg	PO				
	Dexrazoxane 1000 mg/m ² (Max 2000 mg)	mg	IV	In 500ml of buffered diluent (provided with Savene) Infuse over 1 – 2 hours			
DAY 3	Ondansetron	8 mg	PO				
	Dexamethasone	8 mg	PO				
	Dexrazoxane 500 mg/m ² (max 1000mg)	mg	IV	In 500ml of buffered diluent (provided with Savene) Infuse over 1 – 2 hours			

CONFIRMED BY:

DATE:

PHARMACIST:

DATE:

FAXED:

APPENDIX J: Guide to Transport Arrangements for Savene

This guide should be followed for delivery of Savene to St Peter's Hospital, Ashford Hospital, East Surrey Hospital or Frimley Park Hospital.

(If a patient is at Crawley Hospital, they will be transferred to East Surrey Hospital for Savene administration)

As Savene administration needs to be initiated as soon as possible following an anthracycline extravasation - and no later than 6 hours after the extravasation - it is important to organise urgent transport of the Day 1 dose of Savene to the requesting Trust.

Also note that, once reconstituted, the shelf-life for Savene is only 4 hours at 2 – 8°C.

To minimise the delivery time, transport will always be organised by RSCH pharmacy staff, rather than the requesting Trust.

The requesting Trust must inform the RSCH pharmacist exactly where the Savene is to be delivered e.g. specify the ward name, or pharmacy department.

The options for transport are:

a) RSCH Trust hospital transport

Hospital transport desk open 8am to 5pm Monday - Friday

Tel no: 01483 464895 or 01483 464111

The hospital transport service cannot guarantee a rapid response time, and is not designed to provide an emergency service, but should be contacted first within working hours, as there may be a vehicle available. Hospital transport should only be used if it is available to leave RSCH within 30 minutes maximum from the time that aseptics expect the prepared dose to be ready.

b) City Cabs and Cars Ltd

Tel no: 01483 888666 or 01483 560063

If there is no hospital transport available to leave RSCH within a suitable timeframe, transport should be arranged with this local taxi company, with whom RSCH have an account.

RSCH switchboard staff will book the taxi on our behalf (switchboard have the RSCH account number, which needs to be quoted). Pharmacy need to give the switchboard staff our Pharmacy cost centre code.

RSCH pharmacy will bill the requesting Trust retrospectively for the taxi fare.

Whichever transport service is booked, ensure that a **collection time** and **collection place** are agreed, and that the driver is aware of the urgent nature of the delivery.