CLINICAL GUIDELINE FOR *THE MANAGEMENT OF* EXTRAVASATION OF CYTOTOXIC DRUGS IN ADULTS

1. Aim/Purpose of this Guideline

1.1. This document outlines guidelines for the rapid treatment of extravasation injuries within Royal Cornwall Hospital Trust.

1.2. It provides a guideline to assist practitioners in the care of patients who may have experienced an extravasation injury.

1.3. It will provide a basis for the nursing staff to recognise ways in which to help prevent extravasation and how to recognise when an extravasation has occurred.

2. The Guidance

2.1. Duties for Implementation

2.1.1. The Trust Lead for Cancer Chemotherapy is responsible for ensuring the implementation and adherence to these guidelines.

2.1.2. These guidelines apply to all personal involved in the administration of intravenous Chemotherapy.

2.1.3. The Chemotherapy Clinical Nurse Specialist is responsible for the education and development of nursing staff in the handling, administration and disposal of cytotoxic drugs.

2.1.4. It is the individual practitioner's responsibility to ensure the training they have received is appropriate and remains updated.

2.1.5. It is the clinical managers' responsibility to ensure that an extravasation kit is available in areas where cytotoxic drugs are administered. That all staff has knowledge of its location and that its contents remain in date.

2.2. Definition

2.2.1. Extravasation is the leakage or accidental infiltration of intravenous drugs into the surrounding tissues from the vein. This can lead to an immediate inflammatory painful reaction and with some drugs may result in local tissue destruction (necrosis) and other complications.

2.2.2. They are classified into the following categories:

2.2.2.1. Neutrals: do not cause ulceration and are unlikely to produce an acute reaction or progress to necrosis.

2.2.2.2. Inflammatory Agents: Capable of causing inflammation and irritation and flare in local tissues

2.2.2.3. Irritants: are capable of causing inflammation and irritation. They rarely proceed to the breakdown of tissues. They do have the potential to cause ulceration, but only if a large amount has extravasated into the tissue.

2.2.2.4. Exfoliants are capable of causing inflammation and shedding of the skin, but are less likely to cause tissue death. They can cause pain

2.2.2.5. Vesicants are drugs that have the potential to cause blistering and ulceration, which when left untreated can lead to tissue damage and necrosis.

2.2.3. It is recognised that prevention of extravasation is of importance and particularly when administering vesicants, exfoliates or irritants the precautions should be taken to minimise the risk of extravasation, see appendix 1.

2.2.4. It is accepted that there are also other contributing factors that can affect each individual patient's risk of extravasation, see appendix 2.

2.2.5. It is recommended that no bolus doses of anthracyclines should be administered after 8pm, and infusional anthracyclines MUST be given via central line.

2.2.6. There are many non-cytotoxic drugs that can equally be as destructive in the damage that they can cause if extravasation occurs (see appendix 3), the main bulk of this document relates to cytotoxic chemotherapy, but the procedure outlined can be used for all drugs.

2.2.7. Cancer drugs have been grouped into 5 categories based on their potential to cause tissue damage, see appendix 4.

2.3. Patient Education

2.3.1. Patients should be made aware of the risk of extravasation when consent for chemotherapy is obtained

2.3.2. Patient preference to cannulation site should be taken into account, but education given as to why good placement and site rotation is required.

2.3.3. Education should encourage patients to inform nursing staff if they have pain, stinging, burning or a change in sensation at cannulation site from start of the infusion.

2.3.4. In the advent of an extravasation patients should be provided with both verbal and written information, see appendix 5.

2.4. Signs and Symptoms

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

2.4.1.1. The patient complains of burning, stinging, pain or any discomfort at the injection site. This should be distinguished from a feeling of cold that may occur with some drugs. The patient is often the first person to become aware that something is wrong with the IV therapy, so instruct them at the beginning of treatment to inform staff of any acute change during treatment.

2.4.2. Observation of swelling, redness, mottling or blistering at the injection site. This should be distinguished from the 'nettle rash' or 'flare' effect seen with some drugs.

2.4.3. Care should be taking when no 'flash back' or blood return is obtained on aspiration. However, this is not a sign of extravasation if found in isolation and the presence of blood does not exclude extravasation

2.4.4. There is increased resistance felt on the plunger of the syringe of a bolus drug administration, this however, could be due to possible changes in the position of the body.

2.4.5. There is absence of free flow or the rate of flow is remarkably reduced. This may not be recognisable when using an infusion pump.

2.5. Treatment of Peripheral Line Extravasation:

2.6. Initial treatment for all drugs

2.7. Explain to the patient what you suspect may have happened and the procedures for dealing with it so as to obtain their co-operation. Inform the patient's medical team, senior nursing staff, obtain extravasation kit and document as required.

2.8. Stop the injection/infusion immediately leaving the cannula in place. Where the abrupt discontinuation of a treatment would be clinically detrimental inform the medical team immediately.

2.9. Aspirate any residual drug and blood from the cannula. This will allow the direct removal of as much of the drug as possible at the site of the extravasation and thereby minimise progressive local injury and reduce subsequent tissue damage.

2.10. Mark any demarcated area with an indelible pen.

2.11. Remove the cannula.

2.12. Determine whether the agent that has extravasated requires the application of a hot or cold compress. Using the wrong temperature compress can exacerbate the injury.

2.13. Apply the correct compress.

2.14. Elevate the affected area.

2.15. Offer patient appropriate analgesia and reassurance

2.16. Obtain digital photographs of extravasated area.

2.17. The details of the extravasation incident together with all the treatment administered must be documented in the patient's medical notes and RCHT Extravasation Data collection form, available in the extravasation kit should be completed.

2.18. Obtain the Extravasation Kit

2.19. Treatment After Initial First Aid:

2.20. Vesicants

2.20.1. Confirm all the initial first aid procedures have been completed

2.20.2. The important indicator of the severity of extravasation is pain.

2.20.3. For small amounts of extravasated drug causing only minor symptoms apply 1% hydrocortisone cream, apply HOT or COLD COMPRESS as recommended. Give an intravenous dose of 100mg Hydrocortisone and 4mg dose of oral chlorphenamine.

2.20.4. Treat with appropriate antidote. Extravasation injuries treated with specific antidotes should be reviewed hourly over the first 12 hours for signs of deterioration and 4 hourly thereafter. They must be admitted to Lowen Ward.

2.20.5. If any deterioration is noted during this period contact the on call plastic surgeon.

2.20.6. DO NOT COVER WITH BANDAGING and continue to observe hourly for 24 hours.

2.20.7. In the event of a more extensive extravasation refer to the Plastic Surgery on call team. Referral within a few hours is essential if active treatment to remove extravasated substance is to be performed.

2.20.8. If the skin viability is compromised, dressing advice can be obtained from Tissue Viability

2.21. Exfoliants

2.21.1. Confirm all the initial first aid procedures have been completed

2.21.2. For extensive extravasations of exfoliant drugs treat in the same way as a vesicant extravasation. The important indicator of the severity of extravasation is pain.

2.21.3. For small amounts of extravasated drug causing only minor symptoms apply 1% hydrocortisone cream, apply HOT or COLD COMPRESS and

consider giving an intravenous dose of 100mg Hydrocortisone and 4mg dose of oral chlorphenamine.

2.21.4. In the event of the development of more severe symptoms follow the vesicant treatment instructions.

2.21.5. Continued monitoring for several days may be recommended, arrange follow up in the Headland as required.

2.21.6. If the skin viability is compromised, dressing advice can be obtained from Tissue Viability.

2.22. Irritant

2.22.1. Confirm all the initial first aid procedures have been completed

2.22.2. With irritant drugs there exists the possibility of some local inflammation and rarely necrosis, and/or some pain in sensitive individuals.

2.22.3. For small amounts of extravasated drug causing only minor symptoms apply 1% hydrocortisone cream, apply HOT or COLD COMPRESS.

2.22.4. For a large volume extravasation consider the risk of a more significant reaction. Apply 1% hydrocortisone cream and consider giving an intravenous dose of 100mg Hydrocortisone and 4mg dose of oral chlorphenamine.

2.22.5. Inform the patient that if there appears to be any deterioration in the injury they must contact the unit immediately. Arrange for the injury to be reviewed the following day in the Headland Unit.

2.22.6. If the skin viability is compromised, dressing advice can be obtained from Tissue Viability.

2.23. Inflammatory Agents

2.23.1. Confirm all the initial first aid procedures have been completed.

2.23.2. For small amounts of extravasated drug causing only minor symptoms apply 1% hydrocortisone cream, apply HOT or COLD COMPRESS.

2.23.3. For a large volume extravasation consider the risk of a more significant reaction. Apply 1% hydrocortisone cream and consider giving an intravenous dose of 100mg Hydrocortisone and 4mg dose of oral chlorphenamine

2.23.4. Inform the patient that if there appears to be any deterioration in the injury they must contact the unit immediately. Arrange for the injury to be reviewed the following day in the Headland Unit.

2.24. Neutral

2.24.1. If extravasation of a non-irritant occurs, aspirate as much fluid as possible then remove the cannula. No further treatment should be required. Manage the situation symptomatically.

2.25. <u>All</u>

2.25.1. The details of the extravasation incident together with all the treatment administered must be documented in the patient's medical notes, the RCHT incident reporting system (DATIX) and RCHT Extravasation Data collection form, available in the extravasation kit should be completed.

2.25.2. Provide patient with a copy of the Patient information sheet.

2.26. Treatment of Extravasation from Central Venous Access Devices: PICC's, Hickman Lines and Portacaths

2.27. Although less likely to occur an extravasation occurring from an indwelling central line can be particularly problematic because of the depth of the line and the potential of slower development of signs and symptoms.

2.28. Extravasation can either occur in the tunnelled section or in the deep section of the implanted line.

2.29. Extravasation can occur due to fracture of the catheter, perforation of the superior vena cava, formation of a fibrin sheath on catheter or incomplete placement or dislodgement of the needle.

2.30. Patients should be educated of the possibility of this happening and that burning or pain on administration is not normal and should be reported immediately.

2.31. Regardless of drug classification stop the administration leave the central line in place. Immediately refer to senior member of staff, registrar and/or patients consultant

2.32. Aspirate as much as the drug as possible.

2.33. Mark area with pen and take digital pictures of area

2.34. Apply HOT or COLD COMPRESS. Give an intravenous dose of 100mg Hydrocortisone and 4mg dose of oral chlorphenamine, via new cannula.

2.35. Referral to plastic surgeon should be made in all cases

2.36. The line should be x-rayed and removed as soon as clinically appropriate

2.37. The details of the extravasation incident together with all the treatment administered must be documented in the patient's medical notes, the RCHT incident reporting system (DATIX) and RCHT Extravasation Data collection form, available in the extravasation kit should be completed.

2.38. Mixed Extravasations

2.39. In the event of an extravasation where different agents may have been given the following applies.

2.40. The order of priority is vesicant, exfoliants, irritant.

2.41. For drugs of different classifications apply the temperature compress of the drug that takes priority.

2.42. For drugs of the same classification a cold compress takes priority over a hot compress.

3. Monitoring compliance and effectiveness

All Extravasations will be recorded and DATIX as pre policy. An audit of these will be completed once a year and presented at the Chemotherapy Multi Disciplinary team meetings, by the chemotherapy CNS or chemotherapy support CNS

Element to be monitored	All Chemotherapy Extravasations
Lead	Chemotherapy MDT
Tool	Extravasation reported on DATIX and those reported on the national green card reporting system
Frequency	Monitor Yearly
Reporting arrangements	Chemotherapy MDT Extravasations DATIX reported and reviewed by MDT each month and a yearly report made. If Treads are recognised more frequently in Extravasations these will be addressed with further investigation
Acting on recommendations and Lead(s)	Chemotherapy clinical Lead will be responsible for action planning for any or all deficiencies and recommendations.
Change in practice and lessons to be shared	. Required changes to practice will be identified and actioned within one month. A lead member of the team will be identified to take each change forward where appropriate. Lessons will be shared with all the relevant stakeholders

4. Equality and Diversity

4.1. This document complies with the Royal Cornwall Hospitals NHS Trust service Equality and Diversity statement which can be found in the 'Equality, Diversity & Human Rights Policy' or the Equality and Diversity website.

4.2. Equality Impact Assessment

The Initial Equality Impact Assessment Screening Form is at Appendix 9.

Appendix 1. Prevention of Extravasation

- Risk assessment of veins should be carried out. Where possible a large vein away from joints or tendons should be selected for the insertion of the cannula. Insertion over joints should be avoided as displacement of the cannula is more likely, and tissue damage in this area may have serious consequences. It is recommended that the antecubital fossa should only be used as a last resort.

- Smaller gauge flexible cannulas are preferable for the administration of vesicants; rigid steel cannulas should not be used. The correct clear dressing should be used to secure site.

- Rotation of cannulation site to help minimise vein trauma.

- Some patient groups are at increased risk of extravasation. These include elderly and paediatric patients, patients on anticoagulants, thrombocytopaenic patients, unconscious or sedated patients, patients with lymphoedema, patients with peripheral neuropathy or peripheral circulatory diseases. Extra care should be taken with these patient groups.

- Wherever possible, vesicant drugs in a chemotherapy regimen should be given before the other cytotoxic agents. Peripheral bolus doses of vesicants should be given via a fast running infusion of a compatible fluid.

- Patency of the line should be established prior to and during the administration of vesicants, using flash back observation. For boluses, patency should be checked every 3-5mls, and for infusions, patency should be checked every 5-10 minutes.

- The infusion site should always be visible during drug administration.

(Dougherty (2008), EONS (2007) and Sauerland et al (2006))

Appendix 2. Extravasation Risk Factors

A number of other patient factors may play a part in increasing the risk of extravasation

- Extravasation injuries are both more common and severe in children and neonates. Infants may not be able to localise pain.
- Elderly patients can be more at risk of extravasating due to having more fragile skin and veins. They can also be confused or agitated, pull at and dislodging cannulas.
- Patients with communication difficulties or those unable to speak English will be more at risk of extravasation injuries going unnoticed.
- Cancer patients are at increased risk, such as those with lymphoedema and breast disease and patients would have experienced multiple venepunctures due to previous treatments.
- Patients with underlying medical conditions, such as diabetes and peripheral circulatory diseases such as Raynaud's disease will be less able to detect extravasation events.
- Patients who have had previous radiation therapy at the site of injection may develop severe local reactions from cytotoxic drugs. This is known as recall injury and has been noted in patients who have received doxorubicin.
- Prescribed medication may increase the risk of extravasation. For example anticoagulants may exacerbate extravasation by increasing local bleeding

(Schulmeister (2011) & ENOS (2007))

Appendix 3. Non- Cytotoxic Extravasation

Determine which type of drug has extravasated, then using the table; follow the treatment procedure for that class of extravasated drug.

IRRITANTS	**VESICANTS**
Adrenaline (H)	Aciclovir (C)
Amiodarone (C)	Aminophylline (H)
Clarithromycin (C)	Amphotericin (C)
Diazemuls (C)	Calcium Chloride (H)
Dobutamine (H)	Calcium Gluconate (H)
Dopamine (H)	Cefotaxime (C)
Erythromycin (C)	Diazepam (C)
Foscarnet (C)	Digoxin (C)
Noradrenaline (H)	Fluorescein (C)
Phenobarbitone (C)	Ganciclovir (C)
Promethazine (C)	Hypertonic NaCl sol^{n} > 5% (H) Phentolamine (C)
Vancomycin (C)	Parenteral Nutrition (H)
	Phenytoin (H)
	Potassium Chloride (>40mmols/l) (H) Sodium Bicarb. (H)
	Sodium Bicarb (H)
	Venofer (C)

Appendix 4. Classification of Cytotoxic Drugs and Drugs Affecting Immune Response.

Neutrals Group 1	Inflammitants Group 2	Irritants Group 3	Exfoliants Group 4	Vesicants Group 5
Asparaginase	Bortezomib (H)	Carboplatatin (H)	Cisplatin (H)	Amsacrine (C)
Bevacizumab	5-Fluorouracil (C)	Etoposide (H)	Liposomal Daunorubicin (C)	Carmustine (C)
Bleomycin	Methotrexate (H)	Irinotecan (H)	Docetaxol (H)	Dacarbazine (C)
Cetuximab	Raltitrexed (C)	Mylotarg (C)	Liposomal Doxorubicin (C)	Dactinomycin (C)
Cladribine		Teniposide (H)	Mitoxantrone (H)	Daunorubicin (C)
Cyclophosphamide		Arsenic Trisenox (H)	Oxaliplatin (H)	Doxorubicin (C)
Cytarabine		Treosulfan (Dry C)	Topotecan (H)	Epirubicin (C)
Fludarabine		Bendamustine (C)		Idarubicin (C)
Gemcitabine		Tratuzumab Emtansine		Mitomycin C (C)
Ifosfamide				Mustine (C)
Melphalan				Paclitaxel (H)
Pentostatin				Streptozocin (C)
Pemetrexed				Vinblastine (H)
Rituximab				Vinctistine (H)
Thiotepa				Vindesine (H)
Trastuzumab				Vinorebine (H)
Clofarabine (H) Large volumes hyaluronidase				Cabazitaxel
Pertuzumab				Trabectedin (neither, follow policy without compression)
azacitidine				Nab – Paclitaxel (H)
eribulin				Vinflunine (H)
Panitumumab				
Brentuximab				
mifamurtide (mepact),				
ipilimumab				

H = apply hot pack C = apply cold pack
(Adapted from: National Extravasation Information Service 2005)

Immediate treatment for all extravasation:

1. STOP the infusion, but leave cannula in place
2. Identify agent using table below and obtain and apply correct Warm/cold pack. If not listed see main extravasation pack
3. Collect extravasation kit
4. Aspirate as much fluid as possible through the cannula: if possible draw back 3-5mls of blood
5. Mark extravasation with permanent pen
6. Remove cannula
7. Complete DATIX and RCHT Audit form

Vesicants Non-DNA-binding

Cabazitaxel
Paclitaxel
Vinblastine
Vincristine
Vindesine
Vinflunine
Vinorelbine

AIM DISPERSE & DILUTE

- Give several subcutaneous (or intradermal) injections of 150 – 1500 IU of hyaluronidase diluted in 1 mL sterile water as 5 separate 0.2ml injections around the periphery extravasated area to dilute the infusate.
- Use 25 to 27 gauge needle and change after each injection
- Apply hydrocortisone 1% cream every 6 hours for as long as erythema persists.
- Elevate the limb
- Apply a warm pack to the affected area for 20 minutes 4 times daily for 1 to 2 days
- NB. Administration of hyaluronidase should begin within 1 hour of extravasation for best results
- Consider referral to Hand/Plastic Surgeon

Vesicant DNA Binding

Amsacrine
Bendamustine
Carmustine
Darcarbazine
Mitomycin C
Mustine
Trabectidin
Tresulfan

AIM: LOCALISE & NEUTRALISE

- Neutralise the area by applying a thin layer topical DMSO to the marked area using a cotton bud. Do not use DMSO If blistering present.
- Allow the DMSO to dry, and then cover with a non-occlusive gauze dressing, this should be applied within 10-25 minutes
- Apply a cold pack for 20 minutes. Repeat every 4 hours for 24 hours to help localise the area
- 3 hours after first DMSO application apply hydrocortisone 1% cream. Repeat every 6 hours for 7 days
- Elevate the limb
- Consider referral to Hand/Plastic Surgeon

Vesicant DNA Binding

Dactinomycin
Daunorubicin
Doxorubicin
Epirunbicin
Idarubicin

AIM: LOCALISE & NEUTRALISE

- Follow as above
- Large volumes, above 3mls, consider SAVENE

Exfoliantes/Irritants [1]

Arsenic Trioxide
Cyclophosphamide
Liposomal Daunorubicin
Liposomal Doxorubicin
Etoposide
Fluorouracil
Mitoxantrone
Streptozocin

Possible irritants[2]

Carboplatin
Cisplatin
Docetaxel
Gemtuzumab Ozogamicin
Irinotecan
Oxaliplatin
Topotecan

AIM: LOCALISE

- Apply cold/warm pack for 20 minutes every 4 hours for 24 hours
- Apply hydrocortisone cream 1% every 6 hours for 7 days or as long as erythema persists

Non - Vesicants[1]

Aflibercept
Asparaginase
Bleomycin
Bortezomib
Brentuximab vedotin
Cladribine
Clofarabine
Cytarabine
Eribulin
Etoposide phosphate
Fludarabine
Gemcitabine
Ifosfamide
Interferons
Interleukin-2
Methotrexate
Mifamurtide
Melpanlan
Monoclonal antibodies

AIM: SYMPTOMATIC RELIEF

- Elevate the limb
- Consider applying a cold pack if local symptoms occur
- Apply hydrocortisone cream 1% four times each day if erythema is present

[1]Any agent extravasation in high enough volume concentration may be an irritant
[2]There have been few reports of these agents acting as irritants, but there is no clear evidence for this.
In all cases:

- Given analgesia as required
- Arrange follow up @ 24hrs and then as required
- DATIX and complete RCTH Audit form

Appendix 6. Antidotes

Dexrazoxane (Savene):

> **NO bolus doses of anthracyclines should be administered after 8pm, and infusional anthracyclines MUST be given via central line.**

Used for many years to minimize anthracycline cardio toxicity.
It binds to iron and prevents the formation of free radical, which are thought to play a major role in the development of extravasation induced tissue necrosis.

Is the only licensed specific antidote to anthracycline extravasation.

Can be used for both peripheral and central line extravasations.

To be used either immediately or within 6 hours of a positively identified anthracycline extravasation.

Remove cold packs form the area to be treated at least 15min before administration.

Savene must be prescribed by the medical team before giving.

> **Reconstitution of Savene must take place using safe handling techniques, either in the Pharmacy Technical Services Unit or by using the phaseal system provided (see below). If a decision is made to use Savene, a specialist Cancer Pharmacist (in normal working hours) or the on-call pharmacist must be contacted to discuss the best course of action for preparation of the dose.**

Recommended 3 days course of treatment dosed according to body weight:
(Dose reduction should occur in patients with creatinine clearance less than 40mls per minutes

- **Day 1** 1000mg/m^2 IV as soon as possible and no later than 6 hours post extravasation.
- **Day 2** 1000mg/m^2
- **Day 3** 500mg/m^2

For patients with a body surface area of more than 2.O m2 the single dose should not exceed 2000mg on days 1 & 2 and 1000mg on day 3

Preparing Savene using Phaseal

Equipment Required:
Phaseal:
P50 protector (1 per vial)
N35 injector (1 per vial)
C100 infusion adaptor (1 per bag)

Other:
Syringe (1 per vial)
Needle (1 per vial)

Water (25ml per vial)

Procedure Guidelines:

1. Placing the vial on a steady surface, attach the protector to each vial (number required for one patient dose) using a downward force.

2. Draw up 25ml of sterile water into each syringe (using regular needle).

3. Remove needle and attach injector to the end of each syringe.
    a. NB. Once injector is attached to syringe DO NOT REMOVE.

4. Using Push-Turn-Push technique (handling the white part of the injector only), connect the injector (with syringe attached) to the protector on the vial.

5. Keeping the vial and syringe upright, push the water into the vial. The expansion chamber will inflate.

6. Once the Savene is fully reconstituted, draw back the required amount from the vial.

7. Using Pull-Turn-Pull technique, remove the injector from the protector.

8. Spike the provided diluent bag with the Phaseal infusion adaptor.

9. Using Push-Turn-Push technique, connect the injector (with syringe attached) to the infusion adaptor and push the Savene into the bag.

10. Using Pull-Turn-Pull technique, remove the injector from the infusion adaptor. Do not detach injector from syringe.

11. Dispose of syringe (with injector attached) and vial (with protector attached) according to facility protocol.

12. To administer Savene, attach administration set through bottom of infusion adaptor.

<u>Topical Dimethyl sulfoxide (DMSO 99%) (unlicensed):</u>

Is an option for the treatment of extravasation with anthracyclines, Doxorubicin, Idarubicin, Epirubicin and Actinomycin D.

Must not be used if there is a possibility that Savene may be used

It can help to stop the development of skin ulcers in small volume extravasations (less than three mls).

DMSO must be prescribed by the medical team before giving.

- After initial treatment, wearing gloves apply a thin layer of DMSO topically to the marked area.
- Allow to dry
- Apply a non – occlusive dressing

- This should be repeated 4 times a day
- Check area for erythema caused by DMSO

Hyaluronidase

Is a protein enzyme that degrades hyaluronic acid – promotes drug diffusion and enhances drug absorption,

Maybe indicated for the suspected or known extravasation of vina alkaloids.

It can also be used in the event of extravasation of solutions containing calcium or potassium, aminophylline or vesicant antibiotics.

Administration of hyaluronidase should be within one hour of the extravasation for best results.

Hyaluronisase must be prescribed by the medical team before giving

- After initial treatment, dilute 150-1500IU of hyaluronidase in 1 ml of sterile water.
- Administer doses subcutaneously around the periphery of the extravasation.
- Inject 1ml (150IU) as 5 separate 0.2ml injections.
- Use a 24g needle and change after each injection.
- Apply a warm pack for one hour post treatment, then for 20 minutes every four hours for 24-48 hrs

Appendix 7. Extravasation Kit

An Extravasation Kit is to be stored in all areas where the administration of cytotoxic drugs occurs. The kit contains all the drugs and equipment that may be needed in the event of an extravasation. The kit should be checked regularly and re-supplied from pharmacy as required.

Hyaluronidase 1500 units injection.
Hydrocortisone IV
Piriton tablets
Hydrocortisone 1% cream.
Water for injection (5ml).

Heat Pad - instant
Cold Pad (in freezer on ward)

2mL Syringes x 2
19G needles x 2 (for drawing up)
25G needles x 4 (for injection)
Alcohol swabs
10mL syringe x 1
Indelible pen

Extravasation guideline
Coloured copy of flow sheet
RCHT Extravasation audit form
Patient information leaflet

Appendix 8. Governance Information

Document Title	Clinical Guideline for the Management of Extravasation of Cytotoxic Drugs in Adults			
Date Issued/Approved:	December 2014			
Date Valid From:	December 2014			
Date Valid To:	December 2017			
Directorate / Department responsible (author/owner):	CSSC, Chemotherapy MDT – Lisa Nicholls			
Contact details:	01872 258347			
Brief summary of contents	This document outlines guidelines for the rapid treatment of extravasation injuries and provides a guideline to assist practitioners in the care of patients who may have experienced an extravasation injury.			
Suggested Keywords:	Chemotherapy, extravasation,			
Target Audience	RCHT	PCH	CFT	KCCG
	✓			
Executive Director responsible for Policy:	Medical Director			
Date revised:	December 2014			
This document replaces (exact title of previous version):	Clinical Guideline for the Management of Extravasation of Cytotoxic Drugs in Adults Version 3.0			
Approval route (names of committees)/consultation:	Chemotherapy MDT (03.12.14) CSSC Governance DMB (16.12.14)			
Divisional Manager confirming approval processes	Sally Rowe, Divisional Director CSSC			
Name and Post Title of additional signatories	Janet Gardner, Governance Lead CSSC			
Signature of Executive Director giving approval	{Original Copy Signed}			
Publication Location (refer to Policy on Policies – Approvals and Ratification):	Internet & Intranet	✓	Intranet Only	
Document Library Folder/Sub Folder	Clinical / Cancer services			
Links to key external standards	None			
Related Documents:	▪ Dougherty, L (2008) IV Therapy: Recognizing the Differences between infiltration and Extravasation. *British Journal of Nursing*. 17(14) 896-901			

	▪ EONS Extravasation guidelines toolkit (2007) ▪ Pattison, J. (2002) Managing Cytoxic Extravasation. *Nursing Times*; 98(44) 32-33 ▪ Schulmeister,L and Camp-sorrel, D. (2000) Chemotherapy Extravasation from Implanted Ports. *Oncology Nurse Forum*, 27(3) 531-538 ▪ Schulmeister,L (2011) Extravasation Management: Clinical Update. *Seminars in Oncology Nursing*, 27 (1) 82-90 ▪ Schulmeister,L. Chapter 34 Extravasation in Oliver (2010) *The MASCC textbook of Cancer Supportive Care and Survivorship*. Springer ▪ Sauerland, C. Engelking, C. Wickham, R. Corbi, D. (2006) Vesicant Extravasation Part 1: Mechanisms, Pathogenesis and Nursing Care to Reduce Risk. *Oncology Nurse Forum*. 33(6) 1134-1141 ▪ Mouridsen, HT, Langer,SW. Buter,J. Eidtmann, H. Rosti,G. deWit,m. Knoblauch,p. Rasmussen,A. Dahlstrom, K. Jensen,PB &Giaccone, G. (2007) Treatment of Anthracycline Extravasation with Savene (dexrazoxane): results from two prospective clinical multicentre studies. *Annals of Oncology*. (18)3, P546-550 ▪ The National Extravasation Information Service, www.extravasation.org.uk: accessed Nov 2010 ▪ UKONS. (2007), Oncology Nursing Society: Anthracycline Extravasation Management Guidelines
Training Need Identified?	No

Version Control Table

Date	Version No	Summary of Changes	Changes Made by *(Name and Job Title)*
1999	1.0	Management of Extravasation of cytotoxic drugs	unknown

Feb 2011	2.0	Reviewed, written, updated and put into Trust format	Lisa Nicholls Chemotherapy CNS
Dec 2013	3.0	Reviewed and put into new Trust format	Lisa Nicholls Chemotherapy CNS
Dec 2014	4.0	Updated – new format, flow sheet and Trust	Lisa Nicholls Chemotherapy CNS

Appendix 9. Initial Equality Impact Assessment Form

Name of Name of the strategy / policy /proposal / service function to be assessed (hereafter referred to as *policy*) (Provide brief description): Clinical Guideline for the management in extravasation of cytotoxic drugs in adults	
Directorate and service area: Cancer Services	Is this a new or existing Policy? Existing
Name of individual completing assessment: Lisa Nicholls, CNS	Telephone: 01872 258347
1. Policy Aim* Who is the strategy / policy / proposal / service function aimed at?	To provide clinical staff with clear guidelines on the care of patients who have experienced an extravasation
2. Policy Objectives*	To provide a basis for the nursing care that is required for patients that have experienced an extravasation
3. Policy – intended Outcomes*	Extravasation are treated in a safe manner
4. *How will you measure the outcome?	Monitor DATIX's of chemotherapy Extravasations that occur in the Trust. Collect data with audit tool
5. Who is intended to benefit from the policy?	All staff involved in the giving of chemotherapy and patients that may experience an extravasation
6a) Is consultation required with the workforce, equality groups, local interest groups etc. around this policy? b) If yes, have these *groups been consulted? C). Please list any groups who have been consulted about this procedure.	no

7. The Impact
Please complete the following table.

Are there concerns that the policy **could** have differential impact on:

Equality Strands:	Yes	No	Rationale for Assessment / Existing Evidence
Age		✓	**All patients that have experienced an extravasation will be treated in the same manner**
Sex (male, female, trans-gender / gender reassignment)		✓	**All patients that have experienced an extravasation will be treated in the same manner**

Race / Ethnic communities /groups		✓	**All patients that have experienced an extravasation will be treated in the same manner**
Disability - learning disability, physical disability, sensory impairment and mental health problems		✓	**All patients that have experienced an extravasation will be treated in the same manner**
Religion / other beliefs		✓	**All patients that have experienced an extravasation will be treated in the same manner**
Marriage and civil partnership		✓	**All patients that have experienced an extravasation will be treated in the same manner**
Pregnancy and maternity		✓	**All patients that have experienced an extravasation will be treated in the same manner**
Sexual Orientation, Bisexual, Gay, heterosexual, Lesbian		✓	**All patients that have experienced an extravasation will be treated in the same manner**

You will need to continue to a full Equality Impact Assessment if the following have been highlighted:

- You have ticked "Yes" in any column above and
- No consultation or evidence of there being consultation- this excludes any *policies* which have been identified as not requiring consultation**. or**
- Major service redesign or development

8. Please indicate if a full equality analysis is recommended.	**Yes**	**No** ✓

9. If you are not recommending a Full Impact assessment please explain why.

Signature of policy developer / lead manager / director	Date of completion and submission

Names and signatures of members carrying out the Screening Assessment	1. Lisa Nicholls 2.	

Keep one copy and send a copy to the Human Rights, Equality and Inclusion Lead, c/o Royal Cornwall Hospitals NHS Trust, Human Resources Department, Knowledge Spa, Truro, Cornwall, TR1 3HD

A summary of the results will be published on the Trust's web site.

Signed _____

Date _____