The Christie NHS
NHS Foundation Trust

Management of Extravasation Policy

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Target audience:	All clinical staff involved in the intravenous administration of drugs, in particular chemotherapy.	Equality impact assessment:	01/02/2012

Key points

- Prevention of extravasation
- How to manage an extravasation

CONTENTS

1. ASSOCIATED DOCUMENTS

Cannulation Policy
Medicines Practice Operational Policy

2. INTRODUCTION

2.1 STATEMENT OF INTENT

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

2.2 EQUALITY IMPACT ANALYSIS

As part of its development, this policy was analysed to consider its effect on different groups protected from discrimination by the Equality Act 2010. The requirement is to consider if there any unintended consequences for some groups, and to consider if the policy will be fully effective for all protected groups. This analysis has been undertaken and recorded using the trust's e-tool, and appropriate measures taken to remove barriers or advance equality in the delivery of this policy

2.3 GOOD CORPORATE CITIZEN

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

2.4 THE CHRISTIE COMMITMENT

We aim to reward our staff who are committed and motivated to do their best for patients every day. The trusts principles and behaviours describe what our patients and their families or carers can expect from us, and what our staff can expect from each other.

The trusts behaviours are;
We always give the best quality care
We treat everybody with compassion, dignity and respect
We listen to our patients and each other
We work together as one Christie team
We share knowledge and learning
We support staff to develop to their full potential
We look for new ideas and better ways of working
We promote a fair culture
We provide a safe, clean and tidy environment

All staff are expected to behave in a way that reflects the trusts principles and behaviours.

2.5 PURPOSE

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

2.6 SCOPE

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

3. PREVENTION OF EXTRAVASATION

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

3.1. RISK FACTORS

The risk of extravasation is increased in the following cases:

- Small and fragile veins.
- Cannulation in the antecubital fossa or over joint spaces.
- Patients with a predisposition to bleeding or those with coagulation abnormalities.
- Patients who have had multiple venepuncture or cannulation sites
- Patients who have undergone breast or lymph node surgery
- Decreased sensation or circulation as a result of peripheral neuropathy or diseases such as Raynaud syndrome, advanced diabetes mellitus, severe peripheral vascular disease, or situations such as lymphodema or superior vena cava syndrome.
- Clinical obesity i.e. have a Body Mass Index of >30.
- Prominent but mobile veins.
- Hard and/ or sclerosed veins as a consequence of previous chemotherapy or drug abuse.
- Communication difficulties hindering the early reporting of the signs and symptoms allowing the identification of extravasation. Examples include unconscious, sedated, confused or patients with learning difficulties.
- Inadequate securing of the cannula.
- Inadequate visibility of the cannula site, or for tunnelled devices, the surrounding tissue when administering vesicant and cytotoxic medications
- High flow pressure.
- Elderly patients
- Use of topical anaesthetics may inhibit the detection of an extravasation.

3.2. MANAGEMENT OF RISK

Staff involved in IV administration must ensure that:

- They have the required knowledge and competence to do so safely. Staff must attend the appropriate sessions for their relevant skills e.g. cannulation, reconstitution and administration of drugs.

- Staff must have completed training and been assessed as competent to administer bolus chemotherapy. Staff administering chemotherapy drugs must have received appropriate training and been signed off as competent to do so by a standardised assessor. The practitioner is required to contact an assessor to update their skills as per the chemotherapy administration policy. A register of competent staff and dates for updates is held by the clinical skills team.

- Patients are provided with a clear explanation of the treatment and the possible risk of extravasation, signs of extravasation and how this would be managed should it occur. Patients are given a drug information sheet detailing the risk of extravasation in advance of their treatment. Risk of extravasation should be documented on the patients consent form where appropriate.

- Staff are vigilant and maintain regular dialogue with patients during and post administration

3.2.1. LOCAL TIME RESTRICTIONS

Bolus injection anthracyclines must not routinely be administered after 1800 Monday to Friday (after 1800 the decision to administer is at the discretion of the department manager and must focus on patient safety).

Bolus anthracycline injections can be administered in the Oak Road Treatment Centre on a Saturday between the hours of 8.00 to 18.00 providing that there is adequate medical and pharmacy cover in place.
Anthracycline infusions – less than 24 hour's duration – must be **completed** by 20:00

Anthracycline infusions – 24 hours or longer - must be **commenced** by 1600 to ensure initial monitoring occurs within normal working hours.

4. SIGNS AND SYMPTOMS OF EXTRAVASATION

The administering practitioner must constantly assess the cannulation/tunnelled device site and the surrounding tissue for any signs and symptoms of possible extravasation these may occur immediately after the blood vessel has been breached and may include:

- changes in sensation or pain

- changes in infusion quality (e.g. free flowing IV slowing down)

- swelling at the cannulation site or along the vein pathway

- induration
- erythema
- venous discolouration/blanching
- absence of blood return
- increased resistance when administering IV drugs
- inflammation or blistering

For Central Venous Access Devices (CVADs):

- aching discomfort in the shoulder/neck
- pain, burning, aching/discomfort, swelling of chest wall
- fluid leakage at or around exit site and along subcutaneous canal

5. MANAGEMENT OF EXTRAVASATION

Specific courses of action depend upon:

- the nature of the drug
- how much has extravasated
- the location of the extravasation

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

If extravasation has occurred from a mix of more than one vesicant with both 'disperse and dilute' and 'localise and neutralise' treatment options eg CHOP regimen, then treat as for 'localise and neutral

5.1 PROCEDURE FOR THE IMMEDIATE MANAGEMENT OF EXTRAVASATION (PERIPHERAL OR CENTRAL VIA A CENTRAL VENOUS ACCESS DEVICE)

Step 1
Stop and disconnect bolus/ infusion. **Do not** remove cannula/needle/device
Cap off syringe and/or giving set.

Step 2
Leaving the cannula/needle/ device in place, try to gently aspirate as much of the extravasated solution as possible with a 10ml luer lock syringe. Try to withdraw blood. Record volume in patients notes. Do not apply direct manual pressure to the suspected extravasation site.

Step 3
Explain to patient what you suspect has happened and the procedure for dealing with it.

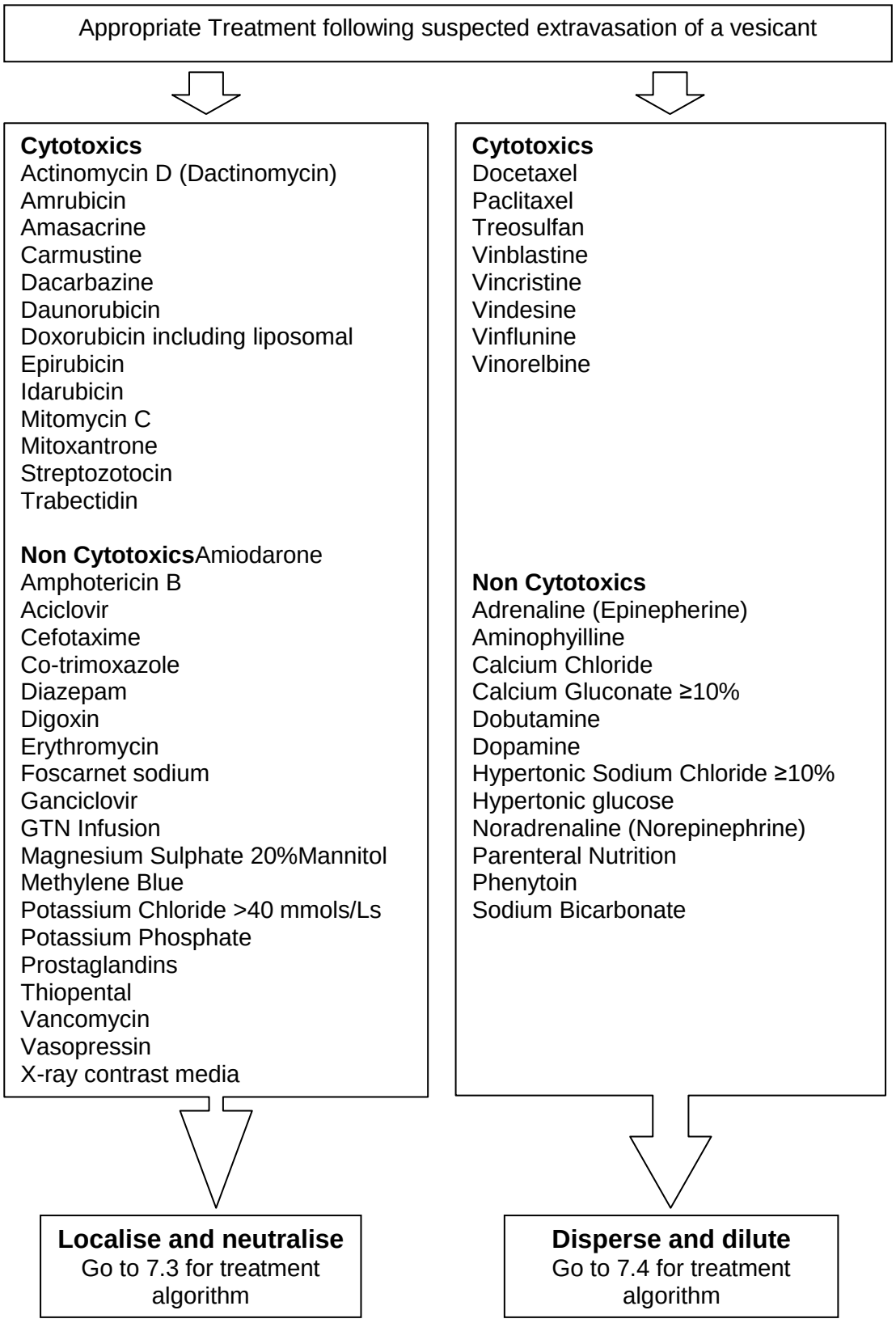
Step 4
Mark the affected area.
For all vesicants drugs (and any others as judged clinically appropriate) request a digital image to be taken by Medical Illustration. For extravasations outside working hours, arrange a digital image to be taken at the earliest opportunity.

Step 5
Remove the cannula/needle.
Collect the extravasation kit.
For CVAD need to contact Procedure Team to arrange removal of device.
Consider advice from plastic surgeons to minimize tissue damage

Step 6
Inform the appropriate clinician and consider seeking advice from senior chemotherapy nurses on the Oak Road Treatment Centre as appropriate.
For all central venous access devices (CVAD): a referral to the plastic surgeons must be considered at the earliest opportunity.

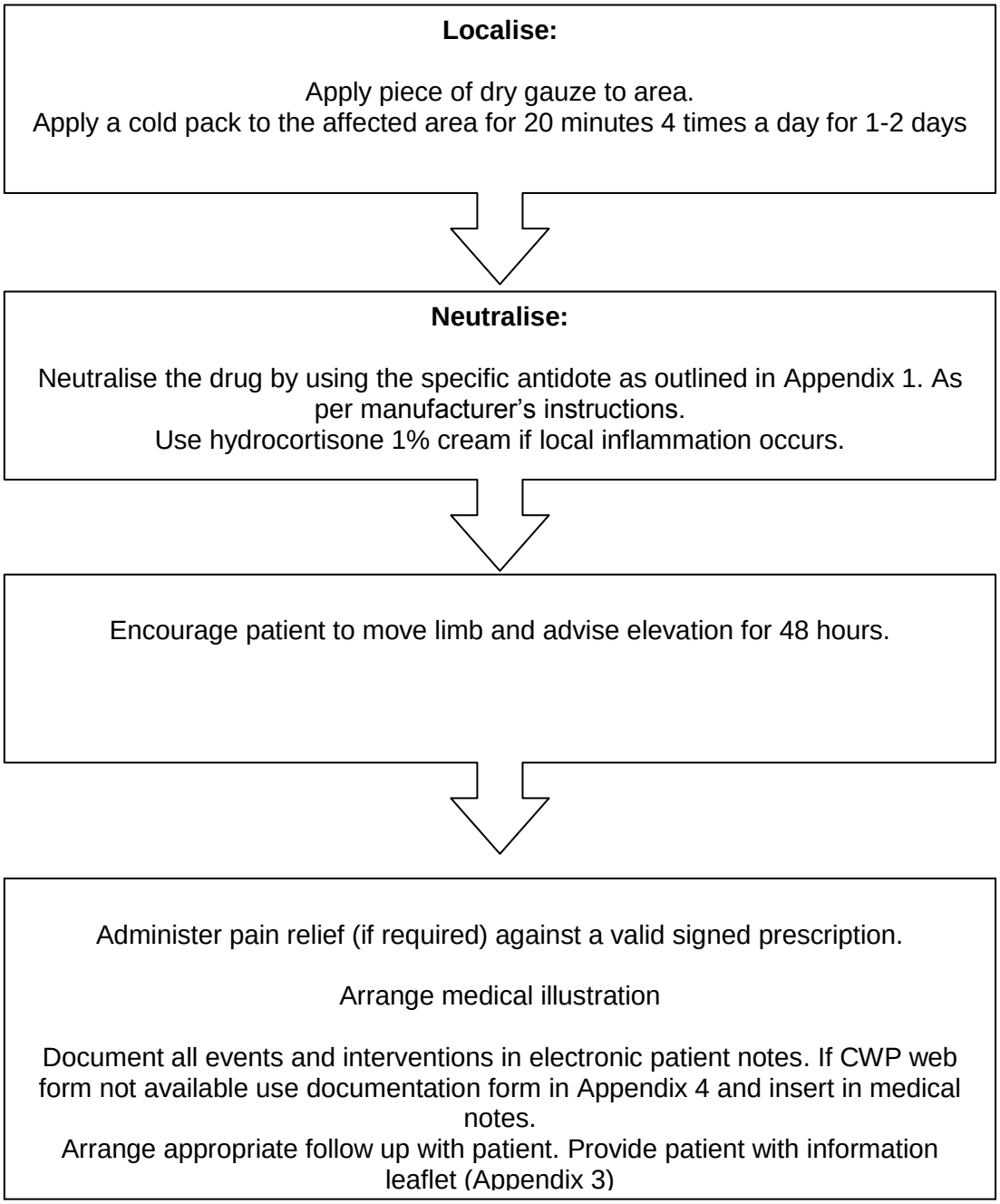
Decide on appropriate treatment based on type of drug extravasated.
Go to 5.2

5.2 APPROPRIATE TREATMENT FOLLOWING A SUSPECTED EXTRAVASATION OF A VESICANT DRUG.

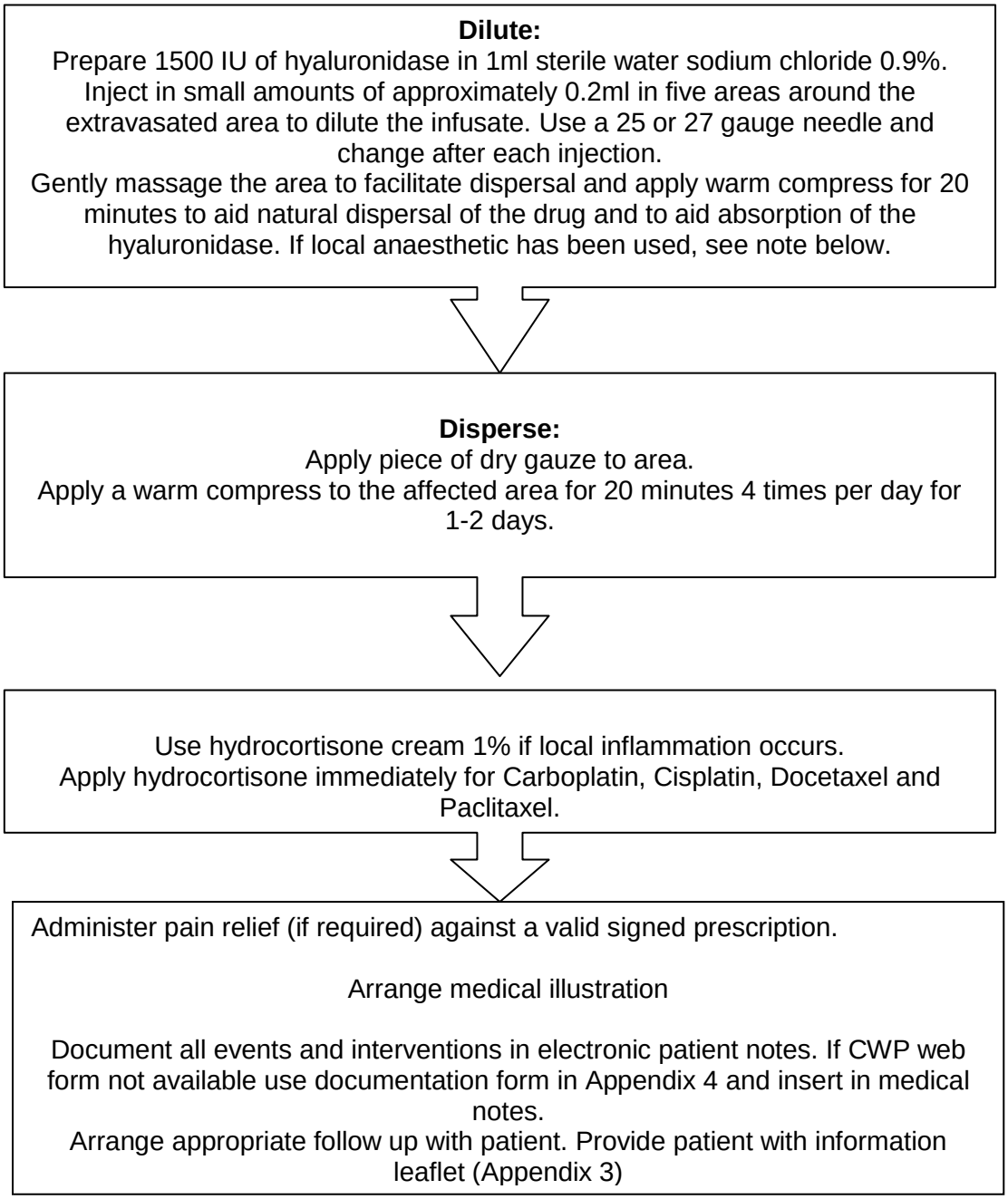


Note: It is the responsibility of the Clinical Trials Pharmacy Team to ensure that unlicensed drugs used in research not identified above, have the appropriate information available in trial protocol for the clinician and nursing staff to administer.

5.3 APPROPRIATE TREATMENT FOLLOWING A SUSPECTED EXTRAVASATION OF A VESICANT DRUG – LOCALISE AND NEUTRALISE ALGORITHM

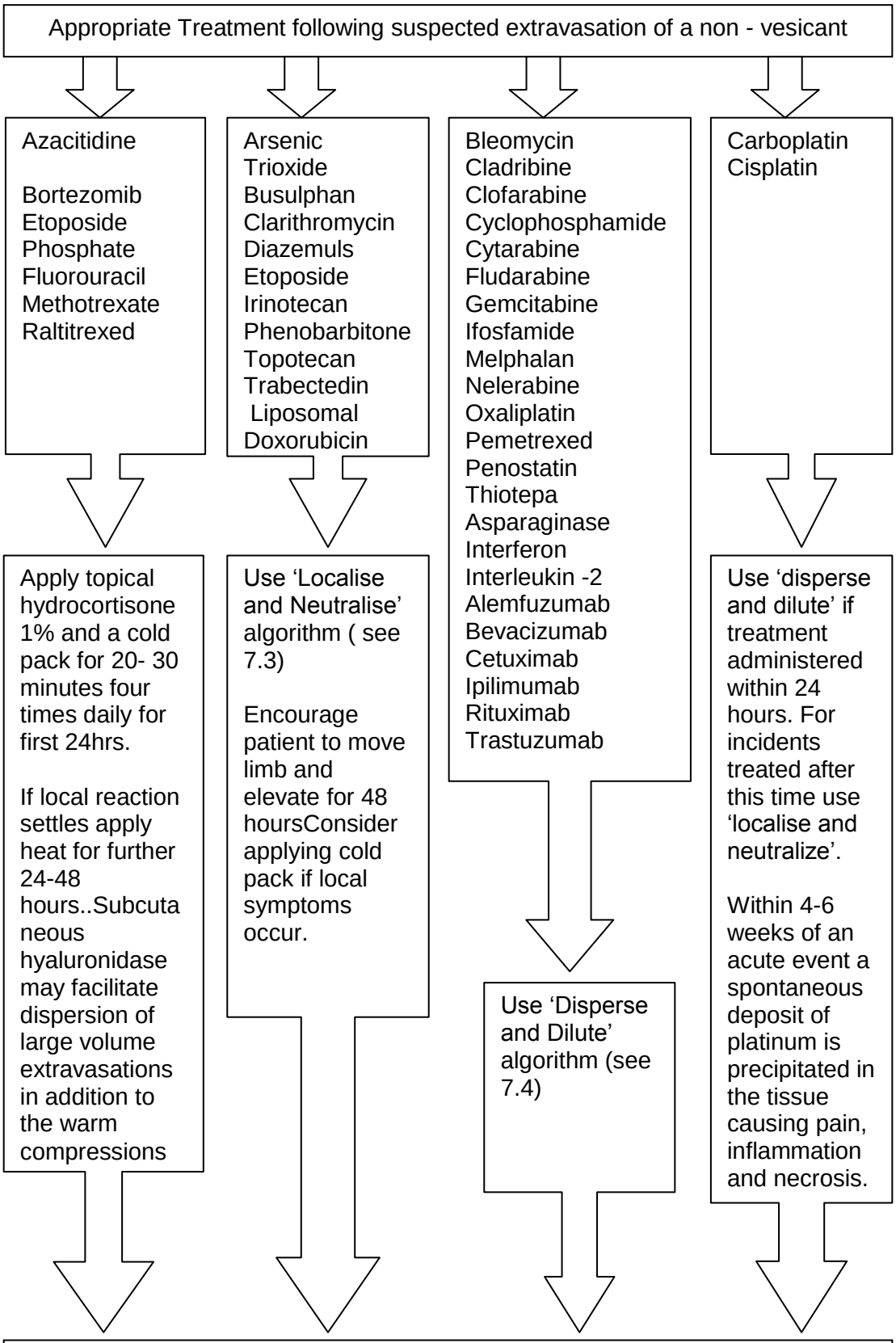


5.4 APPROPRIATE TREATMENT FOLLOWING A SUSPECTED EXTRAVASATION OF A VESICANT DRUG –DILUTE AND DISPERSE ALGORITHM



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

5.5 APPROPRIATE TREATMENT FOLLOWING A SUSPECTED EXTRAVASATION OF A NON- VESICANT DRUG.



5.6. DRUGS NOT LISTED

If patient has had extravasation with an agent not listed in this policy, please contact Aseptics Department for advice, or out of hours contact the on call pharmacist. In general, topical cooling seems to be more effective than topical warming in the management of vesicants.

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

6.0. FOLLOW UP

The patient should be regularly reviewed by the clinical team following an extravasation and daily or alternate day review should be arranged for the week following the incident. The patient should then be reviewed weekly until complete resolution of symptoms. Arrange required follow up out-patient/in-patient appointment and clearly document on the clinical web portal.

All patients with Central Venous Access Device (CVAD) extravasations must return for assessment of the affected area within 48 hours following the extravasation.

Arrange referral to the plastic surgeons in severe cases.

Contact Trust Tissue Viability Nurse or Plastics Dressings Nurse for review and advice if required.

7.0. CONTENTS OF AN EXTRAVASATION KIT

Dimethyl sulfoxide (DMSO/RIMSO 50%-99%)
Hyaluronidase 1500 units
Hydrocortisone cream 1%
Water for injection
Yellow bag for disposal
Luer lock needles
Luer lock syringes 2ml, 5ml, and 10ml
Hot/cold pack
Dressing
Gauze
Non-sterile gloves
Bandage and sling
Safety glasses (optional)
Indelible pen

The kit must be checked each week by ward staff, check to include expiry dates of drugs and equipment. Replacement drugs must be obtained from pharmacy following use. The kit must be stored in a locked treatment room.

8.0. DOCUMENTING AND REPORTING

a) All extravasation incidents must be clearly documented in the patients' medical notes by the practitioner together with details of action taken and follow up appointments made. Where possible the incident should be documented directly on to the clinical web portal, if not accessible then a paper record should be completed and placed in the patients' medical notes (Appendix 4)

b) The extravasation must be reported as a clinical incident on the Trust Datix system. For incidents that occur at a peripheral chemotherapy clinic based at another Trust, the details need to be reported to The Christie Quality and Standards Team.

c) Information documented must include;

- patient name and hospital number
- clinical area
- date and time of extravasation
- name of extravasated drug and volume (approximately)
- signs and symptoms
- description of the IV access including:

    1) site
    2) size and position of cannula
    3) number of attempts at obtaining venous access and positions
    4) drugs administration sequence
    5) technique used and blood return

- description of extravasation area including size and appearance
- Photograph of area if applicable.
- Step-by-step management with the date and time of each step performed and medical notification:

    1) aspiration is possible (volume) or not, location (IV or SC)
    2) cold/heat

3) antidote used (where applicable)

4) referral details

5) Details of any pain relief given.

9.0. CONSULTATION, APPROVAL & RATIFICATION PROCESS

The SACT Delivery Group are responsible for reviewing this policy and will arrange for its update by the Chemotherapy Managers. Pharmacy will review and update the relevant drug related sections of the policy and comments will also be sought from key medical leads. This document requires approval by the Safe Medicines Practice Committee and ratification by the Document Ratification Committee.

10.0. DISSEMINATION & IMPLEMENTATION

10.1 Dissemination

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

10.2 Implementation

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

10.3 Training/Awareness

Nurse training and awareness will be led by the Clinical Skills Team in liaison with Clinical Practice Facilitators for each area. Competencies are completed during intravenous training sessions. This includes theoretical knowledge and practical skills. Staff are required to have annual updates for bolus chemotherapy, reconstitution and administration of intravenous drugs.

11. PROCESS FOR MONITORING EFFECTIVE IMPLEMENTATION

Standard to be monitored	**Process for monitoring** e.g. audit, ongoing evaluation etc.	**Frequency** e.g. annually 3 yearly	**Person responsible for:** undertaking monitoring & developing action plans	**Committee accountable for:** review of results, monitoring action plan & implementation	**Frequency of monitoring** e.g. monthly, quarterly
All areas will be compliant with the policy for managing extravasations	Audit	Annual	Chemotherapy Managers	SACT Delivery Group	Annual
All extravasation incidents to be reviewed.	Ongoing review.	Monthly	Committee Lead	SACT Delivery Group	Monthly

12. REFERENCES

BNF 70 sept 2015

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Fidalgo, P. J. A., Fabregat, G. l., Cervantes, A., Marguiles, A., Vidall, C., Roila, F., (on behalf of the ESMO working group) (2012) Management of chemotherapy extravasation: ESMO-EONS Clinical Practice Guidelines. Annals of Oncology 23 (7) 167-173Hadaway L.C. (2001) Vesicant Extravasation. Nursing 31(8) 88

UK Oncology Nursing Society (2008) *Anthracycline Extravasation Management Guidelines. Anthracycline Extravasation Management Guidelines.* UKONS, London

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13. VERSION CONTROL SHEET

Version	Date	Author	Status	Comment
V01	07/12	Lyn Williams	Final	
V02	05/16	Victoria Burns	Final	Changes to front page Changes to sections 5 to 16.

14. APPENDICES

14.1. APPENDIX 1 : ANTIDOTES

14.1.1. Savene® (Dexrazoxane)

Licensed for treatment of anthracycline extravasation.

Anthracyclines = Daunorubicin, Doxorubicin, Epirubicin and Idarubicin.

Savene is not recommended for liposomal anthracycline extravasation

Savene is a very expensive drug and MUST be recommended by one of the following:

- Chemotherapy Sister (vesicant chemotherapy trained)
- Nurse Practitioner
- Consultant

Savene must be prescribed electronically by a consultant, or under the directions of a consultant and by someone who is authorised to prescribe SACT.

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

The first dose must be initiated within 6 hours of extravasation

Remove cooling 15 minutes prior to administration and do not reapply for 4 hours post administration. Do not use Savene in conjunction with DMSO or steroid treatment.

- **Administration**

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

Day 1 – $1000mg/m^2$ as soon as possible (must be within 6 hours)

Day 2 – $1000mg/m^2$ 24 hours after initial dose +/- 3 hours

Day 3 – $500mg/m^2$ 24 hours after 2^{nd} dose (+/- 3 hours from initial dose)

Notes (See Summary of Product Characteristics for further information)
Not recommended in patients with hepatic or renal impairment

Not recommended in combination with live attenuated vaccines (contraindicated with Yellow Fever Vaccine).

Not recommended in combination with phenytoin.

Potassium and sodium blood levels must be monitored.

Patients on anticoagulants must be monitored daily whilst on dexrazoxane.

Savene is CYTOTOXIC. Haematological toxicity (nadir 11-12 days) may add to that of treatment already received.

Other side effects include nausea and vomiting and raised LFTs

- **Preparation of Savene:**:

Local arrangements for preparation will vary depending on the location of the chemotherapy clinic. Where Savene available on another Trust site then this should be accessed and arrangements made to recharge The Christie. If Savene not available at other peripheral Trust site, the Christie Aseptic pharmacy should be contacted to arrange a supply to be delivered. Due to the short expiry of the drug, the Savene needs to be reconstituted locally using the CareFusion system by the most appropriate person available.

For patients being treated on the main Christie site, via the mobile unit and other Christie outreach nurse led clinics, the preparation arrangements are as follows:

Savene is stored in the Oak Road Treatment Centre Pharmacy, with the on-call room temperature drugs.

Savene will be prepared by Christie pharmacy at the following times:

Monday to Friday – in working hours and on-call up to 8pm
Saturday, Sunday and Bank Holidays on-call from 9am to 8pm

Outside this time, Savene will be provided by the on-call pharmacist, but prepared by the most appropriate person available on duty at the time using the CareFusion system. The individual is deemed to be appropriate if they are a registered nurse, have completed training and been assessed as competent in reconstituting and administering drugs. Seek advice from Duty Manager as required.

The on-call pharmacist will provide support to any member of staff preparing the Savene.

Patients from Christie nurse led clinics and mobile unit should be transported back to the main Christie site for assessment and treatment following a suspected vesicant extravasation. Senior nursing staff in the Outreach Chemotherapy team will liaise directly with the Oak Road Treatment Centre to make arrangements for the assessment and treatment.

14.1.2. DMSO 50-99% (Dimethyl sulphoxide)

Unlicensed indication

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

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

Procedure

a) Draw around the area with indelible pen.

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

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

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

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

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

Notes: Avoid contact with good skin; nursing staff should wear gloves.
If blistering occurs seek medical advice, **DO NOT apply DMSO to blistered skin**.
Avoid intense exposure to sunlight.

Liposomal doxorubicin

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

14.2 APPENDIX 3 PATIENT INFORMATION LEAFLET

The Christie NHS
NHS Foundation Trust

Management of extravasation Patient information leaflet

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

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

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

Daily area check:

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

If **YES** contact The Christie hotline on (0161) 446 3658

Daily assistance:

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

Follow up Appointments:

Date	Time

14.3 APPENDIX 4 EXTRAVASATION DOCUMENTATION

The Christie NHS
NHS Foundation Trust

Management of extravasation

Patient Name……..... Affix Patient Addressograph

Hospital Number……

Date of Birth…….....

Ward……..

Consultant……

Patient address……

Patient contact number……

Extravasation Details

Date…….. Time……..

Site……

Size and position of cannula
……

Number of attempts at obtaining venous access and positions
……

Name of chemotherapy/drug and sequence

……

Regimen……

Bolus/Bag……..

Approximate volume of extravasation (ml)……

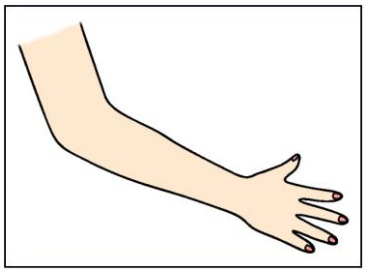
Technique used and blood return
……

……

Patient's signs/symptoms

Burning ☐	Stinging ☐	Pain ☐	Discomfort ☐	Inflammation ☐	Swelling ☐

Other:



Description of extravasation area including size and appearance:

……

……

……

Initial Treatment details:

Cold Pack ☐ Heat Pack ☐

Antidote administered please give details:

……

……

……

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

……

……

……

Photograph taken: Yes/No

Referral details for ongoing care of extravasation
……

……

Name of doctor informed……..

Signature of chemotherapy nurse……..

Continuing assessment details:

Date									
Day post extravasation									
Skin Colour									
Skin Temperature									
Skin Integrity									
Pain									
Oedema									
Fever									
Mobility									
Nurse Initials									

Grading Scale:

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

14.4 APPENDIX 5 EXTRAVASATION AUDIT

The Christie NHS
NHS Foundation Trust

Extravasation Audit Proforma

Ward/Area_____ **Date of Extravasation** _____

Method of administration: CANNULA ☐ CVC ☐ PICC ☐ PORT ☐

1. Was the administration stopped as soon as practitioner became aware of extravasation? Y | N | NA | ND
2. Was the infusion/bolus disconnected? Y | N | NA | ND
3. Was the device left in position? Y | N | NA | ND
4. Was the drug aspirated? Y | N | NA | ND
5. Was the chemotherapy team contacted for advice? Y | N | NA | ND
6. Were the medics informed? Y | N | NA | ND
7. Did the medics attend to review and advise? Y | N | NA | ND
8. Was the area marked with a pen? Y | N | NA | ND
9. Was a photograph taken by medical illustrations? Y | N | NA | ND
10. If the device was a cannula:
    was it removed? Y | N | NA | ND
    was the patient advised to elevate the limb? Y | N | NA | ND
11. If the device was a PICC/CVC/Port were the procedures team contacted? Y | N | NA | ND
12. Was the correct drug management plan followed? Y | N | NA | ND
13. Was pain relief prescribed if required? Y | N | NA | ND
14. If required, were follow up appointments made? Y | N | NA | ND
15. Was the incident documented correctly? Y | N | NA | ND
16. Was the incident reported on Datix? Y | N | NA | ND
17. Were any action plans monitored by the appropriate committee? Y | N | NA | ND

    If NO answered please document reasons below:

Note: please mark answers with a 'x'
ND = Not documented.